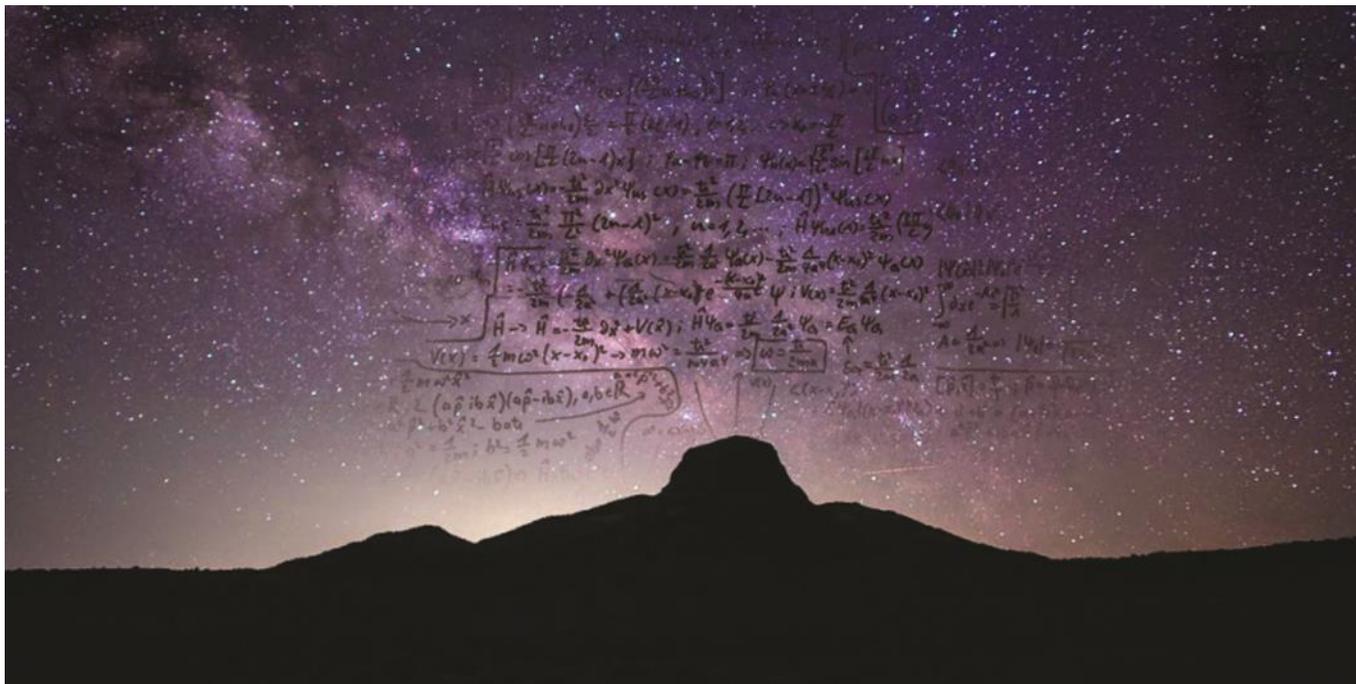June 2019

THE ECONOMIC IMPACT OF
LOS ALAMOS NATIONAL LABORATORY

Prepared for Los Alamos National Labs

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UNM BUREAU OF BUSINESS & ECONOMIC RESEARCH

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Executive Summary

The University of New Mexico's Bureau of Business and Economic Research (BBER) has been commissioned by Los Alamos National Laboratory (LANL) to estimate the economic and fiscal impacts of LANL's operations on northern New Mexico and on the state of New Mexico. This report summarizes the results of the study and outlines the data and methods used in the analysis.

LANL provides substantial economic benefits to Los Alamos County, the six surrounding counties, and the state of New Mexico. It brings out-of-state dollars into New Mexico, provides moderate to high wage jobs to New Mexicans, supports New Mexico businesses and contributes to state and local tax revenues. All LANL revenues are from out-of-state, mostly from Federal dollars. Funding is largely derived from the U.S. Department of Energy (DOE), either directly from DOE or from DOE's National Nuclear Security Administration (NNSA). In FY2017, these externally generated revenues amounted to $2.55 billion going directly into the New Mexico economy.[1]

Nearly three-quarters of LANL's revenues, a total of $1.91 billion, are spent in New Mexico. LANL directly employs 14,754 persons[2], with a total payroll of $1.46 billion[3]. LANL purchases $332.8 million in goods and services and $45.2 million in construction from New Mexico businesses. Additionally, expenditures supported by LANL, including expenditures of its employees and vendors, indirectly creates 9,415 jobs with a combined payroll of $353.6 million, generating $1.21 billion in receipts for New Mexico businesses.

Thus, including both direct and indirect and induced activities, LANL is responsible for the creation of 24,169 jobs, $1.82 billion in labor income, and total revenues of $3.12 billion to businesses in the state. For context, jobs directly and indirectly supported by LANL are nearly equal to the total employment in the state's manufacturing sector (26,398); wages & salaries exceed those of the manufacturing industry by nearly $400 million.

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[1] Congressional Research Service. September 6, 2018. *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*: https://crsreports.congress.gov/product/pdf/R/R45306
[2] Direct employment impacts include 11,882 employed by LANL, including contractors, as well as 2,873 persons employed by vendors and construction contractors engaged by LANL.
[3] The term 'labor income' is equal to wages & salaries, plus benefits, net of federal taxes.

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LANL's Average Annual Economic Impact on the State of New Mexico, FY 2016-2018

Impact Type	Employment	Labor Income	Output
Direct	14,754	1,462,553,134	1,910,517,889
Indirect and Induced	9,415	353,593,366	1,211,148,422
Total Effect	24,169	1,816,146,500	3,121,666,311

Source: UNM Bureau of Business & Economic Research

LANL's economic impacts are concentrated in northern New Mexico, including the seven counties of Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe and Taos. In the study period, 12,690 employees of LANL, with total labor income of $1.34 billion, lived in the seven-county region. Expenditures by LANL and its employees directly generated $1.65 billion in sales for businesses in the region. Including indirect effects, LANL supported 19,122 jobs, $1.57 billion in labor income, and $2.45 billion in business revenues in the seven counties. For context, this is equal to 15% of the total GDP of the seven-county region; the share is certainly far greater in Los Alamos and Rio Arriba counties than in less proximate counties.

The fiscal impacts of LANL on state and local governments are also substantial. Fiscal impacts are the balance of revenues received by state and local governments and expenditures incurred by governments that are charged with providing services such as infrastructure, education and public safety to LANL, its employees, businesses and employees otherwise supported by LANL.

The fiscal impact on state government is net positive. The State receives an estimated $129.4 million in revenues from LANL-supported households and businesses, including personal income taxes (PIT) and gross receipts taxes (GRT), but expends only $117.7 million on State-supported services, including education.

The fiscal impacts for the northern region, on the other hand, are mixed. Counties and municipal governments and other tax-supported entities such as community colleges and school building funds variously receive revenues from GRT and residential and non-residential property taxes, while funding public services that benefit LANL, its employees and those indirectly supported by LANL. In total, governments and public entities in the seven-county region receive $70.8 million in revenues from LANL-supported activities and expend $64.7 million; a net gain of $6 million. However, the distribution is uneven. Counties with a substantial business presence in support of LANL receive high levels of gross receipts taxes, while counties that serve primarily as bedroom communities for LANL employees depend on smaller property tax revenues while funding costly public services to working households.

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This study is based primarily on detailed data provided by LANL. The data include payroll records, including zip code of residence, and nearly 625,000 expenditure records, detailed by industrial sector and zip code. The data provided by LANL are inclusive of federal fiscal years 2016-2018; values were averaged and adjusted to FY2017 values by BBER. These data account for direct economic impacts. BBER utilized IMPLAN, a widely-used economic impact modeling package, to estimate indirect and induced economic impacts. BBER estimated fiscal impacts by combining results of the economic impact analysis with publicly-available records maintained by the New Mexico Taxation and Revenue Department and the Local Government Division of the state's Department of Finance and Administration.

1. Introduction

The University of New Mexico's Bureau of Business and Economic Research (BBER) has been commissioned by Los Alamos National Laboratory (LANL) to estimate the economic and fiscal impacts of LANL's operations on northern New Mexico and the state. This report presents the results of the study and outlines the data and methods used to arrive at these results.

The report estimates the full impact of LANL – both direct and indirect – on the economy of New Mexico. Most of the economic activity in New Mexico is in the form of direct business expenditures by LANL and household spending by its employees. Additionally, these direct expenditures generate indirect and induced impacts on the state's economy, as expenditures of LANL's vendors and businesses supported by LANL's employees circulate through the state economy. In this report, impacts are measured in terms of jobs, wages & salaries, and output.

Economic impact analysis includes estimations of economic activity funded by dollars brought into the region by LANL. Analyses include impacts that occur within the state of New Mexico as a whole and more narrowly in northern New Mexico, a seven-county area consisting of Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe and Taos counties. Conceptually, economic impacts can be understood as the difference between the state and regional economies with and without LANL. This is a comparative static analysis. While LANL programs have a long-term impact on the economy, this analysis is not an attempt to measure the dynamic impact of those programs or their associated technological innovations.

LANL is operated by Triad National Security, LLC, a limited liability company consisting of Battelle Memorial Institute, the Regents of the University of California and the Regents of Texas A&M University. Triad National Security LLC became the operator of LANL for the Department of Energy's National Nuclear Security Administration (NNSA) in 2018.[4] All revenues supporting the LANL budget come from out-of-state sources, primarily from NNSA. In FY2017, revenues totaled $2.55 billion.[5]

In 2017, LANL supported the employment 14,754 persons with a total payroll including benefits of $1.46 billion. Direct expenditures by LANL and its employees generated $1.91 billion in sales to New Mexico businesses. Including

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[4] LANL. June 8, 2018. *NNSA awards Los Alamos National Laboratory management & operating contract*: https://www.lanl.gov/discover/news-stories-archive/2018/June/0608-new-contractor.php.
[5] Congressional Research Service. September 6, 2018. *The U.S. Nuclear Weapons Complex: Overview of Department of Energy Sites*: https://crsreports.congress.gov/product/pdf/R/R45306

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indirect and induced effects that flow from the expenditures of LANL and its employees and vendors. LANL supported 24,169 jobs, $1.82 billion in labor income, and $3.12 billion in output.

The economic impacts of LANL spending are concentrated in northern New Mexico. In the study period, 12,690 employees of LANL, with total labor income of $1.34 billion, lived in the seven-county region. Expenditures by LANL and its employees directly generated $1.65 billion in sales for businesses in the region. Including indirect effects, LANL supported 19,122 jobs, $1.57 billion in labor income, and $2.45 billion in business revenues in the seven counties. For context, this is equal to 15% of the total GDP of the seven-county region; the share is certainly much greater in Los Alamos and Rio Arriba counties.

The impact of LANL on the balance sheets of state and local governments and other publicly-funded entities is also substantial. In FY2017, LANL, its employees and vendors paid an estimated $214.2 million in taxes, including $129.4 million gross receipts taxes (GRT) and personal income taxes (PIT) to the State of New Mexico and $70.8 million in GRT and property taxes to governments in the seven-county region. In turn, state and local governments provided an estimated $186.9 million in services to LANL, its employees and vendors, including infrastructure, education, public safety and health. The distribution of revenues and expenditures is uneven.

In addition, LANL is committed to strengthening the northern New Mexico region through economic development and educational program initiatives. Along with stimulating business growth and promoting education through scholarships and other directives, LANL facilitates opportunities for former and current employees to volunteer in the community. Since 2006, 1.8 million volunteer hours of non-profit service have been logged.[6] The rest of the report is organized as follows:

- Section 2 briefly discusses the context of LANL within the Department of Energy National Laboratories.

- Section 3 discusses, data sources, methodology and BBER's modeling of LANL economic impacts using IMPLAN.

- Section 4 presents the results of the analysis, including the economic impacts of LANL activities on northern New Mexico counties and municipalities as well as in the state.

- Section 5 estimates the fiscal impacts of LANL in those same geographies with focus on Gross Receipts Taxes (GRT), property taxes and personal income tax (PIT).

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[6] LANL. *Community:* https://www.lanl.gov/community/

- Section 6 provides an overall assessment of the economic and fiscal impacts of LANL.

2. Department of Energy National Laboratories in the U.S. and New Mexico

New Mexico is home to two of the 17 national laboratories currently under the auspices of the U.S. Department of Energy (DOE) – Los Alamos National Laboratory and Sandia National Laboratories (SNL). Both national laboratories conduct scientific research and development operations in areas related to energy and technology. Individually and collectively, the 17 National Labs are responsible for advancements in the areas of nuclear energy, science and weapons research, in accordance with the mission of DOE.

The 17 DOE laboratories make up the federal research system. Together, the laboratories apply complex, often multidisciplinary, methodologies to inquiries in science and technology that are beyond the scope of academic and industrial institutions. Each lab contributes to fulfill unique obligations to the U.S. government.[7]

Three of the Labs are National Nuclear Security Administration (NNSA) facilities. LANL and SNL are two of those Labs. NNSA is a semi-autonomous branch of DOE with duties that include maintaining the safety of U.S. nuclear stockpiles and assisting to curtail global nuclear threats.[8]

LANL is a multidisciplinary laboratory with a prime responsibility of "maintaining the safety, security and reliability of the nation's nuclear deterrent without the need to return to underground testing."[9] LANL also works on nuclear nonproliferation, border and infrastructure security, energy and countermeasures to nuclear and biological terrorist threats. As a foundation, the laboratory conducts fundamental science in: high-energy and applied physics and theory, high-performance computing, dynamic and energetic materials science, superconductivity, quantum information, advanced materials, bioinformatics, theoretical and computational biology, chemistry, earth and environmental science, energy and infrastructure security, engineering sciences and applications and nanotechnology.

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[7] DOE, Office of Science. 2015. *The DOE Laboratory System*: https://science.energy.gov/laboratories/.
[8] DOE, NNSA. *About NNSA*: https://www.energy.gov/nnsa/about-nnsa.
[9] LANL. *Our History*: https://www.lanl.gov/about/history-innovation/.

In 2017, DOE funded nearly $5.7 billion nationally for research in the energy, nuclear, physical, material, chemical and biological sciences.[10] Most of the funding received by LANL originates from these contributions which are external to New Mexico. Thus, revenues used by LANL to pay its employees, purchase goods and services or to finance construction projects in New Mexico are treated as economic impacts.

3. Study Methodology

The purpose of this study is to estimate the direct and indirect impact of LANL on the economy of New Mexico and the seven-county region neighboring its facilities. Impacts are measured in terms of employment, labor income and output (revenues to businesses plus/minus changes to inventory). Direct employment is the number of persons employed by LANL living in New Mexico.[11] Labor income is wages & salaries and benefits, minus federal taxes paid to LANL employees.Output includes in-state expenditures by LANL and its employees.

Indirect economic impacts are the subsequent effects of business-to-business spending. These include impacts of in-state purchases of LANL's vendors and employees, again measured in terms of employment, labor income and output. Induced economic impacts are subsequent effects of employee spending, beginning with spending of employees of vendors to LANL and LANL's employees. In effect, the indirect and induced impacts measure the effects of the direct spending as money is cycled through the economy. Throughout this report, indirect and induced effects are summarized as indirect effects. The multiplier is an estimate of the indirect and induced impacts; additional jobs, incomes and revenues that flow from the initial direct expenditure.

This economic impact analysis is accomplished in three main steps: First, the industry of interest is defined in terms of standard classification methods. In this case, the industrial sector definitions provided by the North American Industry Classification System (NAICS) are used. Second, the direct activities of the industry, as defined in step one, are tabulated. This is the measure of employment, employee compensation and the value of the output provided by LANL itself. Finally, impact analysis estimates the indirect and induced impacts of LANL in other sectors of the economy. The study also captures the multiplier

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[10] DOE. *FY 2017 Department of Energy Budget Request Fact Sheet*: https://www.energy.gov/fy-2017-department-energy-budget-request-fact-sheet.

[11] Direct employment includes three groups of employees who live in New Mexico – 9,411 non-union employees; 1,747 craft employees (unionized carpenters, electricians, ironworkers, masons, operating engineers, pipefitters and others); and 724 contract employees who provide security and transportation services.

effect for each additional unit of employment, employee compensation and output.

In this study, impacts are estimated for two geographies: First, impacts are estimated for New Mexico as a whole. Purchases by LANL, its employees and vendors (and their vendors) in any county of the state are included. Second, impacts are estimated for the seven-county region, which as noted includes, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe and Taos counties. In this case, purchases of LANL, its employees and vendors that occur anywhere within the region are included. Purchases made in New Mexico but not in the seven-counties are excluded from that estimation. Note that BBER does not attempt to estimate impacts for individual counties, and attempts to impute impacts to individual counties would introduce significant errors.[12]

BBER uses the IMPLAN v3.1 model and proprietary databases to calculate the indirect and induced impacts of LANL operations. IMPLAN is widely used in regional economic modeling for estimating economic impacts.[13] BBER created impact models with the IMPLAN v3.1 datasets – statewide and seven-county – then modeled by geography to estimate the impacts of LANL's purchases of goods and services, construction, and household spending by LANL employees. IMPLAN impact models are based on detailed information about the flow of dollars and local economic interactions within a specific geographic area, or region, providing region-specific multipliers to calculate economic impacts based on consumer and business spending patterns. Because more than three-quarters of LANL's direct expenditures are from payroll and salaries of LANL employees are substantially higher than regional and statewide averages, using household spending allows for significantly more accurate estimates.

3.1 Data and Data Sources

This study is based primarily on detailed data provided by LANL. The data include individual level payroll and procurement of goods and services for federal fiscal years 2016 through 2018. Payroll data included employee counts by zip code for 9,411 LANL employees; 1,747 craft employees (unionized carpenters, electricians, ironworkers, masons, operating engineers, pipefitters and others), and 724 contract employees who provide security and transportation services.

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[12] The sum of estimates of impacts for each of seven individual counties would be significantly lower than the estimate of impacts for the seven-county region as a whole. For example, purchases in Santa Fe by persons living in Los Alamos would not be included in either the Santa Fe analysis (revenues originate outside the county) nor the Los Alamos analysis (revenues left in the county) but would be included in the single seven-county analysis (both Los Alamos and Santa Fe are in the single region).
[13] http://www.implan.com/.

BBER adjusted wages & salaries to include benefits[14], and federal tax payments were estimated and deducted.[15] Payroll data were adjusted to FY2017 values[16] and averaged.

Procurement data included 624,530 records of purchases over the three period, detailed by 6-digit NAICS codes and vendor zip codes. BBER converted NAICS codes to IMPLAN codes for modeling. Data were adjusted to FY2017 values and averaged. Thus, results are, in almost all cases three-year averages reported in 2017 dollar values.[17]

3.2 Economic Impact Estimation Model

The combined effects of LANL on the state economy are greater than the sum of LANL total spending on employee compensation, goods and services and capital improvement projects. This is because money spent by LANL on salaries and goods and services is spent again by their employees and vendors.

Direct Impact = (% Non-local Revenues) X (% Local Expenditures) X (Total Expenditures)

The above equation indicates that direct impacts are created when funds flow into the state and then are cycled within the local (state) economy. In this study, BBER assumes that all LANL revenues are from out-of-state, Federal, sources.

The input-output multipliers are computed using IMPLAN v3.1. These multipliers are then applied to estimate the indirect and induced impacts on the New Mexico economy. 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).

3.3 Fiscal Impact Estimation Method

Fiscal impacts are the balance of revenues and expenditures of state and local government that are attributable to LANL. These may include revenues directly attributable to LANL, such as taxes on purchases made by LANL, personal income taxes and taxes on household purchases of employees of LANL, as well as taxes paid by businesses and employees of vendors to LANL and its employees.

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[14] Cost of benefits, provided by LANL, were 42.4% for LANL and craft employees. Contract employee data included benefits provided by COMPA, the labor contractor.
[15] Deflators were BEA national CPI rates, 1.6% in FY 2017; and 1.9% in FY 2018.
[16] Deflators were BEA national CPI rates, 1.6% in FY 2017; and 1.9% in FY 2018.
[17] These data are summarized in **Table 9**.

Fiscal analysis follows from economic impact analysis. Economic impact analysis provides estimates of incomes and sales as they cycle and multiply through the economy, and fiscal analysis tracks these incomes and applies effective tax rates as necessary. Thus, fiscal analysis considers not only direct impacts (e.g., GRT on vendors to LANL) but also indirect impacts (e.g., taxes on induced sales to vendors and their employees).

In New Mexico, fiscal revenues derive from three sources. Personal income taxes (PIT) are collected by the State; rates are a function of household income. Gross receipts taxes (GRT) are effectively sales taxes collected on all eligible transactions and are shared by state and local governments. Finally, residential and non-residential property taxes are collected primarily by local governments. In New Mexico, State government depends relatively equally on PIT and GRT. Local governments are somewhat more dependent on GRT, as property tax rates are based on relatively low estimates of property values.

As noted, economic impact analysis provides the foundation for fiscal analysis. The second elements are effective PIT, GRT and property tax rates provided by the New Mexico Taxation and Revenue Department (TRD) and the Local Government Division of the state's Department of Finance and Administration (DFA). PIT rates are based on a schedule of effective tax rates provided by TRD. TRD provided BBER with average PIT payments by household income, as reported to the IRS. GRT rates are effective rates (gross receipt tax payments as a percentage of total gross receipts) disaggregated by industry code and tax district. Thus, the analysis reflects differences from one municipality or county to another, and from one product to another. Finally, residential and non-residential property tax rates are based on Property Tax Certificates for each tax jurisdiction, as provided by DFA Local Government Division. Note that while economic impact analysis is limited to the seven-county area in aggregate, the availability of data on the residence of employees allows for more detailed, county-level analysis of fiscal impacts.

Government expenditures are allocated according to household population. LANL employment impact is estimated in the economic analysis. It is assumed that each employee is a head of household. Government expenditures attributed to LANL are proportionate to the number of employees as a share of total households. This may result in an over-estimate for two reasons: it is likely that two or more LANL employees may occupy a single household, and it is likely that costs of public services to households of well-paid LANL employees may be less than average. However, these impacts are likely, at least partially, offset because the analysis does not incorporate any estimate of costs associated with LANL and its vendors.

4. Economic Impacts of LANL on the State and Northern New Mexico

4.1 Statewide Economic Impacts

LANL's impacts on New Mexico's economy is summarized in **Table 1**.

In FY2017 Federal, out-of-state revenues to LANL were approximately $2.55 billion. Nearly three-quarters of LANL's revenues, a total of $1.91 billion, were spent in New Mexico. LANL supported the employment 14,754 persons in the state, with a payroll of $1.46 billion. Additionally, LANL purchased $332.8 million in goods and services and $45.2 million in construction from New Mexico businesses.

Beyond these initial direct expenditures, spending by LANL's employees and vendors indirectly supported 9,415 jobs with a combined payroll of $353.6 million, generating $1.21 billion in receipts for New Mexico businesses.

Thus, including both direct and indirect and induced activities, LANL is responsible for the creation of 24,169 jobs, $1.82 billion in labor income, and total revenues of $3.12 billion to businesses in the state. For context, jobs directly and indirectly supported by LANL are nearly equal to total employment in the state's manufacturing sector (26,398); wages & salaries exceed those of the manufacturing industry by nearly $400 million.

Table 1. Total Economic Impacts, Statewide

Impact Type	Employment	Labor Income	Output
Direct	14,754	1,462,553,134	1,910,517,889
Indirect and Induced	9,415	353,593,366	1,211,148,422
Total Effect	24,169	1,816,146,500	3,121,666,311
Multiplier	1.64	1.24	1.63

Source: UNM Bureau of Business and Economic Research, Los Alamos National Laboratory

Tables 2, **3** and **4** detail these total impacts by category, reflecting the channels through which federal revenues to LANL flow into New Mexico's economy. These include in-state household spending of LANL employees, and LANL's in-state procurement of goods and services and construction contracting, respectively.

As a research facility, the majority of LANL's expenditures in New Mexico are channeled through wages & salaries and thus household expenditures of its

employees (**Table 2**). LANL supports the employment of 11,882 persons with a labor income of $1.34 billion, an average of $112,386 per employee. LANL's payroll accounts for 80% of the total direct employment impact, and 91% of direct labor income. Additionally, the household expenditures of LANL employees indirectly support another 7,790 jobs, with a total labor income of $288.4 million. The total impact of household expenditures of LANL employees, both direct and indirect, is $2.52 billion, 80.9% of LANL's total impact in the state.

Table 2. Economic Impacts of LANL Employee Household Spending, Statewide

Impact Type	Employment	Labor Income	Output
Direct	11,882	1,335,372,695	1,532,518,459
Indirect and Induced	7,790	288,449,873	992,110,906
Total Effect	19,671	1,623,822,568	2,524,629,365
Multiplier	1.66	1.22	1.65

Source: UNM Bureau of Business and Economic Research, Los Alamos National Laboratory

LANL's procurement of goods and services supports 2,491 jobs in New Mexico, with a total in-state labor income of $109.8 million (**Table 3**). Procurement directly accounts for $332.8 million in sales for New Mexican businesses. In turn, procurement of LANL's in-state vendors generates an additional $194.1 million in sales. In total, LANL's purchase of goods and services from New Mexican businesses supports 3,947 jobs, $167.9 million in labor income, and $526.9 million in sales.

Table 3. Economic Impacts of LANL Purchases of Goods and Services, Statewide

Impact Type	Employment	Labor Income	Output
Direct	2,491	109,806,897	332,808,565
Indirect and Induced	1,456	58,171,051	194,105,795
Total Effect	3,947	167,977,948	526,914,360
Multiplier	1.58	1.53	1.58

Source: UNM Bureau of Business and Economic Research, Los Alamos National Laboratory

Finally, LANL's construction contracts directly support 382 jobs, $17.4 million in labor income and $45.2 million in sales in New Mexico (**Table 4**). Together with indirect and induced impacts associated with expenditures by contractors and their employees, LANL's construction activities support 551 jobs, $24.3 million in labor income, and $70.1 million in sales. Note that these data are annual averages for the period FY2016 – FY2018. By its nature, construction tends to vary significantly over time.

Table 4. Economic Impacts of LANL Spending on Construction, Statewide

Impact Type	Employment	Labor Income	Output
Direct	382	17,373,542	45,190,865
Indirect and Induced	169	6,972,442	24,931,721
Total Effect	551	24,345,984	70,122,586
Multiplier	1.44	1.40	1.55

Source: UNM Bureau of Business and Economic Research, Los Alamos National Laboratory

4.2 Seven-County Economic Impacts

LANL's economic impact in New Mexico is largely concentrated in a seven-county region in northern New Mexico, which includes Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe and Taos counties. Directly and indirectly, LANL's operations support 19,122 jobs in the region, equal to 79% of the statewide total, with a total payroll of $1.57 billion, more than 86% of the state total (**Table 5**). In total, LANL generates $2.45 billion in sales for businesses in northern New Mexico, the equivalent of 15% of the gross product of the seven-county region. To be sure, the weight of LANL's impact is still greater in the smaller and nearer communities, including Los Alamos and Rio Arriba counties.

Table 5. Total Economic Impacts, Seven-County Region

Impact Type	Employment	Labor Income	Output
Direct	12,690	1,342,364,382	1,649,516,969
Indirect and Induced	6,433	228,121,448	798,229,031
Total Effect	19,122	1,570,485,830	2,447,746,000
Multiplier	1.51	1.17	1.48

Source: UNM Bureau of Business & Economic Research, Los Alamos National Laboratory

As noted, LANL impacts New Mexico's economy primarily through its payroll and, in turn, the household expenditures of its employees. Naturally, most employees live and spend in communities neighboring LANL, in particular the seven-county area of northern New Mexico. More than 91% of in-state LANL employees (10,833) live in the seven-county region, and more than 94% of the direct impact of their spending on the state economy is concentrated in the region ($1.26 billion; **Table 6**).[18] While some of these expenditures leak to other communities in the state, the indirect and induced impacts of LANL employee spending on the economy of northern New Mexico is also significant. Household expenditures by LANL employees indirectly support 5,752 jobs, with $203.3 million in labor income, generating $711.9 million in sales in northern New Mexico.

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[18] See Appendices 3 and 4 for county detail of LANL's payroll.

Table 6. **Economic Impacts of LANL Employee Household Spending, Seven-County Region**

Impact Type	Employment	Labor Income	Output
Direct	10,833	1,260,810,702	1,446,948,618
Indirect and Induced	5,752	203,292,390	711,916,454
Total Effect	16,585	1,464,103,092	2,158,865,072
Multiplier	1.53	1.16	1.49

Source: UNM Bureau of Business & Economic Research, Los Alamos National Laboratory

The impacts of LANL's procurement of goods and services and construction contracting is somewhat less concentrated in the region, with a share entering the more distant but economically more diversified Albuquerque Metropolitan area. As shown in **Tables 7** and **8**, procurement of goods and services and construction supports a total of 2,228 and 310 jobs in the seven-county area, in each case 56% of related jobs in New Mexico. LANL's procurement directly and indirectly results in $253 million and $35.9 million in sales for local businesses, equal to 48% of statewide impacts associated with the procurement of goods and services and 51% of impact associated with construction.

Table 7. **Economic Impacts of LANL Purchases of Goods and Services, Seven-County Region**

Impact Type	Employment	Labor Income	Output
Direct	1,615	72,099,763	175,728,169
Indirect and Induced	613	22,266,348	77,230,935
Total Effect	2,228	94,366,111	252,959,104
Multiplier	1.38	1.31	1.44

Source: UNM Bureau of Business & Economic Research, Los Alamos National Laboratory

As seen in **Table 8**, LANL's impact from 2017 construction expenditures in the seven-county region were similarly non-trivial. A total of 310 new jobs were created from that spending. Workers received an additional $12 million in wages, creating an overall output of $35,921,824 for the area. In 2017, LANL expenditures for goods, services and construction in the seven-county region contributed almost $289 million that would not have otherwise occurred.

Table 8. Economic Impacts of LANL Spending on Construction, Seven-County Region

Impact Type	Employment	Labor Income	Output
Direct	242	9,453,917	26,840,182
Indirect and Induced	68	2,562,710	9,081,642
Total Effect	310	12,016,627	35,921,824
Multiplier	1.28	1.27	1.34

Source: UNM Bureau of Business & Economic Research, Los Alamos National Laboratory

4.3 Impacts of LANL Procurement of Goods and Services and Construction, by Industry

Table 9 details LANL's procurement of goods and services and construction for the study period by industry and for select geographies, including Los Alamos, Santa Fe, Bernalillo counties, the seven-county region, the state of New Mexico as well as out-of-state purchases. The final column indicates the share of expenditures in New Mexico.

Over the 3-year period, LANL expended an average of $752.6 million on the procurement of goods and services and construction. Just over one-half of the purchases were of New Mexico-based businesses ($378 million). Of the expenditures in New Mexico, nearly half were purchases of businesses located in Bernalillo County ($175.4 million), the economic center of the state, and most of the balance of businesses located in Los Alamos ($135.3 million) and Santa Fe counties ($66.7 million).

Industrial patterns of these purchases offer a useful insight into LANL's procurement practices and their impacts on New Mexico businesses. Note, first, the majority of LANL's out-of-state purchases are for manufactured goods-computer and electronic goods in particular. LANL also procured significant professional, scientific and technical services from out-of-state vendors. Additionally, LANL made substantial in-state expenditures on manufactured goods, most from firms located in Bernalillo County, and professional, scientific and technical services, mostly located in Los Alamos, Bernalillo and Santa Fe counties. New Mexico firms were heavily favored in large contracts for administrative and construction services, the majority of which went to firms located in Los Alamos and Santa Fe counties.

Table 9. LANL Procurement of Goods and Services and Construction by Industry and Select Geography, FY2017

Industry	Los Alamos	Santa Fe	7-County	Bernalillo	New Mexico	Out Of State	Grand Total	NM % Total
Agriculture		2,485	3,051	24,938	27,989	68,022	96,011	**29%**
Mining		706,152	706,152	52,978	759,130	110,356	869,486	**87%**
Utilities	4,550,999	1,584	4,561,646	468,469	5,030,115	545,086	5,575,201	**90%**
Construction	7,447,706	19,391,007	26,840,182	18,350,682	45,190,864	16,607,949	61,798,813	**73%**
Construction of Buildings	2,238,535	9,696,919	11,935,455	7,044,049	18,979,504	6,113,723	25,093,227	76%
Heavy and Civil Engineering Construction	1,287,651	6,824,027	8,111,678	3,967,654	12,079,332	4,861,329	16,940,661	71%
Specialty Trade Contractors	3,921,520	2,870,061	6,793,694	8,361,705	14,155,398	5,609,527	19,764,925	72%
Manufacturing	15,602,607	13,877,387	29,479,994	86,879,492	116,359,486	224,147,187	340,506,673	**34%**
Computer & Electronic Manufacturing	23,733,479	17,909,844	41,746,607	18,340,421	60,087,028	120,590,667	180,677,696	33%
Fabricated Metal Product Manufacturing	288,317	479,699	774,660	8,934,307	9,708,967	21,579,416	31,288,383	31%
Machinery Manufacturing	4,166,701	418,363	4,586,410	4,008,436	8,594,846	24,324,288	32,919,134	26%
Miscellaneous Manufacturing	6,969,352	4,510,354	11,621,266	16,236,024	27,857,289	37,417,808	65,275,097	43%
Transportation and Warehousing	-	10,534	10,534	52,715	63,249	162,808	226,057	**28%**
Information	3,390,484	4,877,822	8,358,888	2,769,233	11,128,121	32,563,872	43,691,993	**25%**
Finance and Insurance			-	2,039,485	2,039,485	97,152	2,136,637	**95%**
Real Estate and Rental and Leasing	7,520,705	1,885,467	9,407,114	3,133,634	12,540,748	1,526,290	14,067,038	**89%**
Professional, Scientific, and Technical	30,889,257	12,255,878	43,220,221	24,405,716	67,625,937	59,054,663	126,680,600	**53%**
Admin. and Waste Mgt & Remediation	64,918,102	12,753,762	78,017,616	33,291,809	111,309,425	19,783,955	131,093,380	**85%**
Administrative and Support Services	52,250,007	8,901,809	61,429,709	30,392,443	91,822,152	16,347,477	108,169,629	85%
Waste Mgt & Remediation Services	12,668,095	3,851,953	16,590,960	2,966,282	19,557,243	3,366,508	22,923,751	85%
Educational Services	23,553	201,410	239,174	1,480,261	1,719,435	10,088,733	11,808,168	**15%**
Health Care and Social Assistance	139,400	48,570	187,970	31,358	219,328	325,112	544,440	**40%**
Arts, Entertainment, and Recreation	12		12	0	12	6,611	6,623	**0%**
Accommodations & Food Services	555,962	77,636	660,614	198,686	859,300	62,081	921,381	**93%**
Other Services	251,500	623,262	875,183	2,251,585	3,126,768	6,803,352	9,930,120	**31%**
Public Administration	-	-	-	29	29	2,618,898	2,618,927	**0%**
Grand Total	135,290,288	66,712,956	202,568,351	175,431,070	377,999,421	374,572,128	752,571,549	**50%**

Source: LANL, UNM Bureau of Business & Economic Research

In addition to sales of goods and services and construction, LANL's procurements generate indirect impacts as dollars circulate within the state and regional economy. These impacts are summarized by industry for the state as a whole and the seven-county region in **Tables 10** and **11**. Note in particular these secondary impacts in wholesale and retail trade, health and educational services, leisure and hospitality, and other services, which occur as employees of firms that provide professional and administrative services to LANL purchase goods and services for their households.

Table 10. Impacts of Goods and Services and Construction Expenditures, Statewide by Industry, FY2017

Industry	Direct	Indirect	Total
Agriculture, Mining, Utilities	$5,817,234	$9,726,720	$15,543,954
Construction	$45,190,864	$3,507,501	$48,698,365
Manufacturing	$116,359,486	$9,751,758	$126,111,244
Wholesale & Retail Trade	$0	$27,723,489	$27,723,489
Transportation	$63,249	$8,793,560	$8,856,809
Information	$11,128,121	$12,666,013	$23,794,134
Financial Activities	$14,580,233	$58,631,816	$73,212,049
Prof, Scientific and Technical Services	$67,625,937	$19,097,385	$86,723,322
Management of Companies	$0	$4,502,791	$4,502,791
Admin. & Waste Remediation Services	$111,309,425	$15,265,743	$126,575,168
Health & Educational Services	$1,938,763	$19,968,157	$21,906,920
Leisure & Hospitality	$859,312	$12,983,733	$13,843,045
Other Services	$3,126,768	$11,095,771	$14,222,539
Public Administration	$29	$5,323,097	$5,323,126
Total	**$377,999,421**	**$219,037,534**	**$597,036,955**

Source: UNM Bureau of Business and Economic Research, Los Alamos National Laboratory

Table 11. Impacts of Goods and Services and Construction Expenditures in the Seven-County Region by Industry, FY2017

Industry	Direct	Indirect	Total
Agriculture, Mining, Utilities	$5,270,849	$2,979,930	$8,250,779
Construction	$26,840,182	$1,130,064	$27,970,246
Manufacturing	$29,479,994	$1,157,749	$30,637,743
Wholesale & Retail Trade	$0	$8,938,186	$8,938,186
Transportation	$10,534	$1,797,626	$1,808,160
Information	$8,358,888	$5,293,501	$13,652,389
Financial Activities	$9,407,114	$27,616,358	$37,023,472
Prof, Scientific and Technical Services	$43,220,221	$8,837,476	$52,057,697
Management of Companies	$0	$839,131	$839,131
Admin. & Waste Remediation Services	$78,017,616	$5,206,410	$83,224,026
Health & Educational Services	$427,144	$8,706,090	$9,133,234
Leisure & Hospitality	$660,626	$6,309,878	$6,970,504
Other Services	$875,183	$4,566,351	$5,441,534
Public Administration	$0	$2,933,814	$2,933,814
Total	**$202,568,351**	**$86,312,564**	**$288,880,915**

Source: UNM Bureau of Business & Economic Research, Los Alamos National Laboratory

5. Fiscal Impacts of LANL on the State and Northern New Mexico

LANL benefits New Mexico by creating jobs, generating income and purchasing goods and services from local businesses. LANL also contributes to state and local government revenues that fund education, public safety, health and human services, judiciary and other public services. At the same time, LANL, its employees and those of its vendors, utilize services provided by state and local government. In this section, we examine the financial contributions and costs to public institutions in the state.

Table 12 summarizes LANL's contributions to the New Mexico General Fund and local governments in the seven-county region for FY2017. These estimates are based on detailed payroll and procurement data provided by LANL; estimated indirect and induced impacts of household and business expenditures, as described above; and tax payment rates derived from data provided by New Mexico's Taxation and Revenue Department and the Local Government Division of the state's Department of Finance and Administration.

These data indicate that LANL contributed a total of $129.4 million to the New Mexico's General Fund in 2017. This included $62.1 million in PIT payments made by LANL employees and those of its vendors, and $67.3 million in GRT made by LANL, its vendors and employees on in-state purchases.

Combined, LANL supported the payment of $70.8 million to county and municipal governments and other tax-supported entities such as community colleges and school building funds. Local government organizations receive GRT revenues and residential and non-residential property taxes paid by businesses and households supported by LANL. GRT payments to governments in the seven-county region, total $47.4 million and residential and non-residential property taxes sum to $23.4 million.

Table 12. Fiscal Revenues to State and in Northern New Mexico Governments, FY2017

	Personal Income Taxes	Gross Receipts Taxes	LANL Residential Property Taxes	LANL Non-Residential Property Taxes	Total Revenues
Total	$62,092,631	$124,175,889	$23,812,510	$4,135,256	$214,216,286
State	$62,092,631	$67,320,454			$129,413,085
7-Counties		$47,366,069	$20,307,999	$3,084,985	$70,759,053
Los Alamos		$36,800,473	$11,240,634	$1,979,039	$50,020,145
Mora		$8,755	$6,667	$1,000	$16,442
Rio Arriba		$3,233,218	$1,677,246	$179,791	$5,090,255
Sandoval		$1,407,208	$98,837	$12,996	$1,519,041
San Miguel		$53,452	$491,849	$271	$545,572
Santa Fe		$5,311,697	$6,445,068	$712,077	$12,468,842
Taos		$551,248	$347,698	$199,811	$1,098,757

Source: UNM Bureau of Business and Economic Research

Table 13 shows estimates of costs to state and local governments in the seven county region that are associated with shared use of services by LANL, its vendors and employees. These estimates are based on the most recently available audited financial statements of state and local governments and assume that costs are evenly distributed among households (i.e., LANL's cost of government service is proportionate to supported employment as a share of the number of households served by government).

On an aggregate basis, the fiscal revenues supported by LANL are $27.3 million or 15% greater than the implied cost of government services. The state government receives a substantial net benefit, totaling an estimated $11.7 million. The strength of the State's balance sheet owes in part to personal income tax payments made by relatively well-paid LANL employees.

The fiscal impact for the northern region, on the other hand, is mixed. In general, jurisdictions with businesses that serve LANL and its employees do well as these generate substantial GRT revenues while incurring relatively few costs. By contrast, jurisdictions that are primarily bedroom communities for LANL employees depend on

smaller property tax revenues while funding costly services to working households. This is characteristic of government finances in New Mexico rather than a specific impact of LANL.

Table 13. Fiscal Impacts of LANL on Northern New Mexico and the State, FY2017

	Total Revenues	Expenditures	Balance
Total	$214,216,286	$186,947,331	$27,268,995
State Government	$129,413,085	$117,678,594	$11,734,491
7-Counties	$70,759,053	$64,720,968	$6,038,085

Source: UNM Bureau of Business and Economic Research

6. Overall Assessment of Economic and Fiscal Impacts of LANL

LANL has a substantial impact on the economy of New Mexico. Directly and indirectly, in FY2017 revenues that LANL brought into the state supported the employment of 24,169 persons, the payment of $1.82 billion in wages, salaries and labor benefits, and generated $3.12 billion in sales to New Mexico businesses.

The principal channel through which LANL impacts the state economy is the household expenditures of its well-paid employees. In FY2017 fully 80% of LANL's impact on the state economy ($2.52 billion) was the result of household expenditures of LANL's employees and its vendors. LANL's procurement of goods and services from New Mexico-based businesses generated $526.9 million in sales, and construction contracts accounted for another $70.1 million.

LANL's economic impact is highly concentrated in neighboring communities, where most employees reside. More than three-quarters of LANL's economic impact occurred in the seven-county northern New Mexico region. Impacts of procurement were not as localized as the impacts of the spending of employees. Slightly more than half of LANL's in-state purchases were of businesses located in the seven-county region, but most of the remainder were with businesses located in Bernalillo County.

In FY2017, LANL also contributed substantially to public finances, for both state and local governments. In FY2017, LANL, its vendors and employees paid $124.2 million in GRT, $62.1 million in PIT, and $27.9 million in property taxes, substantially offsetting $186.9 million in costs to state and local governments. Revenues to the State's General Fund far outweighed the costs that the State incurred in supporting LANL and its employees, resulting an in estimated $11.7 million surplus in FY2017. Benefits to state government were due equally to PIT payments of well-paid employees and GRT payments of vendors to LANL and its employees.

The fiscal impacts for local governments are less clear cut, depending on the balance of business and residential activities. Areas with a large number of businesses that are vendors to LANL, such as Los Alamos and Bernalillo counties, do well because they receive GRT on sales. On the other hand, residential communities are more likely to run deficits because they incur the costs of services to households but collect relatively little from property taxes. In New Mexico deficits can be compounded because counties are not eligible to receive taxes on the income of residents.
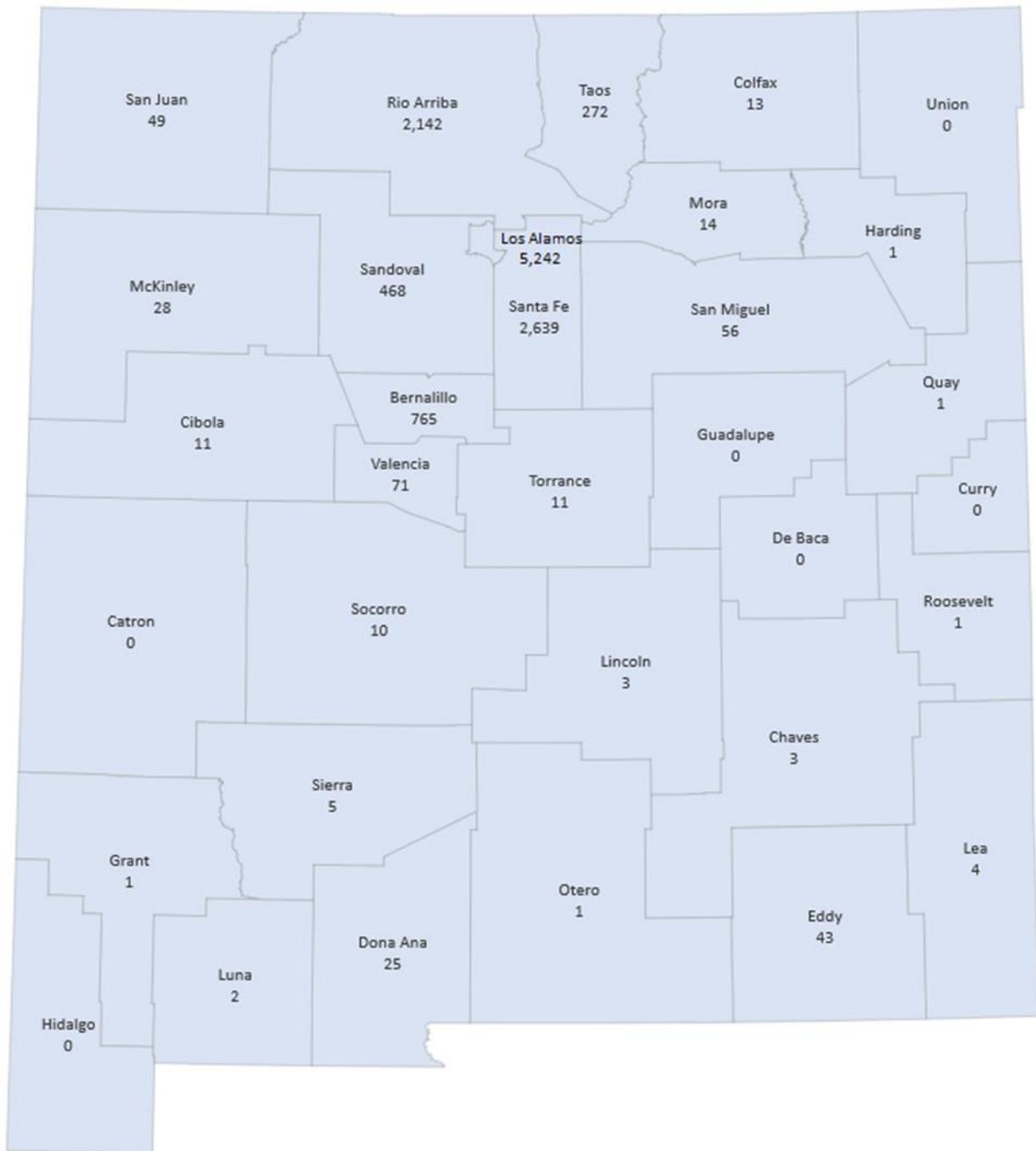
Appendix 1. LANL Employees by County and Category[1]

County	LANL	Craft	Contractor	Total
Bernalillo	265	465	35	765
Catron	-	-	-	-
Chaves	1	2	-	3
Cibola	-	11	-	11
Colfax	1	12	-	13
Curry	-	-	-	-
De Baca	-	-	-	-
Doña Ana	13	8	4	25
Eddy	43	-	-	43
Grant	-	1	-	1
Guadalupe	-	-	-	-
Harding	-	1	-	1
Hidalgo	-	-	-	-
Lea	1	3	-	4
Lincoln	-	3	-	3
Los Alamos	4,913	72	257	5,242
Luna	1	1	-	2
McKinley	1	26	1	28
Mora	3	11	-	14
Otero	0	1	-	1
Quay	1	-	-	1
Rio Arriba	1,589	367	186	2,142
Roosevelt	1	-	-	1
San Juan	3	46	-	49
San Miguel	31	22	3	56
Sandoval	346	77	45	468
Santa Fe	1,992	479	168	2,639
Sierra	1	4	-	5
Socorro	7	3	-	10
Taos	173	76	23	272
Torrance	**2**	**9**	-	11
Union	-	-	-	-
Valencia	22	47	2	71
New Mexico	9,410	1,747	724	11,882
Out of State	498	1,810	498	2,806
Grand Total	9,908	3,557	1,222	14,688

Source: Los Alamos National Laboratory

[1]LANL employees include regular, limited term, long-term visiting staff, DPD, postdoctoral and student (high school, undergraduate, graduate) employees

Appendix 3. LANL Gross Payrolls by County and Employee Category[1]

County	LANL	Craft	Contractor	Total
Bernalillo	$35,177,547	$27,450,090	$1,794,874	$64,422,510
Catron	-	-	-	-
Chaves	$9,493	$25,871	-	$35,364
Cibola	-	$435,201	-	$435,201
Colfax	$97,307	$823,731	-	$921,037
Curry	-	-	-	-
De Baca	-	-	-	-
Doña Ana	$961,200	$323,395	$192,752	$1,477,347
Eddy	$7,017,947	-	-	$7,017,947
Grant	$21,360	$45,997	-	$67,357
Guadalupe	-	-	-	-
Harding	-	$146,170	-	$146,170
Hidalgo	-	-	-	-
Lea	$26,107	$87,703	-	$113,810
Lincoln	-	$88,126	-	$88,126
Los Alamos	$783,176,267	$5,389,321	$12,672,586	$801,238,174
Luna	$66,453	$22,853	-	$89,307
McKinley	$42,720	$1,171,066	$39,013	$1,252,799
Mora	$154,267	$573,542	-	$727,808
Otero	$40,347	$93,771	-	$134,118
Quay	$284,800	-	-	$284,800
Rio Arriba	$184,793,667	$21,504,451	$5,101,321	$211,399,439
Roosevelt	$9,493	-	-	$9,493
San Juan	$231,400	$1,508,220	-	$1,739,620
San Miguel	$3,622,893	$1,284,884	$170,576	$5,078,353
Sandoval	$49,335,667	$5,214,632	$2,252,576	$56,802,874
Santa Fe	$308,221,240	$30,913,867	$7,914,180	$347,049,288
Sierra	$201,733	$189,055	-	$390,788
Socorro	$337,013	$73,377	-	$410,390
Taos	$19,060,240	$4,711,278	$881,165	$24,652,682
Torrance	$315,653	$382,844	-	$698,498
Union	-	-	-	-
Valencia	$2,796,973	$2,975,695	$62,492	$5,835,160
New Mexico	$1,396,001,787	$105,435,138	$31,081,535	$1,532,518,459
Out of State	$48,648,587	$2,341,080	$5,750,150	$56,739,816
Grand Total	$1,444,650,373	$107,776,218	$36,831,685	$1,589,258,276

Source: Los Alamos National Laboratory

[1]LANL employees include regular, limited term, long-term visiting staff, DPD, postdoctoral and student (high school, undergraduate, graduate) employees

Appendix 4. Total LANL Gross Payrolls by County

New Mexico county map showing Total LANL Gross Payrolls by County:

- San Juan $1,739,620
- Rio Arriba $211,399,439
- Taos $24,652,682
- Colfax $921,037
- Union $-
- Mora $727,808
- Harding $146,170
- Los Alamos $801,238,174
- Sandoval $56,802,874
- McKinley $1,252,799
- San Miguel $5,078,353
- Santa Fe $347,049,288
- Bernalillo $64,422,510
- Quay $284,800
- Cibola $435,201
- Guadalupe $-
- Valencia $5,835,160
- Torrance $698,498
- Curry $-
- De Baca $-
- Catron $-
- Socorro $410,390
- Roosevelt $9,493
- Lincoln $88,126
- Chaves $35,364
- Sierra $390,788
- Lea $113,810
- Grant $67,357
- Otero $134,118
- Eddy $7,017,947
- Dona Ana $1,477,347
- Luna $89,307
- Hidalgo $-