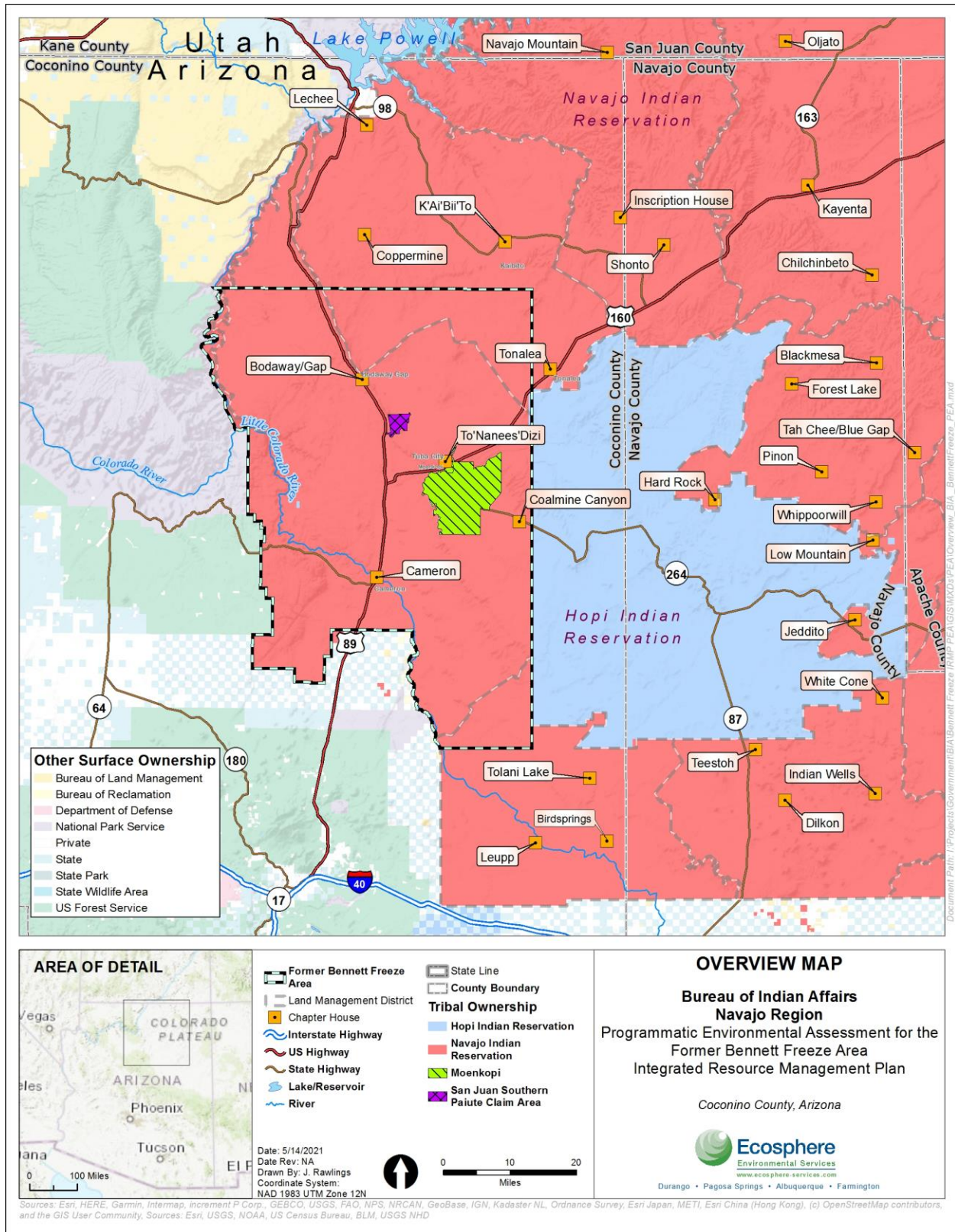
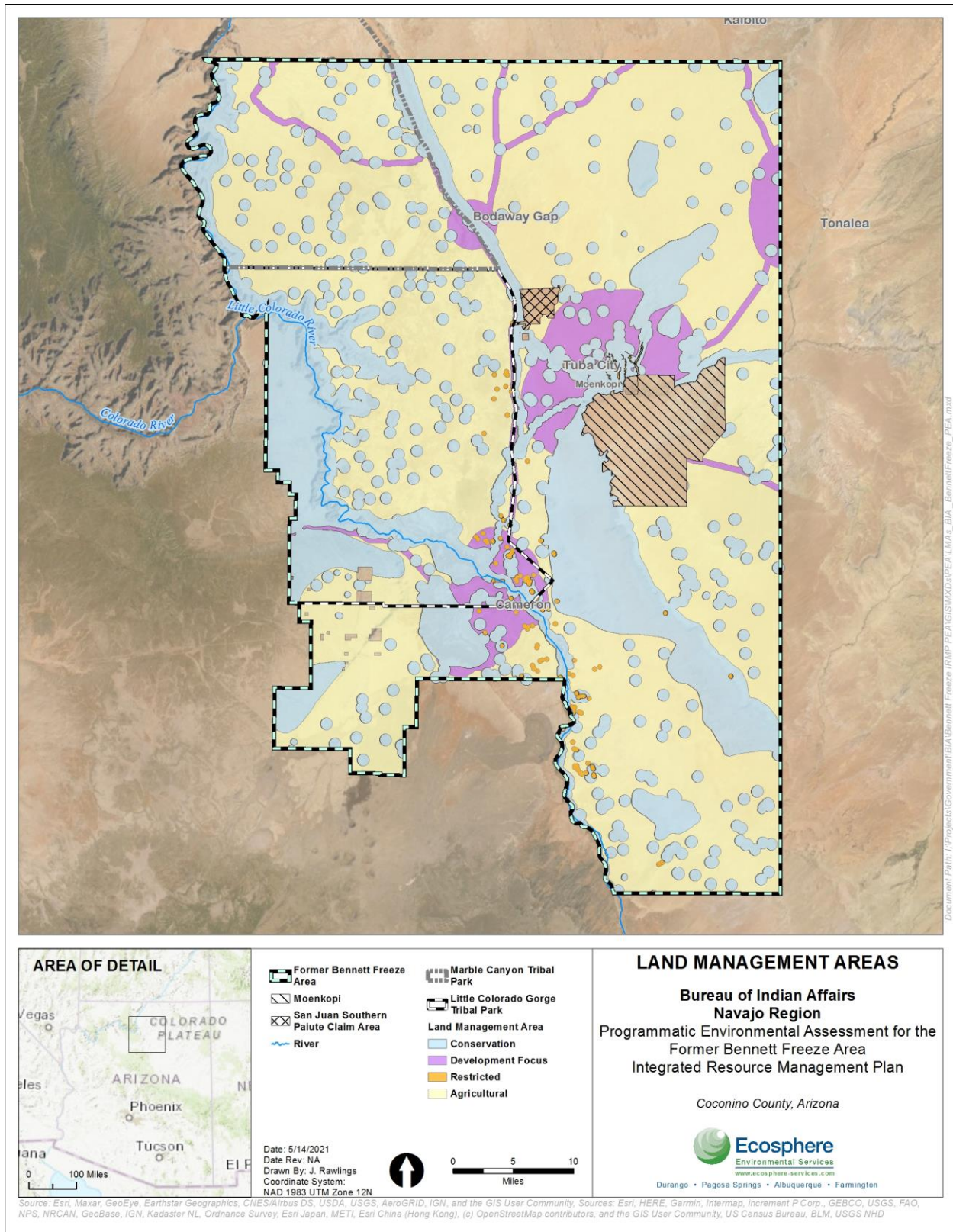


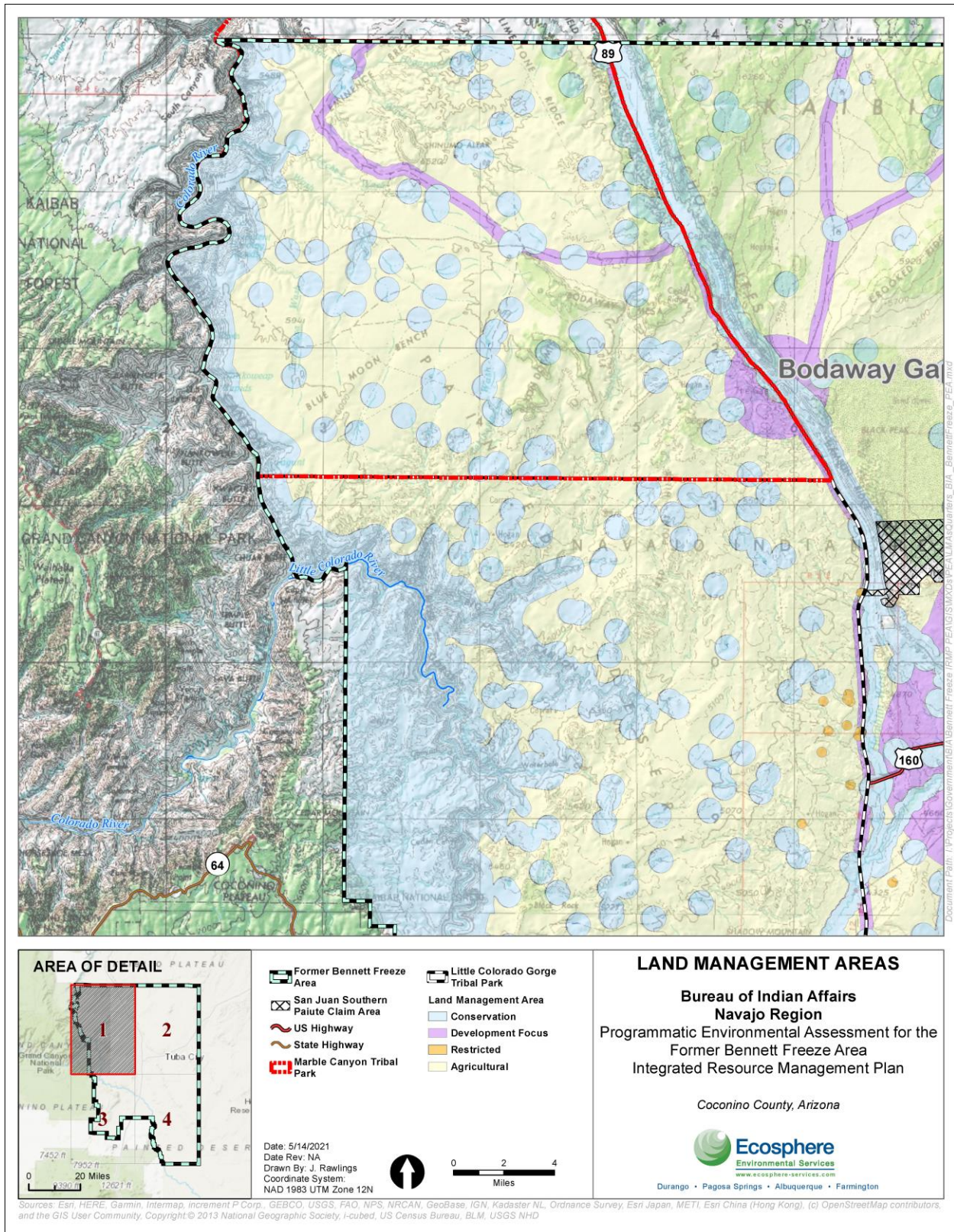
Appendix A – Maps



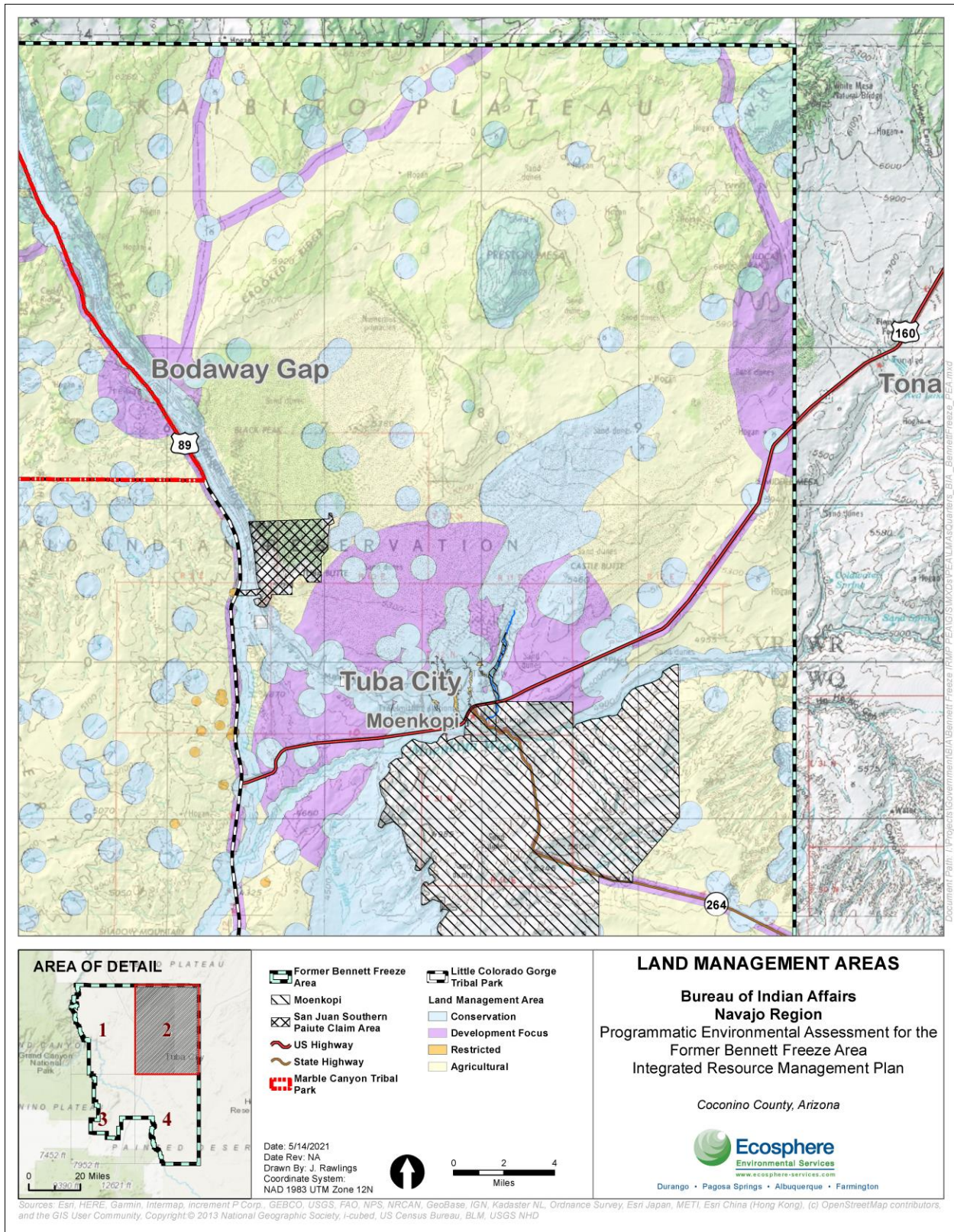
Map A-1. Overview of the Former Bennett Freeze Area



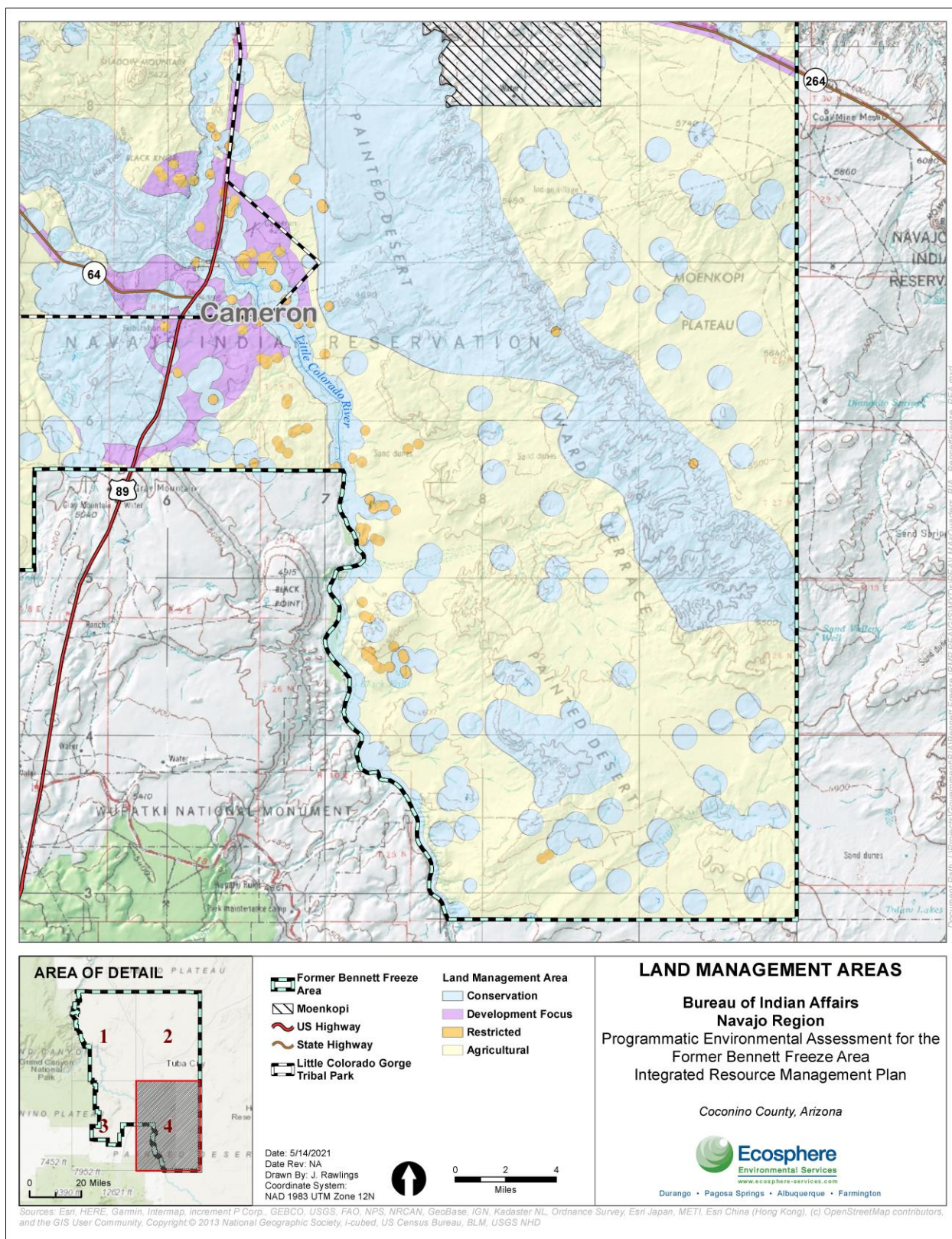
Map A-2. Proposed Land Management Areas in the Former Bennett Freeze



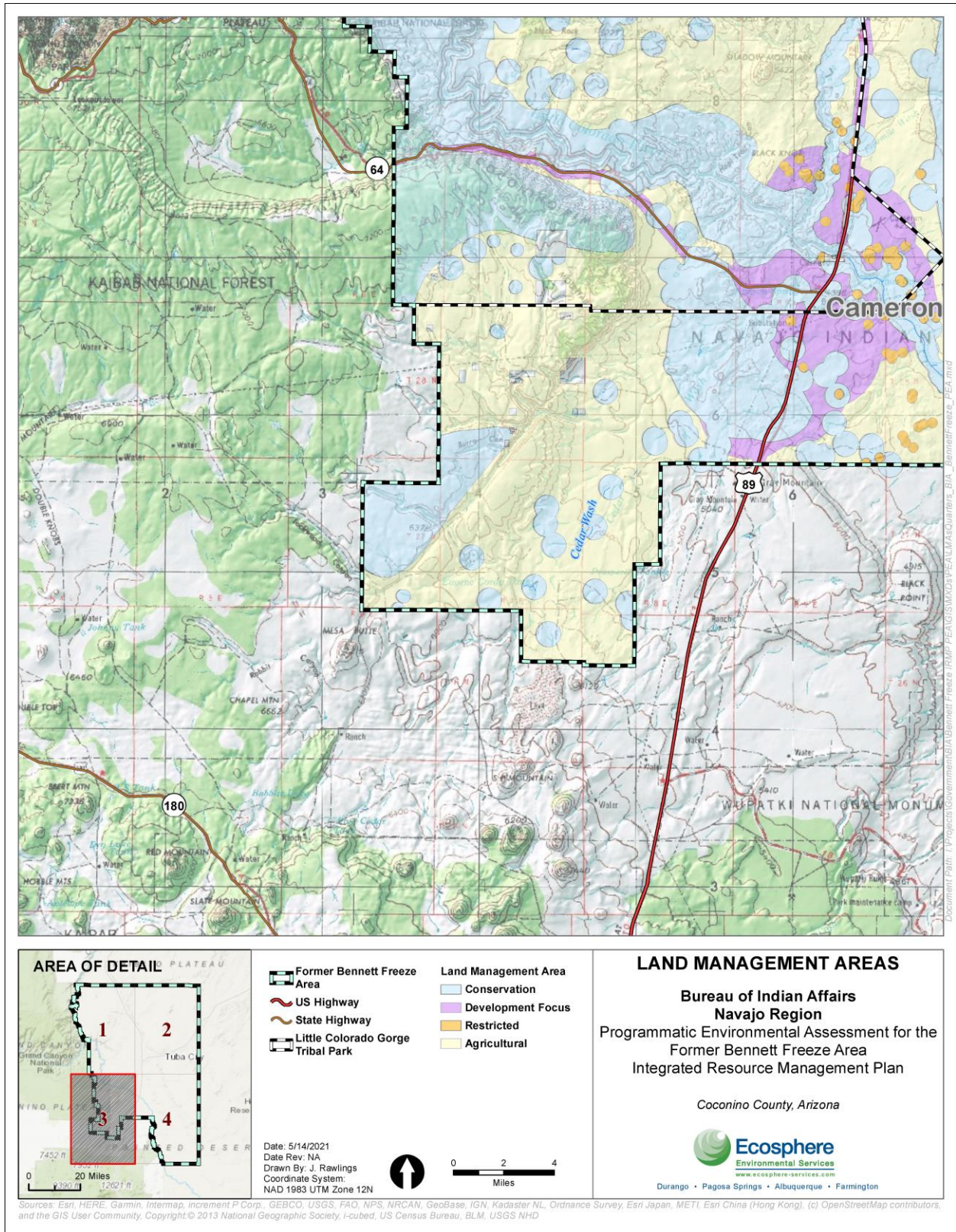
Map A-3. Proposed Land Management Areas in the Former Bennett Freeze Area NW Quarter



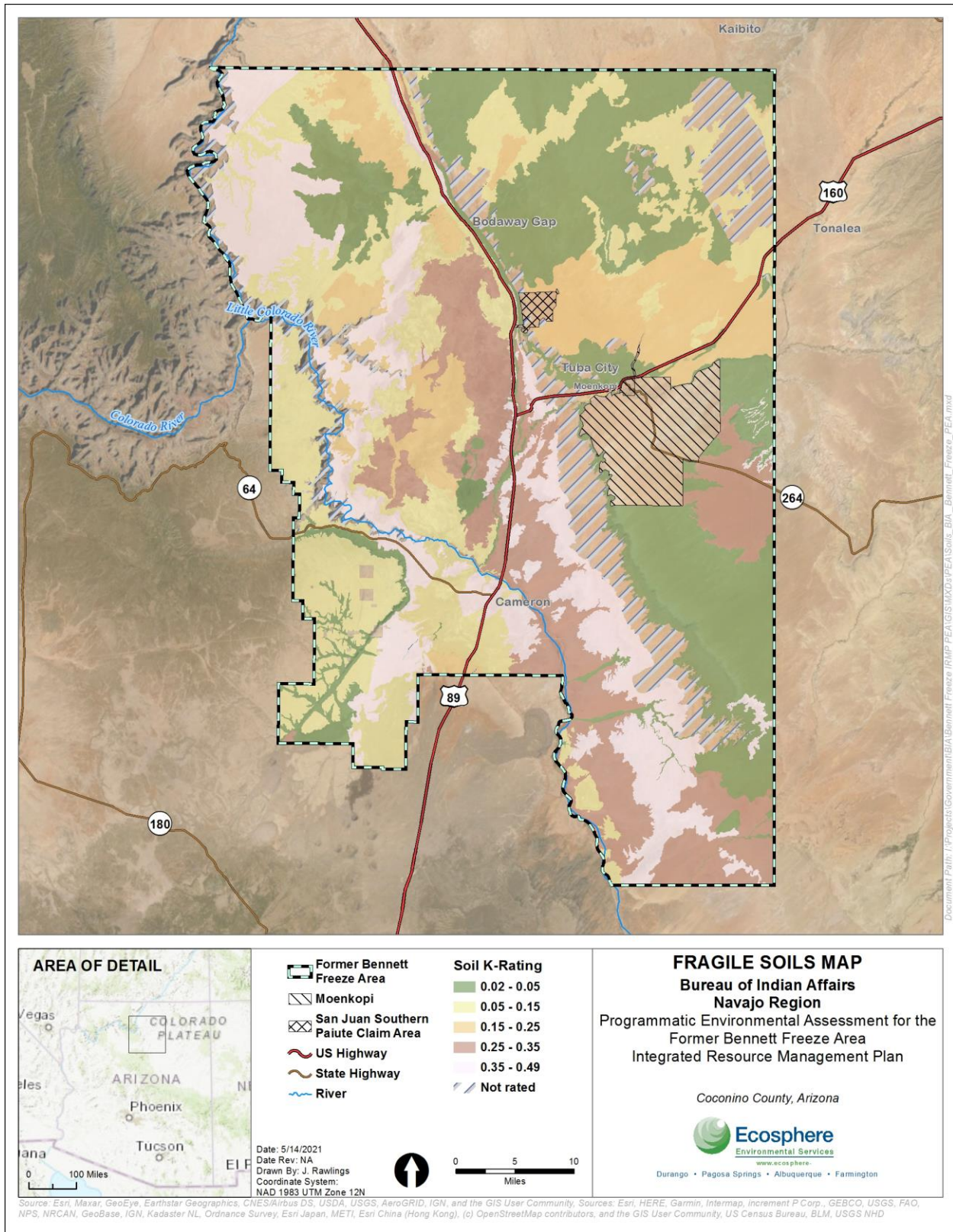
Map A-4. Proposed Land Management Areas in the Former Bennett Freeze Area NE Quarter



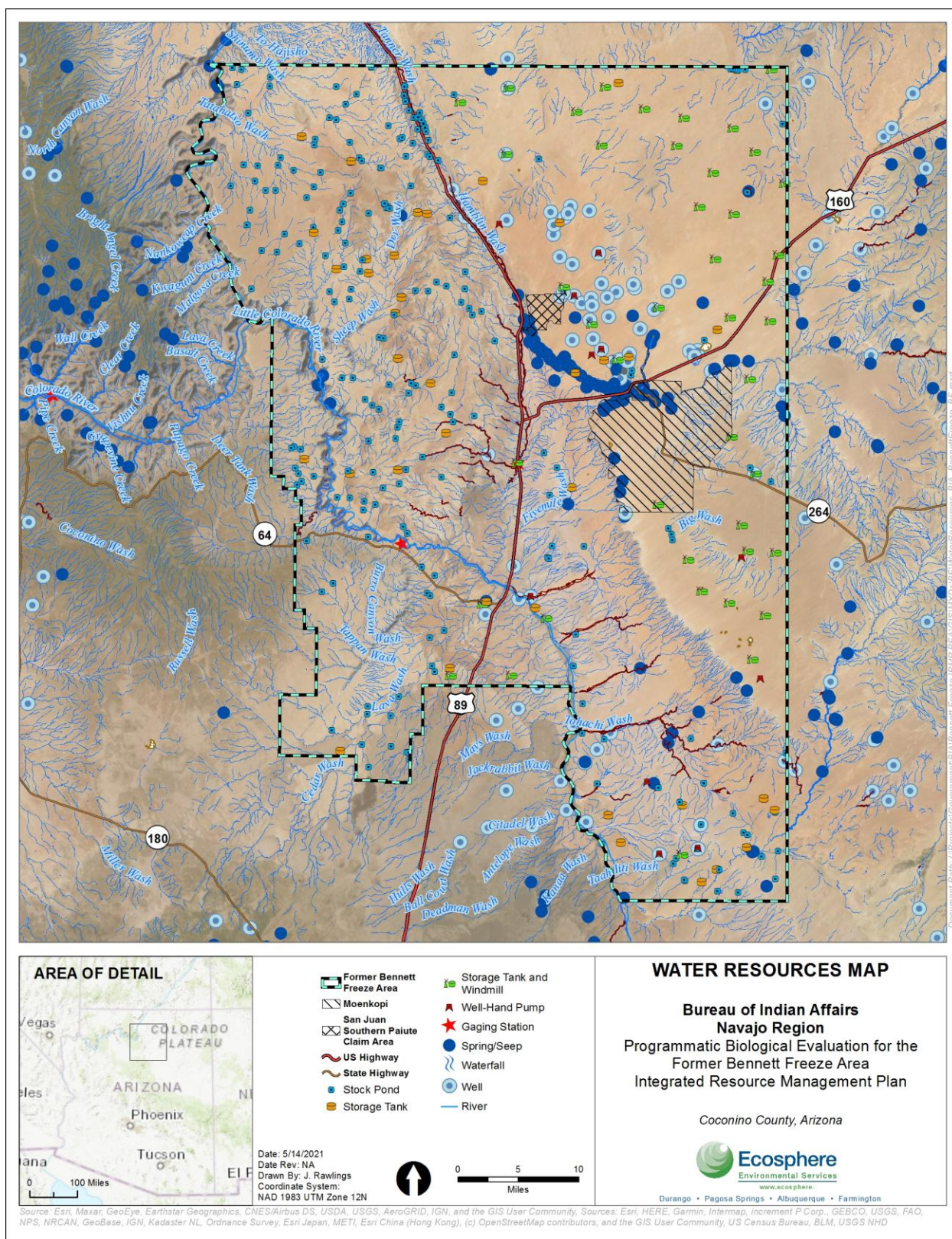
Map A-5. Proposed Land Management Areas in the Former Bennett Freeze Area SE Quarter



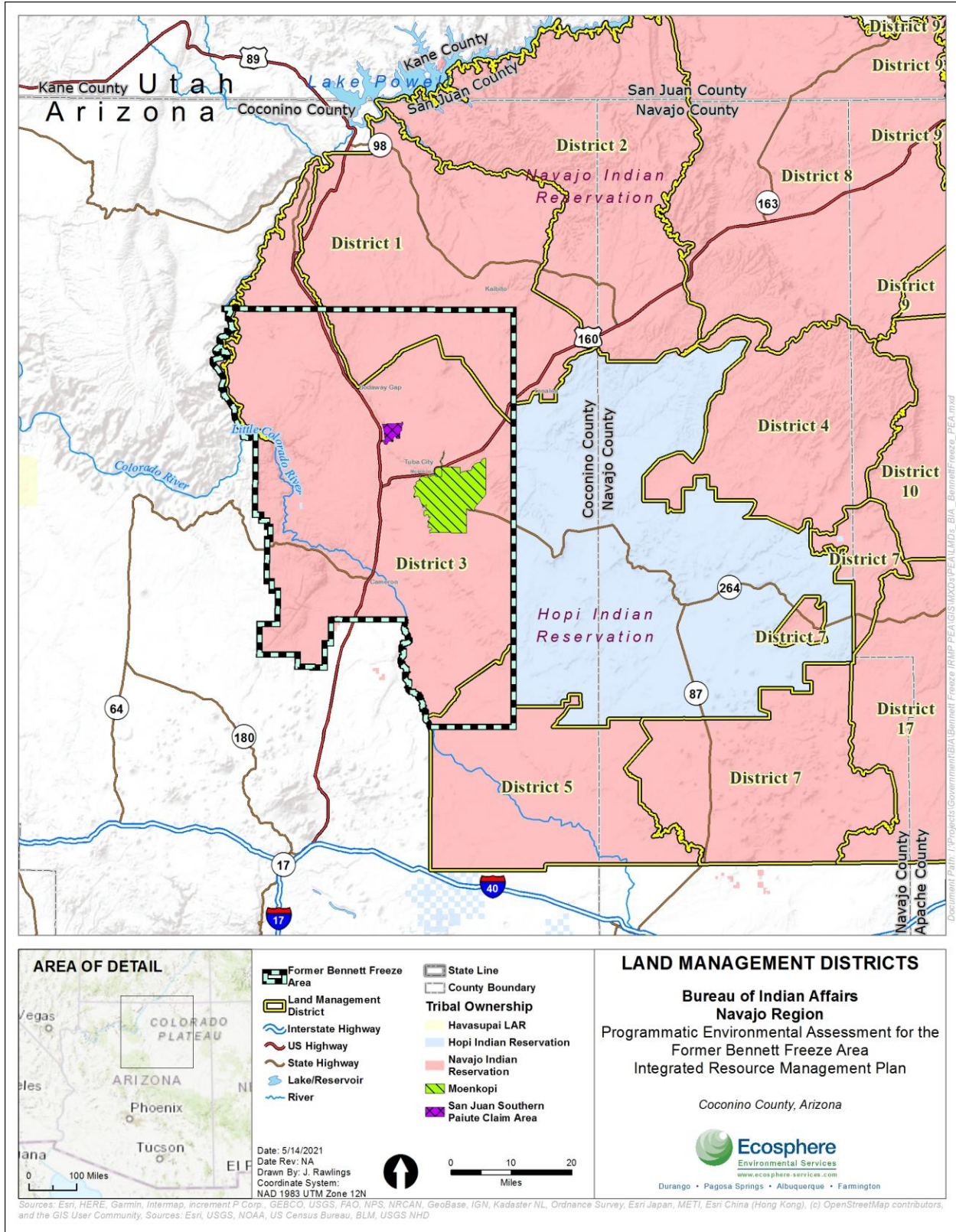
Map A-6. Proposed Land Management Areas in the Former Bennett Freeze Area SW Quarter



Map A-7. Fragile Soils in the Former Bennett Freeze Area



Map A-8. Water Resources in the Former Bennett Freeze Area



Map A-9. Grazing Land Management Districts in the Former Bennett Freeze Area

Appendix B – Economic Impact and Socioeconomic Analysis of the Former Bennett Freeze Area

Economic Impact and Socioeconomic Analysis of the Former Bennett Freeze Area

Prepared for Ecosphere Environmental Services, Inc.



by

Triple Point Strategic Consulting LLC



December 18, 2020

This page intentionally left blank.

TABLE OF CONTENTS

1. Executive Summary	1
2. Introduction	3
3. Purpose of this Analysis	5
4. Methodology.....	6
4.1 IMPLAN.....	6
4.1.1 Description of IMPLAN Model Output and Estimates of Economic Impacts	7
4.2 Documents Reviewed for Data Inputs.....	7
4.3 Dollar Years	7
4.4 Disclaimer	8
5. Regional and Chapter-Specific Projects.....	9
5.1 Organization of Capital Expenditure Budgets.....	9
5.1.1 The 2008 Recovery Plan.....	9
5.1.2 Chapter-Specific Project Categories.....	9
5.1.3 Proposed Studies	9
5.1.4 Share of Project Costs within FBFA Boundary.....	10
5.1.5 Furniture, Fixtures, and Equipment Expenditures	10
5.1.6 Total Adjusted Chapter-Specific Capital Budget	10
5.2 Economic Impact of Chapter-Specific Projects per Chapter.....	10
5.2.1 Bodaway Gap	10
5.2.2 Cameron	12
5.2.3 Coalmine Canyon	14
5.2.4 Coppermine	16
5.2.5 Kaibeto	18
5.2.6 Leupp.....	20
5.2.7 Tolani Lake.....	22
5.2.8 Tonalea	24
5.2.9 Tuba City	26

5.2.10 Regional.....	27
5.3 Chapter-Specific Projects by Category and Phasing	29
5.3.1 Community Facilities and Recreation	29
5.3.2 Education.....	30
5.3.3 New Scattered Housing	30
5.3.4 New Multifamily and Clustered Housing.....	31
5.3.5 Housing Repairs	32
5.3.6 Health	32
5.3.7 Infrastructure	33
5.3.8 Public Safety.....	34
5.3.9 Transportation.....	35
5.3.10 Total of Chapter-Specific and Regional Projects Combined.....	36
6. Infrastructure Capital Improvement Projects.....	38
6.1 Organization of Infrastructure Capital Improvement Plan Capital Expenditure Budgets	38
6.2 ICIP Land Acquisition.....	38
6.3 Other ICIP Expense Items	38
6.4 ICIP Project Impacts by Chapter.....	39
6.4.1 Bodaway Gap	39
6.4.2 Cameron	40
6.4.3 Coalmine Canyon	41
6.4.4 Coppermine	41
6.4.5 Kaibeto	42
6.4.6 Leupp.....	42
6.4.7 Tolani Lake.....	43
6.4.8 Tonalea	44
6.4.9 Tuba City	44
6.5 Infrastructure Capital Improvement Plan Project Impacts by Category.....	45

6.5.1 Cemetery Projects.....	45
6.5.2 Chapter House	46
6.5.3 Economic Development	46
6.5.4 Head Start	47
6.5.5 Housing.....	47
6.5.6 Multi-purpose Buildings.....	48
6.5.7 Parking Lots.....	48
6.5.8 Public Safety.....	49
6.5.9 Recreation.....	49
6.5.10 Roads/Streets	50
6.5.11 Senior Citizens.....	50
6.5.12 Single Phase.....	51
6.5.13 Solid Waste.....	52
6.5.14 Water System.....	52
6.6 Phasing	53
6.6.1 First Year – 2021	53
6.6.2 Second Year – 2022.....	54
6.6.3 Third Year – 2023	54
6.6.4 Fourth Year – 2024.....	55
6.6.5 Fifth Year – 2025.....	55
6.6.6 Sixth Year – 2026.....	56
6.7 Total of Infrastructure Capital Improvement Projects.....	56
7. Immediate Recovery Projects.....	59
7.1 Organization of Immediate Recovery Capital Expenditure Budgets	59
7.1.1 Echo Cliffs Health Center.....	59
7.1.2 Little Colorado River Valley Farms Project.....	59
7.1.3 Construction of the Little Colorado River Valley Farms Project	59

7.1.4 Operation of the Little Colorado River Valley Farms Project.....	60
7.1.5 Livestock and Water Projects	61
7.1.6 Tuba City Airport	61
7.1.7 Other Immediate Recovery Projects.....	62
7.2 Total Economic Impact of Immediate Recovery Projects	62
8. Socioeconomic Analysis of the FBFA	65
8.1 Total Combined Economic Impact of All Recovery Projects	65
8.2 Coconino County Economy	66
8.2.1 Size of Coconino County Economy	66
8.2.2 Coconino County Construction Sector	67
8.3 Demographic Trends and Impacts.....	67
8.3.1 Population trends	67
8.3.2 Planned housing development within the FBFA.....	67
8.3.3 Jobs	68
8.3.4 School Construction	69
8.4 Lifestyle Trade-Offs	69
8.4.1 Solar Energy	69
8.4.2 Environmental Restoration	69
8.4.3 Telecommunications.....	69
8.4.4 Business and Commercial Sites.....	70
8.5 Cumulative Impacts.....	70
9. Summary	71
10. Glossary.....	72

LIST OF TABLES

Table 1-1. Total Economic Impact of All Chapter-Specific Projects	2
Table 5-1. Regional and Chapter-Specific Project Categories	9
Table 5-2. Bodaway Gap Chapter-Specific Project Budgets.....	12
Table 5-3. Inputs for the Bodaway Gap Chapter-Specific Projects.....	12
Table 5-4. Total Economic Impact of Bodaway Gap Chapter-Specific Projects	12
Table 5-5. Cameron Chapter-Specific Project Budgets.....	13
Table 5-6. Inputs for the Cameron Chapter-Specific Projects.....	14
Table 5-7. Total Economic Impact of Cameron Chapter-Specific Projects	14
Table 5-8. Coalmine Canyon Chapter-Specific Project Budgets	15
Table 5-9. Inputs for the Coalmine Canyon Chapter-Specific Projects	16
Table 5-10. Total Economic Impact of Coalmine Canyon Chapter-specific Projects.....	16
Table 5-11. Coppermine Chapter-Specific Project Budgets.....	17
Table 5-12. Inputs for the Coppermine Chapter-Specific Projects.....	17
Table 5-13. Total Economic Impact of Coppermine Chapter-Specific Projects	18
Table 5-14. Kaibeto Chapter-Specific Project Budgets.....	19
Table 5-15. Inputs for the Kaibeto Chapter-Specific Projects.....	19
Table 5-16. Total Economic Impact of Kaibeto Chapter-Specific Projects	20
Table 5-17. Leupp Chapter-Specific Project Budgets	21
Table 5-18. Inputs for the Leupp Chapter-specific Projects.....	21
Table 5-19. Total Economic Impact of Leupp Chapter-Specific Projects.....	21
Table 5-20. Tolani Lake Chapter-Specific Project Budgets.....	23
Table 5-21. Inputs for the Tolani Lake Chapter-Specific Projects.....	23
Table 5-22. Total Economic Impact of Tolani Lake Chapter-Specific Projects	23
Table 5-23. Tonalea Chapter-Specific Project Budgets	25
Table 5-24. Inputs for the Tonalea Chapter-Specific Projects	25
Table 5-25. Total Economic Impact of Tonalea Chapter-Specific Projects	25

Table 5-26. Tuba City Chapter-Specific Project Budgets	26
Table 5-27. Inputs for the Tuba City Chapter-Specific Projects	27
Table 5-28. Total Economic Impact of Tuba City Chapter-Specific Projects.....	27
Table 5-29. Regional Project Budgets.....	28
Table 5-30. Inputs for the Regional Projects	28
Table 5-31. Total Economic Impact of Regional Projects	29
Table 5-32. Inputs for the Chapter-Specific Community Facilities and Recreation	29
Table 5-33. Total Economic Impact of Chapter-Specific Community Facilities and Rec	29
Table 5-34. Inputs for the Chapter-Specific Education Projects	30
Table 5-35. Total Economic Impact of Chapter-Specific Education Projects.....	30
Table 5-36. Inputs for the Chapter-Specific New Scattered Housing Projects	30
Table 5-37. Total Economic Impact of Chapter-Specific New Scattered Housing Projects	31
Table 5-38. Inputs for the Chapter-Specific New Multifamily Housing Projects	31
Table 5-39. Total Economic Impact of Chapter-Specific New Multifamily Housing Projects.....	31
Table 5-40. Inputs for the Chapter-Specific Housing Repair Projects	32
Table 5-41. Total Economic Impact of Chapter-Specific Housing Repair Projects.....	32
Table 5-42. Inputs for the Chapter-Specific Health Projects.....	33
Table 5-43. Total Economic Impact of Chapter-Specific Health Projects	33
Table 5-44. Inputs for the Chapter-Specific Infrastructure Projects.....	33
Table 5-45. Total Economic Impact of Chapter-Specific Infrastructure Projects	34
Table 5-46. Inputs for the Chapter-Specific Public Safety Projects	34
Table 5-47. Total Economic Impact of Chapter-Specific Public Safety Projects	35
Table 5-48. Inputs for the Chapter-Specific Transportation Projects	35
Table 5-49. Total Economic Impact of Chapter-Specific Transportation Projects	35
Table 5-50. Total Economic Impact of All Chapter-Specific Projects.....	36
Table 5-51. Tax Revenue Impacts of All Chapter-Specific Projects by Tax Category	36
Table 5-52. Total Economic Impact by Industry of All Chapter-Specific Projects for the Top 15 Industries.....	36
Table 6-1. Total Infrastructure Capital Improvement Plan Budget.....	38

Table 6-2. Total Infrastructure Capital Improvement Plan projects not associated with construction.....	39
Table 6-3. Inputs for the Bodaway Gap ICIPs	39
Table 6-4. Economic Impact of Bodaway Gap Infrastructure Capital Improvement Plan Projects.....	40
Table 6-5. Inputs for the Cameron Infrastructure Capital Improvement Plan Projects	40
Table 6-6. Economic Impact of Cameron Infrastructure Capital Improvement Plan Projects	40
Table 6-7. Inputs for the Coalmine Canyon Infrastructure Capital Improvement Plan Projects.....	41
Table 6-8. Economic Impact of Coalmine Canyon Infrastructure Capital Improvement Plan Projects.....	41
Table 6-9. Inputs for the Coppermine Infrastructure Capital Improvement Plan Projects	41
Table 6-10. Economic Impact of Coppermine Infrastructure Capital Improvement Plan Projects.....	42
Table 6-11. Inputs for the Kaibeto Infrastructure Capital Improvement Plan Projects	42
Table 6-12. Economic Impact of Kaibeto Infrastructure Capital Improvement Plan Projects	42
Table 6-13. Inputs for the Leupp Infrastructure Capital Improvement Plan Projects	42
Table 6-14. Economic Impact of Leupp Infrastructure Capital Improvement Plan Projects	43
Table 6-15. Inputs for the Tolani Lake Infrastructure Capital Improvement Plan Projects	43
Table 6-16. Economic Impact of Tolani Lake Infrastructure Capital Improvement Plan Projects	43
Table 6-17. Inputs for the Tonalea Infrastructure Capital Improvement Plan Projects.....	44
Table 6-18. Economic Impact of Tonalea Infrastructure Capital Improvement Plan Projects.....	44
Table 6-19. Inputs for the Tuba City Infrastructure Capital Improvement Plan Projects	44
Table 6-20. Economic Impact of Tuba City Infrastructure Capital Improvement Plan Projects	45
Table 6-21. Inputs for the Infrastructure Capital Improvement Plan Cemetery Projects	45
Table 6-22. Total Economic Impact of the Infrastructure Capital Improvement Plan Cemetery Projects.....	45
Table 6-23. Inputs for the Infrastructure Capital Improvement Plan Chapter House Projects.....	46
Table 6-24. Total Economic Impact of the Infrastructure Capital Improvement Plan Chapter House Projects	46
Table 6-25. Inputs for the Infrastructure Capital Improvement Plan Economic Development Projects	46
Table 6-26. Total Economic Impact of the Infrastructure Capital Improvement Plan Economic Development Projects	46
Table 6-27. Inputs for the Infrastructure Capital Improvement Plan Head Start Projects.....	47
Table 6-28. Total Economic Impact of the Infrastructure Capital Improvement Plan Head Start Projects	47

Table 6-29. Inputs for the Infrastructure Capital Improvement Plan Housing Projects47

Table 6-30. Total Economic Impact of the Infrastructure Capital Improvement Plan Housing Projects.....47

Table 6-31. Inputs for the Infrastructure Capital Improvement Plan Multi-Purpose Building Projects.....48

Table 6-32. Total Economic Impact of the Infrastructure Capital Improvement Plan Multi-Purpose Building Projects48

Table 6-33. Inputs for the Infrastructure Capital Improvement Plan Parking Lot Projects.....48

Table 6-34. Total Economic Impact of the Infrastructure Capital Improvement Plan Parking Lot Projects49

Table 6-35. Inputs for the Infrastructure Capital Improvement Plan Public Safety Projects49

Table 6-36. Total Economic Impact of the Infrastructure Capital Improvement Plan Public Safety Projects49

Table 6-37. Inputs for the Infrastructure Capital Improvement Plan Recreation Projects49

Table 6-38. Total Economic Impact of the Infrastructure Capital Improvement Plan Recreation Projects50

Table 6-39. Inputs for the Infrastructure Capital Improvement Plan Roads/streets Projects50

Table 6-40. Total Economic Impact of the Infrastructure Capital Improvement Plan Roads/streets Projects50

Table 6-41. Inputs for the Infrastructure Capital Improvement Plan Senior Citizens Projects50

Table 6-42. Total Economic Impact of the Infrastructure Capital Improvement Plan Senior Citizens Projects.....51

Table 6-43. Inputs for the Infrastructure Capital Improvement Plan Single Phase Projects51

Table 6-44. Total Economic Impact of the Infrastructure Capital Improvement Plan ICIP Single Phase Projects .52

Table 6-45. Inputs for the Infrastructure Capital Improvement Plan Solid Waste Projects52

Table 6-46. Total Economic Impact of the Infrastructure Capital Improvement Plan Solid Waste Projects.....52

Table 6-47. Inputs for the Infrastructure Capital Improvement Plan Water System Projects52

Table 6-48. Total Economic Impact of the Infrastructure Capital Improvement Plan System Projects53

Table 6-49. Inputs for the Infrastructure Capital Improvement Plan 2021 Projects.....53

Table 6-50. Total Economic Impact of the ICIP 2021 Projects54

Table 6-51. Inputs for the Infrastructure Capital Improvement Plan 2022 Projects.....54

Table 6-52. Total Economic Impact of the Infrastructure Capital Improvement Plan 2022 Projects54

Table 6-53. Inputs for the Infrastructure Capital Improvement Plan 2023 Projects.....54

Table 6-54. Total Economic Impact of the Infrastructure Capital Improvement Plan 2023 Projects55

Table 6-55. Inputs for the Infrastructure Capital Improvement Plan 2024 Projects.....55

Table 6-56. Total Economic Impact of the Infrastructure Capital Improvement Plan 2024 Projects	55
Table 6-57. Inputs for the Infrastructure Capital Improvement Plan 2025 Projects.....	55
Table 6-58. Total Economic Impact of the Infrastructure Capital Improvement Plan 2025 Projects	56
Table 6-59. Inputs for the Infrastructure Capital Improvement Plan 2026 Projects.....	56
Table 6-60. Total Economic Impact of the Infrastructure Capital Improvement Plan 2026 Projects	56
Table 6-61. Total Economic Impact of All Nine Chapter Infrastructure Capital Improvement Plan Projects.....	57
Table 6-62. Tax Revenue Impacts of All Nine Chapter Infrastructure Capital Improvement Plan Projects	57
Table 6-63. Total Economic Impact by Industry of All Infrastructure Capital Improvement Plan Projects for the Top 15 Industries	57
Table 7-1. Inputs for the Echo Cliffs Health Center.....	59
Table 7-2. Total Economic Impact of the Echo Cliffs Health Center	59
Table 7-3. Inputs for the Little Colorado River Valley Farms Construction.....	60
Table 7-4. Total Economic Impact of the Little Colorado River Valley Farms Construction	60
Table 7-5. Inputs for the Little Colorado River Valley Farms Annual Operations	60
Table 7-6. Total Economic Impact of the Little Colorado River Valley Farms Annual Operations.....	60
Table 7-7. Inputs for the Livestock and Water Projects	61
Table 7-8. Total Economic Impact of the Livestock and Water Projects.....	61
Table 7-9. Inputs for the Tuba City Airport Improvements	61
Table 7-10. Total Economic Impact of the Tuba City Airport Improvements	62
Table 7-11. Inputs for the Other Economic Development Projects.....	62
Table 7-12. Total Economic Impact of the Other Economic Development Projects	62
Table 7-13. Total Economic Impact of All Immediate Recovery Projects	63
Table 7-14. Tax Revenue Impacts of All Immediate Recovery Projects	63
Table 7-15 Total Economic Impact by Industry of All Immediate Recovery Projects for the Top 15 Industries....	63
Table 8-1. Total Economic Impact of Implementing the 2020 Recovery Plan for the FBFA.....	65
Table 8-2. Comparison of Total County Output with Grand Total Recovery Plan Output.....	66
Table 8-3. Top 10 Largest Economic Sectors in Coconino County in 2018.....	66
Table 8-4. Comparison of County's Construction Output with Recovery Plan's Direct Output	67

Table 8-5. Estimates of population and housing needs over time67

Table 8-6. Chapter-Specific Housing Plans compared to FBFA population.....68

Table 8-7. Estimates of population and jobs compared to the Recovery Plan Job Impacts68

LIST OF APPENDIX TABLES

Appendix Table A-1. Economic Impact of Tuba City Chapter-Specific Projects by Category A-2

Appendix Table A-2. Economic Impact of Bodaway Gap Chapter-Specific Projects by Category A-3

Appendix Table A-3. Economic Impact of Cameron Chapter-Specific Projects by Category A-5

Appendix Table A-4. Economic Impact of Coalmine Canyon Chapter-Specific Projects by Category A-7

Appendix Table A-5. Economic Impact of Coppermine Chapter-Specific Projects by Category A-9

Appendix Table A-6. Economic Impact of Kaibeto Chapter-Specific Projects by Category A-10

Appendix Table A-7. Economic Impact of Leupp Chapter-Specific Projects by Category A-12

Appendix Table A-8. Economic Impact of Tolani Lake Chapter-Specific Projects by Category A-14

Appendix Table A-9. Economic Impact of Tonalea Chapter-Specific Projects by Category A-15

Appendix Table A-10. Economic Impact of Regional Chapter-Specific Projects by Category A-17

Appendix Table B-1. The Economic Impacts of Chapter-Specific Community and Rec Facilities Projects by Year
.....B-2

Appendix Table B-2. The Economic Impacts of Chapter-Specific Education Projects by YearB-3

Appendix Table B-3. The Economic Impacts of Chapter-Specific New Scattered Housing Projects by YearB-5

Appendix Table B-4. The Economic Impacts of Chapter-Specific New Multifamily Housing Projects by Year .B-6

Appendix Table B-5. The Economic Impacts of Chapter-Specific Housing Repair Projects by YearB-8

Appendix Table B-6. The Economic Impacts of Chapter-Specific Health Projects by Year.....B-9

Appendix Table B-7. The Economic Impacts of Chapter-Specific Infrastructure Projects by Year.....B-11

Appendix Table B-8. The Economic Impacts of Chapter-Specific New Public Safety Projects by YearB-12

Appendix Table B-9. The Economic Impacts of Chapter-Specific Transportation Projects by YearB-14

1. Executive Summary

The purpose of this analysis is to estimate the economic impacts within the Former Bennett Freeze Area (FBFA) that would result from the implementation of the Navajo Thaw Regional Recovery Plan (Building Communities, Inc. and Native Builders, LLC 2020). The 2020 Recovery Plan is the starting point and framework for this economic impact and socioeconomic analysis and provides a summary overview of projects previously budgeted.

Three groups of projects are identified: (1) Chapter-Specific, (2) Infrastructure Capital Improvement Plan, and (3) Immediate Recovery. Each project budget was evaluated so that land acquisition expenses; furniture, fixtures, and equipment (FFE); and study-only project expenses could be excluded from capital budgets. Within each group, the projects' economic impacts were modeled for each of several breakouts, including by chapter, category, and phasing year.

The combined total direct capital budget amount is \$3.6 billion, for which the total economic impact is \$5.2 billion, in 2021 dollars. The majority of the budget is allocated to housing. The total capital budget for the Chapter-specific projects is \$3 billion, of which \$1.6 billion is for housing. Infrastructure accounts for over \$630 million of the Chapter-specific budget. Table 1-1 below summarizes direct, indirect, and induced impacts for each group of projects.

The Immediate Recovery Projects are considered to be closest to shovel-ready as the name suggests. Of the \$257 million capital budget, \$154 million is for the Echo Cliffs Health Center. Both the Chapter-specific and Infrastructure Capital Improvement Plan projects are expected to be developed over six to seven-year time horizons.

Even with phased development, this amount of capital investment is very large relative to the size of the Coconino County economy and its construction sector. The total output of the County in 2018 was \$12.1 billion. From 2010 to 2018, the total output of the County grew by \$3.7 billion. The FBFA is a subset of the County's economy.

As of 2018, the Coconino County construction sector employed just under 4,000 people and produced a total output of just over \$500 million. The total number of direct annual jobs to develop all recovery plan projects is over 30,000 or approximately 5,000 per year for six years – more than the County's entire construction sector. This comparison raises the question of where will the workforce come from and live throughout project development?

Many of the individual project budgets appear to be rough estimates and systematic approximations. Many were developed over 10 years ago and relied on population growth projections we now know were too high. Further planning should more precisely evaluate the necessary level of development and more carefully estimate capital budgets. The total recovery plan budget and resulting economic impacts will still be substantial, but implementation will benefit from more accurate forecasting and planning.

Table 1-1. Total Economic Impact of All Chapter-Specific Projects

Total Economic Impact of All Chapter-Specific Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	27,335	\$1,348,273,121	\$1,371,681,891	\$269,357,285	\$2,989,312,297
Indirect	3,869	\$176,745,245	\$269,686,884	\$130,508,192	\$576,940,320
Induced	5,525	\$246,998,940	\$319,199,083	\$211,917,865	\$778,115,888
Total	36,729	\$1,772,017,305	\$1,960,567,858	\$611,783,342	\$4,344,368,505
Total Economic Impact of All Nine Chapter Infrastructure Capital Improvement Plan Projects					
Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	2,530	\$122,888,236	\$168,263,290	\$46,869,597	\$338,021,123
Indirect	330	\$16,241,595	\$27,857,820	\$11,226,485	\$55,325,901
Induced	504	\$22,535,259	\$29,122,565	\$19,333,612	\$70,991,436
Total	3,364	\$161,665,091	\$225,243,676	\$77,429,694	\$464,338,460
Total Economic Impact of All Immediate Recovery Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	328	\$102,479,269	\$124,471,231	\$29,927,323	\$256,877,823
Indirect	34	\$11,632,166	\$20,666,453	\$7,750,660	\$40,049,279
Induced	59	\$18,479,596	\$23,881,346	\$15,855,283	\$58,216,225
Total	421	\$132,591,031	\$169,019,030	\$53,533,265	\$355,143,326
Grand Total Economic Impact of All Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	30,193	\$1,573,640,625	\$1,664,416,413	\$346,154,205	\$3,584,211,243
Indirect	4,233	\$204,619,007	\$318,211,157	\$149,485,336	\$672,315,500
Induced	6,088	\$288,013,795	\$372,202,995	\$247,106,760	\$907,323,549
Total	40,514	\$2,066,273,427	\$2,354,830,564	\$742,746,301	\$5,163,850,292

2. Introduction

In 1966, the Commissioner of Indian Affairs, Robert Bennett, put in place an order halting economic development in order to pressure the Navajo and Hopi to resolve a land dispute. The order effectively “froze” all forms of development, from fixing roofs to constructing waterlines and repairing roads. This area became known as the Bennett Freeze Area, encompassing 1.6 million acres within the Navajo Nation. President Obama lifted this development ban in 2006. Approximately 7,000 people live in the FBFA. The FBFA lies entirely within Coconino County, Arizona, which covers almost 12 million acres and has a population of about 135,000.

Following the lifting of the Freeze, a \$1 million study, known as the Former Bennett Freeze Area Recovery Plan, was prepared to identify the Freeze impacts (WHPacific 2008). This recovery plan was completed in December 2008. For each of the nine Chapters having land within the FBFA, this recovery plan detailed the economic development necessary to mitigate the Freeze impacts. Recovery plan projects ranged from housing construction to infrastructure development to community recreational facilities. Brief descriptions and capital funding requirements are provided for each of 357 projects.

According to the Bodaway Gap Chapter Community-Based Land Use Plan (CLUP), dated December 23, 2008, “The primary purpose of the FBFA Recovery Plan effort was to determine what is needed to restore the health, vitality, and viability of the communities in the nine impacted chapters. This includes not only the capital projects needed but also the resources and actions needed to breathe life into the vision of recovery.”

Although the Freeze was lifted in 2006 and a recovery plan was written by 2008, little development has taken place during the past 12 years. Effectively, this has become a 54-year development freeze. New studies have taken place regarding land use planning (2017) and economic feasibility (2018). These documents offer general objectives, insightful background, and detailed resource inventories and assessments. These studies lack project-specific financial information and investment projections. However, the 2018 feasibility study does provide detailed generic financial models and promotes a residual land value approach.

The Navajo Thaw Regional Recovery Plan (Building Communities, Inc. and Native Builders, LLC 2020) seeks economic development investment by itemizing actionable development projects. The Plan comprises a Summary and nine Chapter Recovery Plans (also referred to as Chapter Land use Plans).

According to the 2020 Chapter Recovery Plan, “The Navajo Thaw Implementation Plan is not just another study that will sit on the shelf. It is a commitment by the Nez-Lizer Administration and the 24th Navajo Nation Council to listen to the people in all nine Chapters, formulate Chapter-based Recovery Plans, and to create the Navajo Thaw Regional Plan. The result of this three-year Implementation Plan will be the opportunity for the federal government to meet its Promise to the Navajo Thaw Region to improve the housing, establish the infrastructure, build the public facilities and create economic conditions necessary to benefit the lives of the impacted Navajo people.”

The Bureau of Indian Affairs developed the FBFA Integrated Resource Management Plan (IRMP) in close consultation with the Navajo Nation. The early planning process involved discussions within the Navajo Nation, which identified their expectations, concerns, and recommendations for the planning effort. Through this process, it was decided that the draft IRMP would function as an update to the 2008 Recovery Plan. The IRMP is a tribal strategic, vision-based, long-term management plan based on Navajo Nation members’ interests, needs, and concerns for their lands and natural and cultural resources. In October 2020, the Navajo Nation Resources

Development Committee and the Navajo-Hopi Land Commission both approved the draft IRMP through resolutions.

The Bureau of Indian Affairs is preparing a Programmatic Environmental Assessment (PEA) to evaluate potential environmental impacts of the proposed draft IRMP for the FBFA. The PEA will be prepared in accordance with the requirements of the National Environmental Policy Act (NEPA). This economic impact analysis is a supporting component of the PEA to analyze the socioeconomic impacts of implementing the IRMP and the associated 2020 Recovery Plan.

3. Purpose of this Analysis

The purpose of this analysis is to estimate the economic impacts that would result from the implementation of the [Navajo Thaw Regional Recovery Plan](#) (2020). That plan is the starting point and framework for this economic impact and socioeconomic analysis. Details and additional information first appearing in previous studies are used in this analysis only if they can be traced to the 2020 Recovery Plan. Within the broader scope of the 2020 Recovery Plan, this study focuses on the proposed development projects and the portions of development projects falling within the FBFA.

The development projects proposed in the 2020 Recovery Plan will impact the socioeconomic conditions within the FBFA and surrounding regions. In this analysis, the impacts resulting from hundreds of proposed projects' development are summarized by chapter, category, and construction year phase. The primary socioeconomic conditions include:

- Employment and Income – The construction of new infrastructure and facilities will support and create new jobs and generate labor income.
- Demographic Trends – Housing, education, and recreational facility development will improve the quality of life for FBFA residents, promote population growth and in-migration.
- Lifestyle and Cultural Values (rural, urban) – Some projects provide “urban” amenities to rural areas, such as new clinics and health facilities. Other projects such as farm developments and tribal courts support the Navajo Nation's rural character and cultural values.
- Community Infrastructure (public services, utilities) – The construction of powerlines, waterlines, wastewater treatment facilities, road improvements, public safety buildings, and other community infrastructure projects will improve the socioeconomic conditions of current residents and create a foundation for future economic growth.

This analysis will help to inform the necessary decisions required to implement the Navajo Thaw Recovery Plan. According to the 2008 Recovery Plan itself, it was “not intended as the final word on needed projects, but rather the first word.”

4. Methodology

This study aims to estimate the economic impacts that would result from the implementation of the 2020 Recovery Plan. The IMPLAN modeling approach is used to quantify economic impacts. IMPLAN is a common standard for economic impact analysis. IMPLAN modeling also allows for project impacts to be evaluated in the context of the regional economy. Several project areas referenced in the 2020 Recovery Plan lack capital expenditure budgets and are addressed qualitatively.

This analysis quantifies the economic impacts of hundreds of projects using a common framework. The common model output format allows for easy comparisons and summation. Comparing project proposals with actual demographics, for example, comparing the number of proposed housing units to the actual population, allows projects to be refined to meet the community's needs in the most efficient manner.

Except for the Little Colorado River Farms Project, the projects identified in the Recovery Plans do not include operating and maintenance budgets. Thus, except for the one exception, the projects' ongoing operating and maintenance impacts are not considered.

4.1 IMPLAN

Input-Output (I-O) modeling is based on the foundational concept that all industries, households, and government in the economy are connected through buy-sell relationships; therefore a given economic activity supports a ripple of additional economic activity throughout the economy. IMPLAN is an I-O modeling system that uses annual, regional data to map these buy-sell relationships so users can predict how specific economic changes will impact a given regional economy or estimate the effect of past or existing economic activity.

This analysis is based on the IMPLAN input-output economic model that incorporates all available economic data for each county in the country, including from the U.S. Census, Internal Revenue Services, Bureau of Labor Statistics, and others. IMPLAN was initially conceived in 1972 as part of the Rural Development Act of 1972. After initial development by the U.S. Forest Service, IMPLAN was further developed by the University of Minnesota during the 1980s. In the 1990s, IMPLAN was privatized, and the Minnesota IMPLAN Group (MIG, Inc.) began taking commercial orders. IMPLAN is now widely used for modeling economic impacts across many business sectors.

This analysis uses the latest version of IMPLAN, which now operates based on 546 industry sectors as defined by the Bureau of Economic Analysis (BEA). The latest BEA datasets are from 2018—"data year" of this IMPLAN model.

For a particular producing industry, multipliers estimate three components of total change within the local area:

- **Direct effects** represent the initial change in the industry in question. For example, building a new facility to generate electricity from solar energy will directly expand the size of that industry within the region it is located.
- **Indirect effects** are changes in inter-industry transactions as supplying industries respond to increased demands from the directly affected industries.
- **Induced effects** reflect changes in local spending that result from income changes in the directly and indirectly affected industry sectors.

Developing an IMPLAN model for this project required specifying a region of impact, identifying representative industry sectors, and selecting which years the impacts will occur. Data inputs also include estimates of capital expenditures. IMPLAN regions can either be states, counties, or groups of states or counties. As the FBFA falls entirely within Coconino County, this analysis is conducted using Coconino County, Arizona, as the IMPLAN region.

4.1.1 Description of IMPLAN Model Output and Estimates of Economic Impacts

Each economic impact table shows the total amount of direct capital spending. This is the IMPLAN model output broken down by the following components: labor income, intermediate expenses, and taxes/profits. Using IMPLAN terminology, “taxes/profits” refers to the combination of Taxes on Production and Imports (TOPI) and Other Property Income (OPI), both of which are defined in the Glossary. The number of 1-year jobs is also shown as either total jobs assuming the capital expense occurs in a single year or as an average number of annual jobs for projects and/or groups of projects occurring over several years. In addition to the direct impacts, each impact table shows the indirect and induced impacts. Finally, the total impact line sums the direct, indirect, and induced impacts. See Glossary for additional definitions.

For each of the Chapter-specific, Infrastructure Capital Improvement Plan, and Immediate Recovery project groups, detailed tax revenue impacts and breakdowns of the top 15 industries by impact and breakdowns of the top 15 industries by impact are shown.

4.2 Documents Reviewed for Data Inputs

The reports listed below represent the sole source of data inputs for the IMPLAN model.

- Former Bennett Freeze Area Recovery Plan – 2008
- Community-Based Land-Use Plans for each Chapter – 2017
- Former Bennett Freeze Area Economic and Market Feasibility Study – 2018
- Former Bennett Freeze Area Draft Integrated Resource Management Plan – 2020
- Chapter Recovery Plan Drafts - 2020
- Navajo Thaw Regional Recovery Plan - 2020

4.3 Dollar Years

The budgets for the Chapter-specific project proposals listed in the 2008 Recovery Plan are based on 2010 dollars, the anticipated first year of construction. Section 5.1 describes the organization of these project capital budgets in terms of 2010 dollars.

Further, for these projects, the 2010 dollar values were entered into IMPLAN as inputs. The economic impact results are all presented in 2021 dollars. In these cases, IMPLAN has adjusted the dollar amounts to account for inflation. All of the dollar figures in the tables showing IMPLAN inputs and economic impacts estimated by this analysis are presented in 2021 dollars.

The Infrastructure Capital Improvement Plan project budgets have all been input into IMPLAN as 2020 dollars. Their impact results also show in 2021 dollars. The same is true for the Immediate Recovery Projects.

Both the Chapter-specific and Infrastructure Capital Improvement Plan project plans anticipate phasing construction over future years. For consistency, all of the future year budget and economic impact estimates are presented in 2021 dollars. The reader should be aware that actual future expenditure amounts will vary depending on the number of years in the future and the rate of inflation.

4.4 Disclaimer

Actual economic impacts occurring in the future will depend on final project specifications and economic conditions prevailing at the time of development. The exercise of setting up IMPLAN models requires assumptions such as which economic sector to specify. Although IMPLAN is a very sophisticated model incorporating all of the publicly available data at the county level, it also provides estimates based on a number of assumptions.

All of the projects modeled in this study are based on data identified in documents listed in Section 4.2. Many project budgets appear to be rough estimates that are several years old. This analysis estimates economic impacts based on all of the quantifiable data made available. Additional information, such as detailed capital expenditure budgets, construction plans, pro formas, and operating budgets, would improve results.

5. Regional and Chapter-Specific Projects

5.1 Organization of Capital Expenditure Budgets

The 2020 Recovery Plan lists Regional Projects totaling \$447 million and Chapter-Specific Projects totaling \$4.3 billion for a combined total of \$4.74 billion (2010 dollars). The 2020 Recovery Plan cites the 2008 Recovery Plan as the source of these budgets.

5.1.1 The 2008 Recovery Plan

Specifically, the Chapter Land Use Plans appearing in Appendix 7.5 of the 2008 Recovery Plan provide a modest level of detail and description for each project. Further, Appendix 7.12 in the 2008 Recovery Plan organizes project lists by chapter and includes a category for “Regional.” Appendix 7.13 organizes projects by category. In comparison to the 2020 Recovery Plan, the 2008 Recovery Plan categorization has a greater volume of Regional Projects at \$871 million and a lesser total for Chapter-specific projects at \$3.9 billion totaling \$4.79 billion. After careful comparison and resolution of minor discrepancies, it is clear that both reports reference the same set of projects, and in most cases, dollar for dollar.

5.1.2 Chapter-Specific Project Categories

This analysis adopts a modified version of the 2008 Recovery Plan categorization scheme to provide the greatest level of detail and improve forecast model results (see Table 5-1 **Error! Reference source not found.**). A master database was created to organize this information and summarize inputs for IMPLAN modeling. Housing is broken into three categories, given the size of the total housing budget.

Table 5-1. Regional and Chapter-Specific Project Categories

Chapter-Specific Project Categories
Community Facilities and Recreation
Education
Multifamily Housing
Housing Repairs
Scattered Housing
Health
Infrastructure
Public Safety
Transportation

Note that none of the projects listed as Agricultural in the 2008 Recovery Plan are capital projects and therefore not modeled as having economic impacts as described in Section 5.1.6.

5.1.3 Proposed Studies

Many of the itemized Chapter-specific projects are proposed studies to assess market and economic feasibility, determine environmental impacts, identify water sources, and similar investigations. There are 105 of these items

for a total budget of \$16,335,000 in 2010 dollars. Individuals budget amounts range from \$10,000 to \$1 million, with most of the studies budgeted at either a \$50,000 or \$200,000 level. Since these studies likely would be conducted by experts from outside of the region, these expenditures would not impact the local economy. Therefore, these research expenditures are excluded from IMPLAN model inputs.

5.1.4 Share of Project Costs within FBFA Boundary

For most projects, the proportion of the project that lies within the FBFA is given as a percentage. For the project listings not showing an FBFA percentage, this analysis assumes the project to be entirely within the FBFA. This is the case for all of the infrastructure projects. Budget amounts have been adjusted by these proportions so that only the values within the FBFA are used as IMPLAN inputs. For example, the IMPLAN input for an \$8 million project that is 60 percent in the FBFA is \$4.8 million.

5.1.5 Furniture, Fixtures, and Equipment Expenditures

The Chapter-Specific Project budgets include a line item for FFE. The total amount of FFE budgeted is \$222 million, of which \$95 million falls within the FBFA boundary (2010 dollars).

Since FFE items are often manufactured outside of the local county (in many cases overseas), their production does not impact the local economy. Therefore, FFE expenditures are excluded from IMPLAN model inputs. FFE purchases from vendors within the county and/or Navajo Nation may be subject to local sales tax.

5.1.6 Total Adjusted Chapter-Specific Capital Budget

The initial Chapter-specific project list includes 357 unique projects. After removing the study-only projects, the total proposed capital expenditure less FFE is \$4.55 billion. After further removing the projects falling entirely outside of the FBFA boundary, there are 206 projects within the FBFA boundary for a total amount of \$2.2 billion in 2010 dollars.

The total capital budget of these 206 projects combined is \$3 billion in 2021 dollars. Sections 5.2 – 5.3 estimate the economic impact of this budget broken down by chapter and category with a year of construction.

5.2 Economic Impact of Chapter-Specific Projects per Chapter

There are ten subsections within Section 5-2, one for each of the nine FBFA chapters and one for regional projects. For each subsection there is a categorized list of projects by name, a total budget for each project category, and the share of the budget within the FBFA. Tables showing IMPLAN model inputs and economic impact outputs are also presented in each subsection. Attachment A shows the impact of each project category within each chapter.

5.2.1 Bodaway Gap

This analysis models a total of 29 Bodaway Gap Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category:

- Animal Shelter – Bitter Springs
- Park and ballfields

- Picnic ground
- Post Office
- Recreation/Wellness Center
- Veterans Center
- Animal Shelter - Gap
- Chapter House - renovation
- Football Field/track
- Multipurpose Center

Education

- Daycare – Bitter Springs
- Daycare – Cedar Ridge
- Daycare
- K-12
- Lifelong Learning Center
- New Head Start

Housing

- New Scattered Residential 284 houses at 1,200 sq. ft. each
- New Elder Living
- New Group Residential, Women's Shelter, Special Needs
- New Cluster Residential 177 houses at 1,200 sq. ft. each
- New Multifamily 16 units at 1,200 sq. ft each.
- Repair Multifamily 8 units at 1,200 sq. ft.
- Repair Residential 148 existing houses at 1,200 sq. ft. each
- Power and Water Upgrades 57 existing houses at 1,200 sq. ft. each

Health

- New Health Care Facilities

Infrastructure

- Active and inactive water and wastewater projects – 134 homes
- Unfunded water, wastewater projects – 401 Homes

Public Safety

- Fire Stations
- Police Station

Table 5-2. Bodaway Gap Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$32,490,526	\$29,566,379	10
Education	\$80,702,272	\$73,439,068	6
Multifamily Housing	\$172,476,224	\$160,824,119	4
Scattered Housing	\$217,489,491	\$205,890,052	1
Housing Repairs	\$46,759,716	\$38,768,122	3
Health	\$45,944,788	\$41,809,757	1
Infrastructure	\$9,608,856	\$9,608,856	2
Public Safety	\$11,941,823	\$10,867,059	2
Total	\$617,413,696	\$570,773,410	29

Table 5-3. Inputs for the Bodaway Gap Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$29,566,379
Education	Construct. of new educational structures	53	\$73,439,068
Multifamily Housing	Construct. of new multifamily structures	58	\$160,824,119
Scattered Housing	Construct. of new single-family structures	57	\$205,890,052
Housing Repairs	Repair of residential structure	61	\$38,768,122
Health	Construct. of new health care structures	50	\$41,809,757
Infrastructure	Construction of nonresidential structures	56	\$9,608,856
Public Safety	Construct. of new commercial structures	55	\$10,867,059
Total			\$570,773,410

Table 5-4. Total Economic Impact of Bodaway Gap Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	4,758	\$234,684,658	\$240,144,660	\$95,944,093	\$570,773,410
Indirect	725	\$32,669,854	\$49,081,499	\$24,424,437	\$106,175,790
Induced	969	\$43,312,175	\$55,972,742	\$37,160,431	\$136,445,349
Total	6,451	\$310,666,688	\$345,198,901	\$157,528,961	\$813,394,550

5.2.2 Cameron

This analysis models a total of 24 Cameron Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Animal Shelter
- Chapter House, Community Center
- Multipurpose Center
- Park and ballfields
- Senior Center
- Sports Complex - indoor
- Veterans Center

Education

- Daycare
- K-12
- Lifelong Learning Center
- New Head Start

Housing

- New Cluster Residential 129 houses at 1,200 sq. ft. each
- New Elder Living facility
- New Group Residential, Women's Shelter, Special Needs
- New Multifamily 18 units at 1,200 sq. ft. each.
- New Scattered Residential 207 houses at 1,200 sq. ft. each
- Power & Water Upgrades 41 existing houses at 1,200 sq. ft. each
- Repair Residential 108 existing houses at 1,200 sq. ft. each

Health

- New Health Care Facilities

Infrastructure

- Active and inactive water and wastewater projects – 88 homes
- Unfunded water, wastewater projects – 309 homes
- Unfunded water, wastewater projects – 58 homes

Public Safety

- Fire Stations
- Police Station

Table 5-5. Cameron Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$33,238,563	\$33,238,563	7

Event	Total Budget	Total in FBFA	# in FBFA
Education	\$80,752,939	\$80,752,939	4
Multifamily Housing	\$137,167,316	\$137,167,316	4
Scattered Housing	\$150,067,749	\$150,067,749	1
Housing Repairs	\$27,035,265	\$27,035,265	2
Health	\$53,316,459	\$53,316,459	1
Infrastructure	\$13,593,903	\$13,593,903	3
Public Safety	\$11,941,823	\$11,941,823	2
Total	\$507,114,017	\$507,114,017	24

Table 5-6. Inputs for the Cameron Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$33,238,563
Education	Construct. of new educational structures	53	\$80,752,939
Multifamily Housing	Construct. of new multifamily structures	58	\$137,167,316
Scattered Housing	Construct. of new single-family structures	57	\$150,067,749
Housing Repairs	Repair of residential structure	61	\$27,035,265
Health	Construct. of new health care structures	50	\$53,316,459
Infrastructure	Construction of nonresidential structures	56	\$13,593,903
Public Safety	Construct. of new commercial structures	55	\$11,941,823
Total			\$507,114,017

Table 5-7. Total Economic Impact of Cameron Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	4,251	\$210,384,026	\$212,673,903	\$84,056,088	\$507,114,017
Indirect	603	\$27,438,798	\$42,114,343	\$20,253,795	\$89,806,937
Induced	860	\$38,514,290	\$49,772,363	\$33,044,731	\$121,331,384
Total	5,714	\$276,337,115	\$304,560,609	\$137,354,615	\$718,252,338

5.2.3 Coalmine Canyon

This analysis models a total of 21 Coalmine Canyon Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Veterans Center

- Multipurpose Center/Museum
- Park and ballfields
- Post Office
- Rec. Trails

Education

- K-12
- Lifelong Learning Center
- New Head Start

Housing

- New Cluster Residential 50 houses at 1,200 sq. ft. each
- New Elder Living 42 existing houses at 1,200 sq. ft. each
- New Group Residential, Independent Living, Nursing
- New Multifamily, Special Needs, Transitional Students
- New Scattered Residential 80 units at 1,200 sq. ft. each.
- Power & Water Upgrades 80 houses at 1,200 sq. ft. each
- Repair Residential 16 existing houses at 1,200 sq. ft. each

Health

- Clinic

Infrastructure

- Active and inactive water and Wastewater projects - 108 homes
- Unfunded water, wastewater projects - 263 homes

Public Safety

- Tribal Court
- Fire Stations
- Police Station

Table 5-8. Coalmine Canyon Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$26,900,005	\$26,900,005	5
Education	\$33,058,900	\$33,058,900	3
Multifamily Housing	\$79,528,766	\$79,528,766	4
Scattered Housing	\$57,997,198	\$57,997,198	1
Housing Repairs	\$10,520,785	\$10,520,785	2

Event	Total Budget	Total in FBFA	# in FBFA
Health	\$5,893,513	\$5,893,513	1
Infrastructure	\$2,444,665	\$2,444,665	2
Public Safety	\$17,690,363	\$17,690,363	3
Total	\$234,034,194	\$234,034,194	21

Table 5-9. Inputs for the Coalmine Canyon Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$26,900,005
Education	Construct. of new educational structures	53	\$33,058,900
Multifamily Housing	Construct. of new multifamily structures	58	\$79,528,766
Scattered Housing	Construct. of new single-family structures	57	\$57,997,198
Housing Repairs	Repair of residential structure	61	\$10,520,785
Health	Construct. of new health care structures	50	\$5,893,513
Infrastructure	Construction of nonresidential structures	56	\$2,444,665
Public Safety	Construct. of new commercial structures	55	\$17,690,363
Total			\$234,034,194

Table 5-10. Total Economic Impact of Coalmine Canyon Chapter-specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	2,029	\$99,653,310	\$95,464,752	\$38,916,132	\$234,034,194
Indirect	269	\$12,199,465	\$18,836,697	\$8,957,803	\$39,993,964
Induced	404	\$18,116,072	\$23,411,579	\$15,542,866	\$57,070,516
Total	2,702	\$129,968,846	\$137,713,028	\$63,416,800	\$331,098,675

5.2.4 Coppermine

This analysis models a total of 16 Coppermine chapter-specific plan projects. They are listed by category below.

Community Facility and Recreation Category

- Multipurpose Center
- Post Office
- Veterans Center

Education

- Lifelong Learning Center
- Mid/High School
- New Head Start

Housing

- Repair Residential 28 existing houses at 1,200 sq. ft. each
- Power & Water Upgrades 11 existing houses at 1,200 sq. ft. each
- New Cluster Residential 33 houses at 1,200 sq. ft. each
- New Multifamily 5 units at 1,200 sq. ft each.
- New Elder Living, Disabled, Nursing
- New Group Residential, Women's Shelter
- New Scattered Residential 53 houses at 1,200 sq. ft. each

Health

- Clinic

Public Safety

- Fire Stations
- Police and Fire Station

Table 5-11. Coppermine Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$7,962,065	\$3,742,171	3
Education	\$18,096,958	\$8,505,570	3
Multifamily Housing	\$56,461,431	\$31,116,324	4
Scattered Housing	\$63,796,917	\$38,423,143	1
Housing Repairs	\$24,431,330	\$7,056,279	2
Health	\$5,893,513	\$2,769,951	1
Infrastructure	\$0	\$0	0
Public Safety	\$19,404,347	\$9,120,043	2
Total	\$196,046,562	\$100,733,482	16

Table 5-12. Inputs for the Coppermine Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$3,742,171
Education	Construct. of new educational structures	53	\$8,505,570

Event	Industry Sector Description	Sector	Cap Ex Budget
Multifamily Housing	Construct. of new multifamily structures	58	\$31,116,324
Scattered Housing	Construct. of new single-family structures	57	\$38,423,143
Housing Repairs	Repair of residential structure	61	\$7,056,279
Health	Construct. of new health care structures	50	\$2,769,951
Infrastructure	Construction of nonresidential structures	56	\$0
Public Safety	Construct. of new commercial structures	55	\$9,120,043
Total			\$100,733,482

Table 5-13. Total Economic Impact of Coppermine Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	847	\$41,495,459	\$42,259,726	\$16,978,297	\$100,733,482
Indirect	130	\$5,857,263	\$8,730,470	\$4,395,017	\$18,982,750
Induced	173	\$7,673,878	\$9,917,035	\$6,583,697	\$24,174,610
Total	1,149	\$55,026,599	\$60,907,231	\$27,957,012	\$143,890,842

5.2.5 Kaibeto

This analysis models a total of 22 Kaibeto Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Chapter House - renovation
- Multipurpose Center
- Recreation Center

Education

- Daycare
- K-12
- Lifelong Learning Center
- New Head Start

Housing

- New Scattered Residential 27 houses at 1,200 sq. ft. each
- New Cluster Residential 17 houses at 1,200 sq. ft. each
- New Multifamily 2 units at 1,200 sq. ft each.
- New Elder Living
- New Group Residential facility

- Repair Residential 14 existing houses at 1,200 sq. ft. each
- Power & Water Upgrades 5 existing houses at 1,200 sq. ft. each

Health

- Clinic
- Urgent Care

Infrastructure

- Active and inactive water and Wastewater projects – 58 homes
- Active and inactive water and Wastewater projects – 86 homes
- Unfunded water, wastewater projects – 185 homes
- Unfunded water, wastewater projects – 36 homes

Public Safety

- Fire Stations
- Police Station

Table 5-14. Kaibeto Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$23,433,805	\$2,109,042	3
Education	\$80,752,939	\$7,267,765	4
Multifamily Housing	\$126,671,208	\$15,913,525	4
Scattered Housing	\$131,218,660	\$19,574,054	1
Housing Repairs	\$80,170,479	\$3,464,506	2
Health	\$8,131,662	\$731,850	2
Infrastructure	\$11,517,150	\$11,517,150	4
Public Safety	\$11,941,823	\$1,074,764	2
Total	\$473,837,727	\$61,652,656	22

Table 5-15. Inputs for the Kaibeto Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$2,109,042
Education	Construct. of new educational structures	53	\$7,267,765
Multifamily Housing	Construct. of new multifamily structures	58	\$15,913,525
Scattered Housing	Construct. of new single-family structures	57	\$19,574,054
Housing Repairs	Repair of residential structure	61	\$3,464,506
Health	Construct. of new health care structures	50	\$731,850

Event	Industry Sector Description	Sector	Cap Ex Budget
Infrastructure	Construction of nonresidential structures	56	\$11,517,150
Public Safety	Construct. of new commercial structures	55	\$1,074,764
Total			\$61,652,656

Table 5-16. Total Economic Impact of Kaibeto Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	560	\$27,560,797	\$27,319,044	\$6,772,815	\$61,652,656
Indirect	79	\$3,604,143	\$5,469,286	\$2,674,746	\$11,748,175
Induced	113	\$5,047,335	\$6,522,718	\$4,330,510	\$15,900,563
Total	751	\$36,212,275	\$39,311,048	\$13,778,071	\$89,301,394

5.2.6 Leupp

This analysis models a total of 17 Leupp Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Animal Shelter
- Chapter House - renovation
- Post Office
- Recreation Center

Education

- Daycare
- K-12
- Lifelong Learning Center

Housing

- New Cluster Residential 2 houses at 1,200 sq. ft. each
- Power and Water Upgrades 1 existing home at 1,200 sq. ft. each
- Repair Residential 1 existing houses at 1,200 sq. ft. each
- Repair Multifamily 8 units at 1,200 sq. ft.
- New Scattered Residential 3 houses at 1,200 sq. ft. each
- New Elder Living, Senior Center
- New Group Residential facility

Health

- New Health Care Facilities

Public Safety

- Fire Stations
- Police Station

Table 5-17. Leupp Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$25,489,312	\$254,893	4
Education	\$32,135,495	\$321,355	3
Multifamily Housing	\$125,726,558	\$1,667,873	3
Scattered Housing	\$121,069,150	\$2,174,895	1
Housing Repairs	\$83,911,742	\$1,945,375	3
Health	\$33,052,429	\$330,524	1
Infrastructure	\$0	\$0	0
Public Safety	\$11,941,823	\$119,418	2
Total	\$433,326,509	\$6,814,334	17

Table 5-18. Inputs for the Leupp Chapter-specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct new commercial structures	55	\$254,893
Education	Construct new educational structures	53	\$321,355
Multifamily Housing	Construct new multifamily structures	58	\$1,667,873
Scattered Housing	Construct new single-family structures	57	\$2,174,895
Housing Repairs	Repair of residential structure	61	\$1,945,375
Health	Construct new health care structures	50	\$330,524
Infrastructure	Construct nonresidential structures	56	\$0
Public Safety	Construct new commercial structures	55	\$119,418
Total			\$6,814,334

Table 5-19. Total Economic Impact of Leupp Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	50	\$2,511,696	\$3,155,473	\$1,147,165	\$6,814,334

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Indirect	10	\$461,526	\$670,772	\$357,111	\$1,489,409
Induced	10	\$482,131	\$623,063	\$413,641	\$1,518,835
Total	72	\$3,455,353	\$4,449,308	\$1,917,918	\$9,822,579

5.2.7 Tolani Lake

This analysis models a total of 21 Tolani Lake Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Chapter House – renovation
- Veterans Center
- Multipurpose Center
- Outdoor Recreation Center
- Playground
- Post Office
- Recreation Center

Education

- K-12
- Lifelong Learning Center
- New Head Start

Housing

- Repair Residential 33 existing houses at 1,200 sq. ft. each
- Power and Water Upgrades 13 existing houses at 1,200 sq. ft. each
- New Cluster Residential 40 houses at 1,200 sq. ft. each
- New Multifamily 5 units at 1,200 sq. ft each.
- New Elder Living, Nursing, Convalescence, Elder
- New Group Residential, Emergency Shelter
- New Scattered Residential 64 houses at 1,200 sq. ft. each

Health

- Clinic
- Urgent Care

Public Safety

- Fire Stations

- Police Station

Table 5-20. Tolani Lake Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$27,628,034	\$13,537,737	7
Education	\$28,967,546	\$14,194,097	3
Multifamily Housing	\$61,037,734	\$35,686,177	4
Scattered Housing	\$75,396,357	\$46,397,758	1
Housing Repairs	\$28,097,848	\$8,320,874	2
Health	\$6,318,917	\$3,096,269	2
Infrastructure	\$0	\$0	0
Public Safety	\$11,941,823	\$5,851,493	2
Total	\$239,388,259	\$127,084,406	21

Table 5-21. Inputs for the Tolani Lake Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct new commercial structures	55	\$13,537,737
Education	Construct new educational structures	53	\$14,194,097
Multifamily Housing	Construct new multifamily structures	58	\$35,686,177
Scattered Housing	Construct new single-family structures	57	\$46,397,758
Housing Repairs	Repair residential structure	61	\$8,320,874
Health	Construct new health care structures	50	\$3,096,269
Infrastructure	Construct nonresidential structures	56	\$0
Public Safety	Construct new commercial structures	55	\$5,851,493
Total			\$127,084,406

Table 5-22. Total Economic Impact of Tolani Lake Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1,064	\$52,151,840	\$53,850,349	\$21,082,217	\$127,084,406
Indirect	160	\$7,254,325	\$10,925,331	\$5,419,424	\$23,599,080
Induced	216	\$9,625,447	\$12,439,064	\$8,258,156	\$30,322,667
Total	1,440	\$69,031,612	\$77,214,744	\$34,759,797	\$181,006,153

5.2.8 Tonalea

This analysis models a total of 22 Tonalea Chapter-specific projects. They are listed by category below.

Community Facility and Recreation Category

- Animal Shelter
- Multipurpose Center – renovation
- Park and ballfields
- Recreation Center
- Veterans Center

Education

- Daycare
- K-12
- Lifelong Learning Center
- New Head Start

Housing

- Repair Residential 61 existing houses at 1,200 sq. ft. each
- Power and Water Upgrades 23 existing houses at 1,200 sq. ft. each
- New Cluster Residential 73 houses at 1,200 sq. ft. each
- New Multifamily 10 units at 1,200 sq. ft. each.
- New Elder Living, Nursing, Elder
- New Group Residential, Veteran's, Women's Shelter
- New Scattered Residential 116 houses at 1,200 sq. ft. each

Health

- Clinic

Infrastructure

- Active and inactive water and wastewater projects - 18 homes
- Unfunded water, wastewater projects

Public Safety

- Tribal Court
- Fire Stations
- Police Station

Table 5-23. Tonalea Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$23,473,692	\$6,572,634	5
Education	\$36,919,719	\$10,337,521	4
Multifamily Housing	\$181,077,360	\$64,270,190	4
Scattered Housing	\$211,689,772	\$84,095,937	1
Housing Repairs	\$102,603,911	\$15,249,885	2
Health	\$7,706,259	\$2,157,752	1
Infrastructure	\$8,964,671	\$8,964,671	2
Public Safety	\$17,690,363	\$4,953,302	3
Total	\$590,125,746	\$196,601,892	22

Table 5-24. Inputs for the Tonalea Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct. of new commercial structures	55	\$6,572,634
Education	Construct. of new educational structures	53	\$10,337,521
Multifamily Housing	Construct. of new multifamily structures	58	\$64,270,190
Scattered Housing	Construct. of new single-family structures	57	\$84,095,937
Housing Repairs	Repair of residential structure	61	\$15,249,885
Health	Construct. of new health care structures	50	\$2,157,752
Infrastructure	Construction of nonresidential structures	56	\$8,964,671
Public Safety	Construct. of new commercial structures	55	\$4,953,302
Total			\$196,601,892

Table 5-25. Total Economic Impact of Tonalea Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1,691	\$82,688,177	\$83,011,425	\$30,902,290	\$196,601,892
Indirect	269	\$12,058,108	\$17,659,993	\$9,123,218	\$38,841,319
Induced	343	\$15,357,287	\$19,846,393	\$13,175,426	\$48,379,106
Total	2,303	\$110,103,572	\$120,517,811	\$53,200,934	\$283,822,317

5.2.9 Tuba City

This analysis models a total of 19 Tuba City chapter-specific plan projects. They are listed by category below.

Community Facility and Recreation Category

- Animal Shelter – expand/upgrade
- Recreation Center
- Youth Center
- Animal Shelter – new boarding and vet clinic
- Chapter House – renovation
- Park and ballfields

Education

- Daycare
- Lifelong Learning Center

Housing

- New Cluster Residential 178 houses at 1,200 sq. ft. each
- New Elder Living, Nursing
- New Group Residential Woman's Shelter, Student Housing, Detox Center
- Power & Water Upgrades 57 existing houses at 1,200 sq. ft. each
- Repair Residential 149 existing houses at 1,200 sq. ft. each
- Repair Multifamily 43 units at 1,200 sq. ft. each.
- New Scattered Residential 286 houses at 1,200 sq. ft. each

Infrastructure

- Active and inactive water and Wastewater projects – 137 homes
- Unfunded water, wastewater projects – 1,372 homes

Public Safety

- Fire Stations
- Police Station

Table 5-26. Tuba City Chapter-Specific Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Community Facilities and Recreation	\$52,893,955	\$10,578,791	6
Education	\$13,863,736	\$2,772,747	2
Multifamily Housing	\$561,329,241	\$138,711,842	3

Event	Total Budget	Total in FBFA	# in FBFA
Scattered Housing	\$706,840,847	\$207,339,982	1
Housing Repairs	\$388,475,123	\$46,040,553	3
Health	\$0	\$0	0
Infrastructure	\$4,195,283	\$4,195,283	2
Public Safety	\$23,837,770	\$4,767,554	2
Total	\$1,751,435,955	\$414,406,752	19

Table 5-27. Inputs for the Tuba City Chapter-Specific Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Community Facilities and Recreation	Construct new commercial structures	55	\$10,578,791
Education	Construct new educational structures	53	\$2,772,747
Multifamily Housing	Construct new multifamily structures	58	\$138,711,842
Scattered Housing	Construct new single-family structures	57	\$207,339,982
Housing Repairs	Repair residential structure	61	\$46,040,553
Health	Construct new health care structures	50	\$0
Infrastructure	Construct of nonresidential structures	56	\$4,195,283
Public Safety	Construct new commercial structures	55	\$4,767,554
Total			\$414,406,752

Table 5-28. Total Economic Impact of Tuba City Chapter-Specific Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	3,464	\$168,728,341	\$176,032,301	\$69,646,111	\$414,406,752
Indirect	611	\$27,063,095	\$38,779,573	\$20,752,070	\$86,594,738
Induced	711	\$31,752,140	\$41,033,673	\$27,240,168	\$100,025,981
Total	4,786	\$227,543,576	\$255,845,546	\$117,638,349	\$601,027,472

5.2.10 Regional

This analysis models a total of 15 Regional Chapter-specific projects. They are listed by category below.

Regarding transportation, to the extent that some or all of the projects have been completed already, future maintenance of other roads will still be required. Thus, the road projects showing below should be considered representative.

Health

- Renovate and Expand Tuba City Regional Hospital
- Tuba City Health Center – Emergency Repairs

Infrastructure

- Western Navajo Pipeline
- Pipeline – C-aquifer Leupp to Dilcon

Transportation

- Route N101
- Route N609/N614 Project No. N609(1-1)2,4
- Route N619, Project No. N619(1)2,4
- Route N6331/N6330, Project No. N6731 (1)1,2,3
- Route N101, Project No. N101(8)2&4
- Route N101, Project No. N101(9)2&4
- Route N101, Project No. N101(9)2&4
- Route N20, Project No. N20(3)2,5 – Phase 1
- Route N20, Project No. N20(3)2,6 – Phase 2
- Route N20, Project No. N20(3)2,6 – Phase 3
- Route N609 Project No. N609(2)2,4

Table 5-29. Regional Project Budgets

Event	Total Budget	Total in FBFA	# in FBFA
Housing	\$27,314,017	\$6,268,884	1
Hospital	\$314,778,378	\$69,251,243	1
Infrastructure	\$582,528,447	\$582,528,447	2
Transportation	\$112,848,195	\$112,559,122	11
Total	\$1,037,469,037	\$770,607,696	15

Table 5-30. Inputs for the Regional Projects

Event	Industry Sector Description	Sector	Cap Ex Budget
Housing	Repair of nonresidential structures	60	\$6,268,884
Hospital	Construct new health care structures	50	\$69,251,243
Infrastructure	Construct of nonresidential structures	56	\$582,528,447
Transportation	Maintenance of highways and streets	62	\$112,559,122
Total			\$770,607,696

Table 5-31. Total Economic Impact of Regional Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	8,614	\$427,947,073	\$439,112,893	(\$96,452,269)	\$770,607,696
Indirect	1,020	\$48,410,089	\$77,769,737	\$34,392,286	\$160,572,112
Induced	1,725	\$77,087,741	\$99,621,114	\$66,142,085	\$242,850,940
Total	11,359	\$553,444,903	\$616,503,743	\$4,082,102	\$1,174,030,748

5.3 Chapter-Specific Projects by Category and Phasing

There are nine subsections within Section 5.2.10, one for each project category. Within each subsection, there is a budget schedule allocating annual portions over a seven-year development horizon. The annual average of all projects is used to determine the allocation. Future event years remain modeled in 2021 dollars, noting that actual future capital expenditures will increase with inflation. IMPLAN model inputs and economic impact outputs are also presented in each subsection. Attachment B shows the annual impact of each project category for each of the seven years.

5.3.1 Community Facilities and Recreation

There are 50 individual Chapter-Specific Projects categorized as Community Facilities and Recreation.

Table 5-32. Inputs for the Chapter-Specific Community Facilities and Recreation

Year	Industry Sector Description	Cap Ex Budget
2021	Construct new commercial structures	\$2,194,521
2022	Construct new commercial structures	\$15,324,688
2023	Construct new commercial structures	\$22,055,941
2024	Construct new commercial structures	\$28,380,764
2025	Construct new commercial structures	\$25,277,392
2026	Construct new commercial structures	\$22,759,928
2027	Construct new commercial structures	\$10,506,979
Total	Construct new commercial structures	\$126,500,213

Table 5-33. Total Economic Impact of Chapter-Specific Community Facilities and Rec

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	153	\$50,916,858	\$63,890,718	\$11,692,637	\$126,500,213
Indirect	14	\$5,071,194	\$9,440,646	\$3,316,841	\$17,828,681
Induced	29	\$9,067,650	\$11,718,236	\$7,779,067	\$28,564,953

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Total	196	\$65,055,702	\$85,049,600	\$22,788,545	\$172,893,847

5.3.2 Education

There are 32 individual Chapter-Specific Projects categorized as Education.

Table 5-34. Inputs for the Chapter-Specific Education Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Construct new educational structures	\$4,001,307
2022	Construct new educational structures	\$27,941,760
2023	Construct new educational structures	\$40,214,966
2024	Construct new educational structures	\$51,747,124
2025	Construct new educational structures	\$46,088,694
2026	Construct new educational structures	\$41,498,561
2027	Construct new educational structures	\$19,157,552
Total	Construct new educational structures	\$230,649,964

Table 5-35. Total Economic Impact of Chapter-Specific Education Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	254	\$93,579,661	\$94,331,367	\$42,738,936	\$230,649,964
Indirect	24	\$8,148,667	\$15,317,178	\$5,499,941	\$28,965,785
Induced	52	\$16,390,061	\$21,180,765	\$14,069,703	\$51,640,529
Total	330	\$118,118,389	\$130,829,310	\$62,308,580	\$311,256,278

5.3.3 New Scattered Housing

Each chapter includes a New Scattered Housing project; however, each project contains many housing units. The Chapter-Specific Projects budget for a total of 1,120 housing units at 1,200 sq ft each.

Table 5-36. Inputs for the Chapter-Specific New Scattered Housing Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Construct new single-family structures	\$14,085,866
2022	Construct new single-family structures	\$98,363,827
2023	Construct new single-family structures	\$141,569,392

Year	Industry Sector Description	Cap Ex Budget
2024	Construct new single-family structures	\$182,166,229
2025	Construct new single-family structures	\$162,246,770
2026	Construct new single-family structures	\$146,088,048
2027	Construct new single-family structures	\$67,440,636
Total	Construct new single-family structures	\$811,960,768

Table 5-37. Total Economic Impact of Chapter-Specific New Scattered Housing Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	888	\$303,069,432	\$390,476,671	\$118,414,664	\$811,960,768
Indirect	198	\$61,089,298	\$85,902,365	\$47,270,469	\$194,262,133
Induced	189	\$59,092,584	\$76,366,045	\$50,695,901	\$186,154,530
Total	1,275	\$423,251,315	\$552,745,081	\$216,381,034	\$1,192,377,430

5.3.4 New Multifamily and Clustered Housing

Each chapter includes several New Multifamily and Clustered Housing projects; however, each project contains many housing units. The Chapter-Specific Projects budget for a total of 797 housing units at 1,200 sq ft each.

Table 5-38. Inputs for the Chapter-Specific New Multifamily Housing Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Construct new multifamily structures	\$11,534,421
2022	Construct new multifamily structures	\$80,546,680
2023	Construct new multifamily structures	\$115,926,200
2024	Construct new multifamily structures	\$149,169,522
2025	Construct new multifamily structures	\$132,858,177
2026	Construct new multifamily structures	\$119,626,369
2027	Construct new multifamily structures	\$55,224,766
Total	Construct new multifamily structures	\$664,886,135

Table 5-39. Total Economic Impact of Chapter-Specific New Multifamily Housing Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	994	\$340,045,355	\$175,397,006	\$149,443,773	\$664,886,135
Indirect	94	\$29,308,693	\$42,749,557	\$21,384,713	\$93,442,963

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Induced	191	\$59,849,333	\$77,344,103	\$51,342,238	\$188,535,675
Total	1,279	\$429,203,382	\$295,490,666	\$222,170,725	\$946,864,773

5.3.5 Housing Repairs

Each chapter includes several Housing Repair projects; however, each project contains many housing units. The Chapter-Specific Projects budget for a total of 905 housing units to be repaired.

Table 5-40. Inputs for the Chapter-Specific Housing Repair Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Repair of residential structure	\$2,747,945
2022	Repair of residential structure	\$19,189,341
2023	Repair of residential structure	\$27,618,113
2024	Repair of residential structure	\$35,537,961
2025	Repair of residential structure	\$31,651,966
2026	Repair of residential structure	\$28,499,636
2027	Repair of residential structure	\$13,156,679
Total	Repair of residential structure	\$158,401,643

Table 5-41. Total Economic Impact of Chapter-Specific Housing Repair Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	110	\$36,492,057	\$97,771,670	\$24,137,915	\$158,401,643
Indirect	49	\$15,087,913	\$21,265,116	\$12,305,859	\$48,658,887
Induced	27	\$8,382,687	\$10,833,012	\$7,192,481	\$26,408,180
Total	186	\$59,962,656	\$129,869,798	\$43,636,256	\$233,468,710

5.3.6 Health

There are 12 individual Chapter-Specific Projects categorized as Health. This category includes the Tuba City Hospital, of which only 22 percent of the expense is modeled in this analysis for being inside the FBFA. Here is the note from the Recovery Plan project list: "I.H.S - 2004 "Navajo Area Health Services Master Plan" for 2015 for service population of 29,000 (6,500 or 22 percent inside FBFA)".

Table 5-42. Inputs for the Chapter-Specific Health Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Construct new health care structures	\$3,211,380
2022	Construct new health care structures	\$22,425,572
2023	Construct new health care structures	\$32,275,834
2024	Construct new health care structures	\$41,531,343
2025	Construct new health care structures	\$36,989,986
2026	Construct new health care structures	\$33,306,024
2027	Construct new health care structures	\$15,375,519
Total	Construct new health care structures	\$185,115,660

Table 5-43. Total Economic Impact of Chapter-Specific Health Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	182	\$65,910,689	\$83,073,449	\$36,131,522	\$185,115,660
Indirect	21	\$7,121,413	\$12,881,733	\$4,615,615	\$24,618,761
Induced	38	\$11,816,155	\$15,270,109	\$10,138,509	\$37,224,773
Total	241	\$84,848,257	\$111,225,290	\$50,885,646	\$246,959,194

5.3.7 Infrastructure

Six of the chapters have budgeted for infrastructure projects. The regional infrastructure projects include the Western Navajo pipeline and C-aquifer Leupp to Dilcon pipeline. For infrastructure projects, the FBFA percentage field is blank on the itemized product list, so all infrastructure budgets are modeled inside the FBFA.

Table 5-44. Inputs for the Chapter-Specific Infrastructure Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Construction of nonresidential structures	\$10,978,710
2022	Construction of nonresidential structures	\$76,666,068
2023	Construction of nonresidential structures	\$110,341,059
2024	Construction of nonresidential structures	\$141,982,771
2025	Construction of nonresidential structures	\$126,457,281
2026	Construction of nonresidential structures	\$113,862,959
2027	Construction of nonresidential structures	\$52,564,125
Total	Construction of nonresidential structures	\$632,852,972

Table 5-45. Total Economic Impact of Chapter-Specific Infrastructure Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1,079	\$375,137,298	\$365,987,240	(\$108,271,565)	\$632,852,972
Indirect	111	\$37,773,104	\$62,584,919	\$26,330,590	\$126,688,613
Induced	213	\$66,796,206	\$86,321,242	\$57,312,916	\$210,430,363
Total	1,403	\$479,706,608	\$514,893,400	(\$24,628,059)	\$969,971,949

Notice that the direct impact on taxes/profits is showing a loss of \$108 million. As described in Section 4.1.1, taxes/profits are the sum of Taxes on Production and Imports (TOPI) and Other Property Income (OPI) for each economic sector. Since taxes are positive, we know that OPI for this sector must be negative or running a deficit. In other words, the industry as a whole for the county posted a deficit in 2018, the most recent data year available.

In this case, infrastructure projects are modeled using Sector 56 data (Construction of other new nonresidential structures). This is because the underlying IMPLAN data shows Sector 56 in Coconino County ran a deficit (negative OPI) in 2018, the most recent data year available. Sector 56 (Construction of other new nonresidential structures) employed 554 people in 2018, producing a total output of \$44 million, and yet OPI was \$(7,992,808.91).

Implementing the 2020 Regional Recovery Plan will increase the industry's size, with the annual average output double the current size of the industry. If absorbed, the industry most likely would not run a deficit. It is also most likely that employees will need to be brought in from outside Coconino County. Modeling the economic impacts of these likelihoods is beyond the scope of this analysis.

5.3.8 Public Safety

There are 20 individual Chapter-Specific Projects categorized as Public Safety, primarily police stations and fire stations.

Table 5-46. Inputs for the Chapter-Specific Public Safety Projects

Year	Industry Sector Description	Cap Ex Budget
2020	Construct. of new commercial structures	\$1,151,659
2021	Construction of nonresidential structures	\$8,042,216
2022	Construction of nonresidential structures	\$11,574,698
2023	Construction of nonresidential structures	\$14,893,890
2024	Construction of nonresidential structures	\$13,265,277
2025	Construction of nonresidential structures	\$11,944,142
2026	Construction of nonresidential structures	\$5,513,939
Total	Construction of nonresidential structures	\$66,385,820

Table 5-47. Total Economic Impact of Chapter-Specific Public Safety Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	80	\$26,720,567	\$33,529,096	\$6,136,158	\$66,385,820
Indirect	8	\$2,661,303	\$4,954,339	\$1,740,639	\$9,356,281
Induced	15	\$4,758,596	\$6,149,592	\$4,082,362	\$14,990,551
Total	103	\$34,140,465	\$44,633,027	\$11,959,160	\$90,732,652

5.3.9 Transportation

The 2008 Recovery Plan presents capital budgets for \$87 million of transportation projects, which adjusts to \$113 million in 2021 dollars. While some of these projects may have been completed since 2008 due to the federal funding mechanisms described in the 2020 Recovery Plan, the need for road maintenance is ongoing. Therefore, this analysis considers \$113 million a reasonable budget needed for current regional road maintenance. For transportation projects, the FBFA percentage field is blank on the itemized product list, so all infrastructure budgets are modeled as inside the FBFA.

Table 5-48. Inputs for the Chapter-Specific Transportation Projects

Year	Industry Sector Description	Cap Ex Budget
2021	Maintenance of highways and streets	\$1,952,671
2022	Maintenance of highways and streets	\$13,635,814
2023	Maintenance of highways and streets	\$19,625,242
2024	Maintenance of highways and streets	\$25,253,031
2025	Maintenance of highways and streets	\$22,491,671
2026	Maintenance of highways and streets	\$20,251,646
2027	Maintenance of highways and streets	\$9,349,047
Total	Maintenance of highways and streets	\$112,559,122

Table 5-49. Total Economic Impact of Chapter-Specific Transportation Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	164	\$56,401,204	\$67,224,673	(\$11,066,755)	\$112,559,122
Indirect	34	\$10,483,661	\$14,591,032	\$8,043,524	\$33,118,217
Induced	34	\$10,845,666	\$14,015,979	\$9,304,688	\$34,166,333
Total	232	\$77,730,531	\$95,831,684	\$6,281,457	\$179,843,672

5.3.10 Total of Chapter-Specific and Regional Projects Combined

The total capital budget for all Chapter-Specific Projects is \$3 billion in 2021 dollars. This investment will support an average of 3,905 direct jobs per year for 7 years, assuming all of the projects are completed within that time frame. Additionally, this investment will generate \$577 million of indirect activity and \$778 million of induced activity.

Table 5-50. Total Economic Impact of All Chapter-Specific Projects

Type	Avg annual Jobs for 7 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	3,905	\$1,348,273,121	\$1,371,681,891	\$269,357,285	\$2,989,312,297
Indirect	553	\$176,745,245	\$269,686,884	\$130,508,192	\$576,940,320
Induced	789	\$246,998,940	\$319,199,083	\$211,917,865	\$778,115,888
Total	5,247	\$1,772,017,305	\$1,960,567,858	\$611,783,342	\$4,344,368,505

Table 5-51 breaks down, by tax category, the \$293 million in tax revenues that result from the direct Chapter-Specific Project investments. An additional \$97 million in tax revenue is generated from indirect economic activity, and \$103 million results from induced spending. In total, the \$3 billion of direct Chapter-Specific Project investment will generate \$493 million in tax revenue.

Table 5-51. Tax Revenue Impacts of All Chapter-Specific Projects by Tax Category

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$5,279,858	\$8,038,591	\$4,060,505	\$34,574,989	\$240,654,956	\$292,608,898
Indirect	\$9,421,478	\$13,935,304	\$7,196,376	\$29,035,478	\$37,255,413	\$96,844,048
Induced	\$7,869,286	\$11,657,754	\$6,012,975	\$25,960,909	\$51,698,855	\$103,199,779
Total	\$22,570,622	\$33,631,650	\$17,269,855	\$89,571,375	\$329,609,224	\$492,652,726

As described in Section 5.3.7, the infrastructure construction industry (Sector 56) ran a deficit for Other Property Income (OPI) in 2018, the most recent data year available. As a result, the combined direct impact of taxes/profits (\$269 million) is less than the direct, tax-only impact of \$293 million.

Table 5-52 below shows the top 15 industry sectors most impacted by all Chapter-Specific Project investment. The type of impact is shown as well. Building supply, real estate, medical, and food service are among the top sectors due to indirect and induced spending.

Table 5-52. Total Economic Impact by Industry of All Chapter-Specific Projects for the Top 15 Industries

Economic Sector\Total Output	Direct	Indirect	Induced	Total
57 - Construction of new single-family residential structures	\$811,960,768	\$0	\$0	\$811,960,768
58 - Construction of new multifamily residential structures	\$664,886,133	\$0	\$0	\$664,886,133

Economic Sector\Total Output	Direct	Indirect	Induced	Total
56 - Construction of other new nonresidential structures	\$632,852,975	\$0	\$0	\$632,852,975
53 - Construction of new educational and vocational structures	\$230,649,962	\$0	\$0	\$230,649,962
55 - Construction of new commercial structures, including farm	\$192,886,032	\$0	\$0	\$192,886,032
50 - Construction of new health care structures	\$185,115,660	\$0	\$0	\$185,115,660
405 - Retail - building material, garden equip, supplies stores	\$0	\$172,355,759	\$4,708,371	\$177,064,130
61 - Maintenance and repair Construction of residential	\$158,401,644	\$68,994	\$5,546,341	\$164,016,979
449 - Owner-occupied dwellings	\$0	\$0	\$131,605,057	\$131,605,057
62 - Maintenance and repair Construction of highways, streets	\$112,559,122	\$4	\$3,611	\$112,562,736
447 - Other real estate	\$0	\$51,818,976	\$34,866,327	\$86,685,304
490 - Hospitals	\$0	\$0	\$85,081,292	\$85,081,292
483 - Offices of physicians	\$0	\$0	\$38,887,415	\$38,887,415
396 - Other durable goods merchant wholesalers	\$0	\$32,828,209	\$2,622,046	\$35,450,255
510 - Limited-service restaurants	\$0	\$835,862	\$32,501,047	\$33,336,908

6. Infrastructure Capital Improvement Projects

Within the Navajo Nation, every Chapter must maintain Infrastructure Capital Improvement Plan listings. The 2020 Recovery Plan lists Infrastructure Capital Improvement Plan summaries for each Chapter. Additional details are provided in each 2020 Chapter Recovery Plans.

6.1 Organization of Infrastructure Capital Improvement Plan Capital Expenditure Budgets

Budget items include land, planning/predesign, architecture/engineering, construction, and others. For economic impact modeling, only planning/predesign, architecture/engineering, and construction are counted as capital expenditures for IMPLAN inputs. All of the dollar amounts shown in the Chapter Recovery Plans are assumed to be 2020 dollars and are modeled and presented as 2021 dollars in this analysis. The total budget for Infrastructure Capital Improvement Plans is \$374 million, of which \$338 million is modeled in IMPLAN as capital expenditure. Table 6-1 below shows ICIP budgets by expense item category.

Table 6-1. Total Infrastructure Capital Improvement Plan Budget

Infrastructure Capital Improvement Plan Expense Category	Budget
Land	\$25,468,500
Planning	\$8,173,682
A/E	\$12,984,780
Construction	\$316,862,810
Other not with construction	\$2,666,499
Other with construction	\$8,288,994
Total	\$374,445,266

6.2 ICIP Land Acquisition

IMPLAN models the value of production, and land is not considered to be produced. In other words, the land acquisition does not support jobs and generate economic activity in the same manner that constructing a building does. Thus, the total Infrastructure Capital Improvement Plan land acquisition budget of \$25 million does not contribute to the IMPLAN impact results.

6.3 Other ICIP Expense Items

There are two types of “other” Infrastructure Capital Improvement Plan expenses, those associated with construction projects and those not associated with construction. The former is assumed to be largely FFE and similar expenses. For example, \$2.4 million is budgeted for a new multi-purpose building in Bodaway Gap Chapter, which includes \$20,000 of “other” expense. We assume this \$20,000 to be FFE, and it is not counted as capital expenditure for IMPLAN modeling. The total amount budgeted for this type of expense is \$8 million.

Several Infrastructure Capital Improvement Plan projects have budget expenses for planning and “other” and do not appear to be associated with actual development. These projects are predominately feasibility and design studies and some equipment purchases, and are not counted as capital expenditure for IMPLAN modeling.

Table 6-2. Total Infrastructure Capital Improvement Plan projects not associated with construction

Chapter	Event	Category	Budget
Cameron	E911 addressing system	Econ development	\$40,788
Coalmine	Home renovation and repairs	Housing	\$203,939
Coalmine	Light industrial site	Econ development	\$101,969
Coppermine	Environmental surveys, biological assessments	Roads/streets	\$571,028
Coppermine	Develop Community and Economic Development plan	Econ development	\$203,939
Coppermine	Purchase and equip backhoe	Econ development	\$50,985
Kaibeto	Infrastructure design	Water system	\$377,287
Kaibeto	Plan/Design/Cons Power and waterline connect	Water system	\$254,923
Tolani Lake	Purchase motor grader	Econ development	\$132,560
Tolani Lake	Withdrawal of gravel pit tract	Econ development	\$729,081
Total			\$2,666,499

6.4 ICIP Project Impacts by Chapter

There are nine Subsections within Section 6.2, one for each of the nine FBFA chapters. For each subsection, there is a categorized list of projects by name and a total budget for each project category. The share of the budget within the FBFA for each of these projects was not available. The first table in each Subsection shows the IMPLAN model inputs, and the second table presents economic impact outputs for each Chapter’s Infrastructure Capital Improvement Plan projects collectively.

6.4.1 Bodaway Gap

Table 6-3. Inputs for the Bodaway Gap ICIPs

Event	Category	Sector	Cap Ex Budget
Power Line Ext E/W Chapter	Single phase	52	\$713,786
Water Line Ext E/W Chapter	Water system	56	\$713,786
Bathroom Addition Project	Econ development	59	\$856,543
Echo Cliffs Veterans Facility	Econ development	55	\$2,549,234
Chapter House/Senior Center	Senior Citizens	55	\$2,472,757
Multi-purpose building	Multi-purpose building	55	\$2,457,462
Construct Junction 89/160 Truck Stop	Econ development	55	\$8,973,305

Event	Category	Sector	Cap Ex Budget
Total			\$18,736,872

Table 6-4. Economic Impact of Bodaway Gap Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	157	\$7,470,196	\$9,555,303	\$1,711,374	\$18,736,872
Indirect	17	\$813,903	\$1,468,847	\$544,143	\$2,826,892
Induced	30	\$1,341,752	\$1,733,963	\$1,151,093	\$4,226,808
Total	203	\$9,625,851	\$12,758,113	\$3,406,609	\$25,790,573

6.4.2 Cameron

Table 6-5. Inputs for the Cameron Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Upgrade Head Start with cooling, heating, roof	Head Start	60	\$42,827
Upgrade Chapter sewer line	Water system	60	\$138,678
North Cameron powerline extension	Single phase	52	\$892,232
E911 addressing system	Econ development	NA	\$0
New Demo Farm	Econ development	55	\$458,862
New Cameron Cultural Center	Econ development	55	\$645,806
Upgrade solid waste transfer station	Solid waste	60	\$2,549,234
New chapter house	Chapter House	55	\$2,671,598
South powerline extension project	Single phase	52	\$892,232
Total			\$8,291,469

Table 6-6. Economic Impact of Cameron Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	57	\$2,723,440	\$4,433,124	\$1,134,905	\$8,291,469
Indirect	10	\$456,488	\$754,188	\$329,005	\$1,539,681
Induced	12	\$515,557	\$666,261	\$442,294	\$1,624,112
Total	78	\$3,695,485	\$5,853,573	\$1,906,203	\$11,455,261

6.4.3 Coalmine Canyon

Table 6-7. Inputs for the Coalmine Canyon Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Coalmine scattered powerline	Single phase	52	\$92,619,800
Water/sewer phase II w/booster station	Water system	56	\$774,967
Land line phone	Chapter House	52	\$2,039,387
Chapter facility audit and repair	Chapter House	60	\$768,169
Kerley Valley electrical hookup	Single phase	52	\$141,901
Assisted living home	Senior Citizens	55	\$1,019,694
Pave N Route 6720	Roads/streets	54	\$30,590,811
Construct Coalmine Cemetery	Cemetery tract	55	\$101,969
Install scattered solar system	Econ development	61	\$305,908
Total			\$128,362,607

Table 6-8. Economic Impact of Coalmine Canyon Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	737	\$36,655,996	\$60,098,062	\$31,608,548	\$128,362,607
Indirect	125	\$6,274,821	\$10,536,217	\$4,395,874	\$21,206,912
Induced	156	\$6,954,881	\$8,987,866	\$5,966,904	\$21,909,651
Total	1,018	\$49,885,699	\$79,622,146	\$41,971,325	\$171,479,170

6.4.4 Coppermine

Table 6-9. Inputs for the Coppermine Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Coppermine scattered powerline project	Single phase	52	\$1,093,042
KOKO waterline Project extension	Water system	56	\$19,437,911
Scattered housing development FBFA	Housing	57	\$4,588,622
Multi-purpose building	Multi-purpose building	55	\$2,625,711
Agriculture water development	Water system	49	\$20,394
Chapter parking lot	Parking lot	55	\$219,234
Coppermine Chapter Telecommunication	Econ development	52	\$509,847
Total			\$28,494,762

Table 6-10. Economic Impact of Coppermine Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	301	\$14,846,503	\$15,627,228	(\$1,979,119)	\$28,494,612
Indirect	36	\$1,702,322	\$2,753,297	\$1,207,305	\$5,662,925
Induced	60	\$2,678,581	\$3,461,553	\$2,298,212	\$8,438,346
Total	396	\$19,227,407	\$21,842,079	\$1,526,398	\$42,595,883

6.4.5 Kaibeto

Table 6-11. Inputs for the Kaibeto Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Solid Waste Transfer Station	Solid waste	56	\$837,169
Multipurpose building	Multi-purpose building	55	\$9,789,060
Plan/Design/Construct one-stop tribal complex	Multi-purpose building	55	\$3,181,444
Plan/Design/Construct Kaibeto safety complex	Public safety	55	\$3,207,956
Plan/Design/Construct Community road and street	Roads/streets	54	\$5,302,407
Plan/Design/Construct Veterans Cemetery	Cemetery tract	55	\$81,575
Total			\$22,399,612

Table 6-12. Economic Impact of Kaibeto Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	174	\$8,456,642	\$11,313,318	\$2,629,652	\$22,399,612
Indirect	19	\$925,891	\$1,736,428	\$627,772	\$3,290,090
Induced	34	\$1,518,700	\$1,962,631	\$1,302,987	\$4,784,317
Total	226	\$10,901,233	\$15,012,376	\$4,560,411	\$30,474,020

6.4.6 Leupp

Table 6-13. Inputs for the Leupp Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
N Grandfalls powerline extension	Single phase	52	\$3,210,800
N Leupp powerline extension	Single phase	52	\$412,976
E Canyon Diablo powerline extension	Single phase	52	\$963,611

Event	Category	Sector	Cap Ex Budget
S Leupp powerline extension	Single phase	52	\$1,269,519
S Grandfalls powerline extension	Single phase	52	\$688,293
Round Cedar - GF waterline extension	Water system	56	\$892,232
W Canyon Diablo powerline extension	Single phase	52	\$2,039,387
Total			\$9,476,818

Table 6-14. Economic Impact of Leupp Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	62	\$3,002,226	\$4,438,448	\$2,036,145	\$9,476,818
Indirect	10	\$488,027	\$785,801	\$336,138	\$1,609,966
Induced	13	\$565,728	\$731,098	\$485,329	\$1,782,155
Total	84	\$4,055,981	\$5,955,347	\$2,857,611	\$12,868,939

6.4.7 Tolani Lake

Table 6-15. Inputs for the Tolani Lake Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Parking lot for Senior Center and Preschool	Parking lot	55	\$113,186
Water Line 10 miles N of TL chapter	Water system	56	\$522,083
NW Powerline extension	Single phase	52	\$535,339
Construct community recreation park	Recreation	55	\$464,980
Parking lot for TL Chapter House	Parking lot	55	\$198,840
Total			\$1,834,429

Table 6-16. Economic Impact of Tolani Lake Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	16	\$776,463	\$938,972	\$118,994	\$1,834,429
Indirect	2	\$89,423	\$153,119	\$60,742	\$303,284
Induced	3	\$140,208	\$181,192	\$120,289	\$441,689
Total	21	\$1,006,094	\$1,273,283	\$300,025	\$2,579,402

6.4.8 Tonalea

Table 6-17. Inputs for the Tonalea Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
New Chapter House	Chapter House	55	\$2,651,554
Wildcat Powerline extension Phase II	Single phase	52	\$1,598,119
Sour Wash Powerline extension	Single phase	52	\$718,884
White Mesa Powerline extension Phase II	Single phase	52	\$688,293
Total			\$5,656,851

Table 6-18. Economic Impact of Tonalea Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	40	\$1,933,128	\$2,712,381	\$1,011,341	\$5,656,851
Indirect	5	\$258,502	\$442,088	\$174,203	\$874,793
Induced	8	\$355,148	\$458,963	\$304,673	\$1,118,783
Total	54	\$2,546,778	\$3,613,432	\$1,490,217	\$7,650,428

6.4.9 Tuba City

Table 6-19. Inputs for the Tuba City Infrastructure Capital Improvement Plan Projects

Event	Category	Sector	Cap Ex Budget
Head Start Renovation	Head Start	60	\$1,551,974
Community and Veterans Cemeteries	Cemetery tract	55	\$1,543,816
New Youth Center	Multi-purpose building	55	\$6,913,523
Community and Convention Center	Multi-purpose building	55	\$11,471,554
New Equestrian Center	Recreation	55	\$25,186,435
New Chapter House	Chapter House	55	\$1,070,678
New Fire Department	Public safety	55	\$11,726,478
New Sports Complex	Recreation	55	\$40,073,963
New Senior Building	Senior Citizens	55	\$4,456,062
Kerley Valley Road Improvement	Roads/streets	62	\$2,855,142
Moenave Road Improvement	Roads/streets	62	\$5,516,543
Old Airport Loop Road	Roads/streets	62	\$954,535

Event	Category	Sector	Cap Ex Budget
Chee Willie Road Improvements	Roads/streets	62	\$1,447,149
Total			\$114,767,853

Table 6-20. Economic Impact of Tuba City Infrastructure Capital Improvement Plan Projects

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	987	\$47,023,642	\$59,146,453	\$8,597,758	\$114,767,853
Indirect	108	\$5,232,218	\$9,227,836	\$3,551,304	\$18,011,358
Induced	189	\$8,464,703	\$10,939,039	\$7,261,832	\$26,665,574
Total	1,284	\$60,720,563	\$79,313,329	\$19,410,894	\$159,444,785

6.5 Infrastructure Capital Improvement Plan Project Impacts by Category

There are 14 Subsections within Section 6.5 , one for each ICIP project category. For each category, there is a list of projects and a total capital budget. The share of the budget within the FBFA for each project is not available. The first table in each Subsection shows the IMPLAN model inputs, and the second table presents economic impact outputs for each collection of projects within the category.

6.5.1 Cemetery Projects

Table 6-21. Inputs for the Infrastructure Capital Improvement Plan Cemetery Projects

Chapter	Project Description	Sector	Cap Ex Budget
Coalmine	Construct Coalmine Cemetery	55	\$101,969
Kaibeto	Plan/Design/Construct Veterans Cemetery	55	\$81,575
Tuba City	Community and Veterans Cemeteries	55	\$1,543,816
Total			\$1,727,361

Table 6-22. Total Economic Impact of the Infrastructure Capital Improvement Plan Cemetery Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	15	\$695,270	\$872,428	\$159,663	\$1,727,361
Indirect	1	\$69,247	\$128,912	\$45,291	\$243,451
Induced	3	\$123,819	\$160,013	\$106,223	\$390,055
Total	19	\$888,336	\$1,161,353	\$311,178	\$2,360,866

6.5.2 Chapter House

Table 6-23. Inputs for the Infrastructure Capital Improvement Plan Chapter House Projects

Chapter	Project Description	Sector	Cap Ex Budget
Cameron	New Chapter House	55	\$2,671,598
Coalmine	Land line phone	52	\$2,039,387
Coalmine	Chapter facility audit and repair	60	\$768,169
Tonalea	New Chapter House	55	\$2,651,554
Tuba City	New Chapter House	55	\$1,070,678
Total			\$9,201,387

Table 6-24. Total Economic Impact of the Infrastructure Capital Improvement Plan Chapter House Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	70	\$3,355,035	\$4,642,303	\$1,204,048	\$9,201,387
Indirect	9	\$420,052	\$734,850	\$285,914	\$1,440,817
Induced	14	\$611,650	\$790,442	\$524,726	\$1,926,818
Total	93	\$4,386,737	\$6,167,596	\$2,014,689	\$12,569,022

6.5.3 Economic Development

Table 6-25. Inputs for the Infrastructure Capital Improvement Plan Economic Development Projects

Chapter	Project Description	Sector	Cap Ex Budget
Coalmine	Install scattered solar system	61	\$305,908
Cameron	New Demo Farm	55	\$458,862
Coppermine	Coppermine Chapter Telecommunication	52	\$509,847
Bodaway Gap	Bathroom Addition Project	59	\$856,543
Bodaway Gap	Construct Junction 89/160 Truck Stop	55	\$8,973,305
Total			\$11,104,465

Table 6-26. Total Economic Impact of the Infrastructure Capital Improvement Plan Economic Development Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	89	\$4,232,983	\$5,692,298	\$1,179,184	\$11,104,465

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Indirect	10	\$508,805	\$898,914	\$347,103	\$1,754,822
Induced	17	\$768,158	\$992,700	\$659,003	\$2,419,861
Total	116	\$5,509,946	\$7,583,911	\$2,185,290	\$15,279,148

6.5.4 Head Start

Table 6-27. Inputs for the Infrastructure Capital Improvement Plan Head Start Projects

Chapter	Project Description	Sector	Cap Ex Budget
Cameron	Upgrade Head Start with cooling, heating, roof	60	\$42,827
Tuba City	Head Start Renovation	60	\$1,551,974
Total			\$1,594,801

Table 6-28. Total Economic Impact of the Infrastructure Capital Improvement Plan Head Start Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	8	\$402,593	\$998,970	\$193,238	\$1,594,801
Indirect	3	\$125,551	\$191,240	\$98,077	\$414,867
Induced	2	\$85,763	\$110,832	\$73,578	\$270,173
Total	13	\$613,906	\$1,301,042	\$364,893	\$2,279,841

6.5.5 Housing

Table 6-29. Inputs for the Infrastructure Capital Improvement Plan Housing Projects

Chapter	Project Description	Sector	Cap Ex Budget
Coppermine	Scattered housing development FBFA	57	\$4,588,622

Table 6-30. Total Economic Impact of the Infrastructure Capital Improvement Plan Housing Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	35	\$1,712,732	\$2,206,695	\$669,195	\$4,588,622
Indirect	8	\$345,789	\$486,016	\$267,430	\$1,099,234
Induced	7	\$333,949	\$431,566	\$286,497	\$1,052,012
Total	50	\$2,392,469	\$3,124,277	\$1,223,122	\$6,739,868

6.5.6 Multi-purpose Buildings

Table 6-31. Inputs for the Infrastructure Capital Improvement Plan Multi-Purpose Building Projects

Chapter	Project Description	Sector	Cap Ex Budget
Cameron	New Cameron Cultural Center	55	\$645,806
Bodaway Gap	Echo Cliffs Veterans Facility	55	\$2,549,234
Bodaway Gap	Multi-purpose building	55	\$2,457,462
Coppermine	Multi-purpose building	55	\$2,625,711
Kaibeto	Multipurpose building	55	\$9,789,060
Kaibeto	Plan/Design/Cons one-stop tribal complex	55	\$3,181,444
Tuba City	New Youth Center	55	\$6,913,523
Tuba City	Community and Convention Center	55	\$11,471,554
Total			\$39,633,795

Table 6-32. Total Economic Impact of the Infrastructure Capital Improvement Plan Multi-Purpose Building Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	336	\$15,952,766	\$20,017,608	\$3,663,421	\$39,633,795
Indirect	32	\$1,588,856	\$2,957,850	\$1,039,200	\$5,585,906
Induced	64	\$2,840,987	\$3,671,442	\$2,437,260	\$8,949,688
Total	432	\$20,382,609	\$26,646,899	\$7,139,881	\$54,169,389

6.5.7 Parking Lots

Table 6-33. Inputs for the Infrastructure Capital Improvement Plan Parking Lot Projects

Chapter	Project Description	Sector	Cap Ex Budget
Coppermine	Chapter parking lot	55	\$219,234
Tolani Lake	Parking lot for Senior Center and Preschool	55	\$113,186
Tolani Lake	Parking lot for TL Chapter House	55	\$198,840
Total			\$531,260

Table 6-34. Total Economic Impact of the Infrastructure Capital Improvement Plan Parking Lot Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	5	\$213,835	\$268,321	\$49,105	\$531,260
Indirect	0	\$21,297	\$39,648	\$13,930	\$74,875
Induced	1	\$38,081	\$49,213	\$32,670	\$119,964
Total	6	\$273,213	\$357,181	\$95,705	\$726,099

6.5.8 Public Safety

Table 6-35. Inputs for the Infrastructure Capital Improvement Plan Public Safety Projects

Chapter	Project Description	Sector	Cap Ex Budget
Kaibeto	Plan/Design/Cons Kaibeto safety complex	55	\$3,207,956
Tuba City	New Fire Department	55	\$11,726,478
Total			\$14,934,434

Table 6-36. Total Economic Impact of the Infrastructure Capital Improvement Plan Public Safety Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	127	\$6,011,171	\$7,542,847	\$1,380,416	\$14,934,434
Indirect	12	\$598,698	\$1,114,549	\$391,582	\$2,104,829
Induced	24	\$1,070,514	\$1,383,438	\$918,385	\$3,372,337
Total	163	\$7,680,383	\$10,040,834	\$2,690,383	\$20,411,600

6.5.9 Recreation

Table 6-37. Inputs for the Infrastructure Capital Improvement Plan Recreation Projects

Chapter	Project Description	Sector	Cap Ex Budget
Tolani Lake	Construct community recreation park	55	\$464,980
Tuba City	New Equestrian Center	55	\$25,186,435
Tuba City	New Sports Complex	55	\$40,073,963
Total			\$65,725,378

Table 6-38. Total Economic Impact of the Infrastructure Capital Improvement Plan Recreation Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	557	\$26,454,736	\$33,195,530	\$6,075,112	\$65,725,378
Indirect	53	\$2,634,827	\$4,905,051	\$1,723,322	\$9,263,200
Induced	105	\$4,711,255	\$6,088,412	\$4,041,749	\$14,841,416
Total	715	\$33,800,818	\$44,188,993	\$11,840,183	\$89,829,994

6.5.10 Roads/Streets

Table 6-39. Inputs for the Infrastructure Capital Improvement Plan Roads/streets Projects

Chapter	Project Description	Sector	Cap Ex Budget
Coalmine	Pave N Route 6720	54	\$30,590,811
Kaibeto	Plan/Design/Cons Community road and street	54	\$5,302,407
Tuba City	Kerley Valley Road Improvement	62	\$2,855,142
Tuba City	Moenave Road Improvement	62	\$5,516,543
Tuba City	Old Airport Loop Road	62	\$954,535
Tuba City	Chee Willie Road Improvements	62	\$1,447,149
Total			\$46,666,589

Table 6-40. Total Economic Impact of the Infrastructure Capital Improvement Plan Roads/streets Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	284	\$14,981,263	\$24,148,076	\$7,537,250	\$46,666,589
Indirect	53	\$2,520,300	\$4,368,235	\$1,897,282	\$8,785,817
Induced	63	\$2,830,594	\$3,657,978	\$2,429,017	\$8,917,589
Total	400	\$20,332,156	\$32,174,289	\$11,863,550	\$64,369,994

6.5.11 Senior Citizens

Table 6-41. Inputs for the Infrastructure Capital Improvement Plan Senior Citizens Projects

Chapter	Project Description	Sector	Cap Ex Budget
Bodaway Gap	Chapter House/Senior Center	55	\$2,472,757
Coalmine	Assisted living home	55	\$1,019,694
Tuba City	New Senior Building	55	\$4,456,062

Chapter	Project Description	Sector	Cap Ex Budget
Total			\$7,948,512

Table 6-42. Total Economic Impact of the Infrastructure Capital Improvement Plan Senior Citizens Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	67	\$3,199,309	\$4,014,508	\$734,695	\$7,948,512
Indirect	6	\$318,643	\$593,193	\$208,410	\$1,120,247
Induced	13	\$569,757	\$736,303	\$488,790	\$1,794,850
Total	86	\$4,087,709	\$5,344,005	\$1,431,895	\$10,863,609

6.5.12 Single Phase

Table 6-43. Inputs for the Infrastructure Capital Improvement Plan Single Phase Projects

Chapter	Project Description	Sector	Cap Ex Budget
Bodaway Gap	Powerline extension E/W Chapter	52	\$713,786
Cameron	North Cameron powerline extension	52	\$892,232
Cameron	South powerline extension project	52	\$892,232
Coalmine	Coalmine scattered powerline	52	\$92,619,800
Coalmine	Kerley Valley electrical hookup	52	\$141,901
Coppermine	Coppermine scattered powerline project	52	\$1,093,042
Leupp	N Grandfalls powerline extension	52	\$3,210,800
Leupp	N Leupp powerline extension	52	\$412,976
Leupp	E Canyon Diablo powerline extension	52	\$963,611
Leupp	S Leupp powerline extension	52	\$1,269,519
Leupp	S Grandfalls powerline extension	52	\$688,293
Leupp	W Canyon Diablo powerline extension	52	\$2,039,387
Tolani Lake	NW Powerline extension	52	\$535,339
Tonalea	Wildcat Powerline extension Phase II	52	\$1,598,119
Tonalea	Sour Wash Powerline extension	52	\$718,884
Tonalea	White Mesa Powerline extension Phase II	52	\$688,293
Total			\$108,478,214

Table 6-44. Total Economic Impact of the Infrastructure Capital Improvement Plan ICIP Single Phase Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	646	\$31,254,044	\$49,565,729	\$27,658,441	\$108,478,214
Indirect	110	\$5,492,550	\$8,806,786	\$3,778,055	\$18,077,391
Induced	133	\$5,958,759	\$7,700,588	\$5,111,747	\$18,771,095
Total	889	\$42,705,353	\$66,073,103	\$36,548,243	\$145,326,699

6.5.13 Solid Waste

Table 6-45. Inputs for the Infrastructure Capital Improvement Plan Solid Waste Projects

Chapter	Project Description	Sector	Cap Ex Budget
Cameron	Upgrade solid waste transfer station	60	\$2,549,234
Kaibeto	Solid waste transfer station	56	\$837,169
Total			\$3,386,403

Table 6-46. Total Economic Impact of the Infrastructure Capital Improvement Plan Solid Waste Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	23	\$1,139,780	\$2,080,965	\$165,658	\$3,386,403
Indirect	5	\$250,676	\$388,474	\$191,615	\$830,765
Induced	5	\$225,450	\$291,351	\$193,428	\$710,230
Total	33	\$1,615,906	\$2,760,790	\$550,702	\$4,927,398

6.5.14 Water System

Table 6-47. Inputs for the Infrastructure Capital Improvement Plan Water System Projects

Chapter	Project Description	Sector	Cap Ex Budget
Bodaway Gap	Water line extension E/W Chapter	56	\$713,786
Cameron	Upgrade Chapter sewer line	60	\$138,678
Coalmine	Water/sewer phase II with booster station	56	\$774,967
Coppermine	KOKO waterline Project extension	56	\$19,437,911
Coppermine	Agriculture water development	49	\$20,394
Leupp	Round Cedar - GF waterline extension	56	\$892,232

Chapter	Project Description	Sector	Cap Ex Budget
Tolani Lake	Water Line 10 miles N of chapter	56	\$522,083
Total			\$22,500,052

Table 6-48. Total Economic Impact of the Infrastructure Capital Improvement Plan System Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	268	\$13,282,754	\$13,017,087	(\$3,799,789)	\$22,500,052
Indirect	28	\$1,346,576	\$2,228,799	\$939,378	\$4,514,753
Induced	53	\$2,366,527	\$3,058,276	\$2,030,545	\$7,455,348
Total	349	\$16,995,857	\$18,304,162	(\$829,866)	\$34,470,153

6.6 Phasing

The 2020 Recovery Plan lists a year for which each project is planned, beginning with 2020 and continuing through 2025. In this section, the Infrastructure Capital Improvement Plan's economic impacts are estimated by grouping the projects in each year based on the economic sector. This analysis is stepped ahead one year. Rather than beginning in 2020 and continuing through 2025, this analysis assumes that projects begin in 2021 and continue through 2026. All of the model inputs and economic impacts are presented in 2021 dollars, regardless of the year the projects occur. Inflation will determine the actual expense and impacts of future year projects.

The first table in each Subsection shows the IMPLAN model inputs, and the second table presents economic impact outputs for each year 2021 through 2026.

6.6.1 First Year – 2021

Table 6-49. Inputs for the Infrastructure Capital Improvement Plan 2021 Projects

Category	Sector	Cap Ex Budget
Single phase	52	\$101,751,364
Various economic development	55	\$3,869,408
Water system	56	\$2,848,005
Economic development	59	\$856,543
Various repairs	60	\$949,674
Total		\$110,274,994

Table 6-50. Total Economic Impact of the ICIP 2021 Projects

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	682	\$33,020,482	\$51,194,983	\$26,059,529	\$110,274,994
Indirect	113	\$5,628,638	\$9,064,763	\$3,880,677	\$18,574,078
Induced	140	\$6,266,140	\$8,097,816	\$5,375,511	\$19,739,467
Total	935	\$44,915,261	\$68,357,562	\$35,315,717	\$148,588,540

6.6.2 Second Year – 2022

Table 6-51. Inputs for the Infrastructure Capital Improvement Plan 2022 Projects

Category	Sector	Cap Ex Budget
Agriculture water development	49	\$20,394
Single phase	52	\$2,224,902
Various economic development	55	\$108,281,276
Waterline extension	56	\$19,437,911
Scattered housing	57	\$4,588,622
Head Start	60	\$1,551,974
Total		\$136,105,079

Table 6-52. Total Economic Impact of the Infrastructure Capital Improvement Plan 2022 Projects

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1,206	\$57,856,053	\$70,135,688	\$8,113,188	\$136,104,930
Indirect	124	\$6,082,638	\$10,858,552	\$4,088,903	\$21,030,093
Induced	232	\$10,353,980	\$13,380,566	\$8,882,878	\$32,617,425
Total	1,562	\$74,292,671	\$94,374,807	\$21,084,970	\$189,752,447

6.6.3 Third Year – 2023

Table 6-53. Inputs for the Infrastructure Capital Improvement Plan 2023 Projects

Category	Sector	Cap Ex Budget
Single phase and economic development	52	\$2,161,751
Roads/streets	54	\$30,590,811
Various economic development	55	\$18,629,804

Category	Sector	Cap Ex Budget
Solid waste	60	\$2,549,234
Roads/streets	62	\$10,773,370
Total		\$64,704,971

Table 6-54. Total Economic Impact of the Infrastructure Capital Improvement Plan 2023 Projects

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	442	\$22,330,535	\$33,525,074	\$8,849,362	\$64,704,971
Indirect	70	\$3,352,990	\$5,807,529	\$2,451,485	\$11,612,004
Induced	93	\$4,157,024	\$5,372,153	\$3,566,851	\$13,096,029
Total	605	\$29,840,549	\$44,704,756	\$14,867,699	\$89,413,003

6.6.4 Fourth Year – 2024

Table 6-55. Inputs for the Infrastructure Capital Improvement Plan 2024 Projects

Category	Sector	Cap Ex Budget
Single phase	52	\$2,850,044
Various economic development	55	\$12,256,718
Economic development scattered solar	61	\$305,908
Total		\$15,412,671

Table 6-56. Total Economic Impact of the Infrastructure Capital Improvement Plan 2024 Projects

	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	122	\$5,824,990	\$7,681,486	\$1,906,195	\$15,412,671
Indirect	13	\$664,833	\$1,187,369	\$444,409	\$2,296,610
Induced	24	\$1,051,316	\$1,358,628	\$901,912	\$3,311,856
Total	159	\$7,541,139	\$10,227,483	\$3,252,515	\$21,021,137

6.6.5 Fifth Year – 2025

Table 6-57. Inputs for the Infrastructure Capital Improvement Plan 2025 Projects

Category	Sector	Cap Ex Budget
Public safety	55	\$3,207,956

Category	Sector	Cap Ex Budget
Water system	56	\$892,232
Total		\$4,100,188

Table 6-58. Total Economic Impact of the Infrastructure Capital Improvement Plan 2025 Projects

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	38	\$1,820,106	\$2,136,213	\$143,870	\$4,100,188
Indirect	4	\$181,857	\$327,644	\$121,235	\$630,736
Induced	7	\$324,122	\$418,867	\$278,075	\$1,021,064
Total	49	\$2,326,084	\$2,882,724	\$543,179	\$5,751,988

6.6.6 Sixth Year – 2026

Table 6-59. Inputs for the Infrastructure Capital Improvement Plan 2026 Projects

Category	Sector	Cap Ex Budget
Single phase	52	\$2,039,387
Roads/streets	54	\$5,302,407
Various economic development	55	\$81,575
Total		\$7,423,370

Table 6-60. Total Economic Impact of the Infrastructure Capital Improvement Plan 2026 Projects

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	39	\$2,036,070	\$3,589,847	\$1,797,453	\$7,423,370
Indirect	7	\$330,640	\$611,963	\$239,776	\$1,182,379
Induced	9	\$382,676	\$494,534	\$328,385	\$1,205,595
Total	55	\$2,749,387	\$4,696,344	\$2,365,614	\$9,811,345

6.7 Total of Infrastructure Capital Improvement Projects

The total capital budget for all Infrastructure Capital Improvement Plan projects is \$338 million in 2021 dollars. This investment will support an average of 561 direct jobs per year for six years assuming all of the projects are completed within that time frame. Additionally, this investment will generate \$55 million of indirect activity and \$71 million of induced activity. Note that 561 is the average annual number of jobs over six years, whereas the project year proposals show most of the capital expenditure and associated employment impacts occurring in the

initial years. Likewise, the distribution of the total output impact of \$464 million will be determined by actual annual spending occurring in each year.

Table 6-61. Total Economic Impact of All Nine Chapter Infrastructure Capital Improvement Plan Projects

Type	Avg annual Jobs for 6 yrs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	422	\$122,888,236	\$168,263,290	\$46,869,597	\$338,021,123
Indirect	55	\$16,241,595	\$27,857,820	\$11,226,485	\$55,325,901
Induced	84	\$22,535,259	\$29,122,565	\$19,333,612	\$70,991,436
Total	561	\$161,665,091	\$225,243,676	\$77,429,694	\$464,338,460

Table 6-62 breaks down, by tax category, the \$29.3 million in tax revenues that result from the direct Infrastructure Capital Improvement Plan investments. An additional \$7.8 million in tax revenue is generated from indirect economic activity, and \$9.4 million results from induced spending. In total, the \$338 million of Infrastructure Capital Improvement Plan investment will generate \$46.5 million in tax revenue.

Table 6-62. Tax Revenue Impacts of All Nine Chapter Infrastructure Capital Improvement Plan Projects

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$817,294	\$1,228,577	\$626,647	\$4,159,370	\$22,467,223	\$29,299,111
Indirect	\$703,258	\$1,040,753	\$537,235	\$2,216,689	\$3,324,193	\$7,822,126
Induced	\$717,906	\$1,063,524	\$548,557	\$2,368,411	\$4,716,777	\$9,415,174
Total	\$2,238,458	\$3,332,853	\$1,712,438	\$8,744,469	\$30,508,193	\$46,536,411

Table 6-63 shows the top 15 industry sectors most impacted by all Infrastructure Capital Improvement Plan investments. The type of impact is shown as well. Building supply, real estate, medical, and architectural are among the top sectors as a result of indirect and induced spending.

Table 6-63. Total Economic Impact by Industry of All Infrastructure Capital Improvement Plan Projects for the Top 15 Industries

Economic Sector\Total Output	Direct	Indirect	Induced	Total
55 - Construction of new commercial structures, including farm	\$146,326,738	\$0	\$0	\$146,326,738
52 - Construction of new power and communication structures	\$111,027,448	\$0	\$0	\$111,027,448
54 - Construction of new highways and streets	\$35,893,219	\$0	\$0	\$35,893,219
56 - Construction of other new nonresidential structures	\$23,178,148	\$0	\$0	\$23,178,148
449 - Owner-occupied dwellings	\$0	\$0	\$12,009,449	\$12,009,449
62 - Maintenance of highways, streets, bridges, tunnels	\$10,773,370	\$0	\$329	\$10,773,700

Economic Sector\Total Output	Direct	Indirect	Induced	Total
447 - Other real estate	\$0	\$5,631,453	\$3,181,064	\$8,812,517
490 - Hospitals	\$0	\$0	\$7,764,539	\$7,764,539
405 - Retail - building material, garden equipment, supplies stores	\$0	\$6,516,906	\$429,529	\$6,946,435
60 - Maintenance of nonresidential structures	\$5,050,883	\$304,692	\$213,394	\$5,568,969
396 - Wholesale - Other durable goods merchant wholesalers	\$0	\$4,442,448	\$239,159	\$4,681,608
57 - Construction of new single-family residential structures	\$4,588,622	\$0	\$0	\$4,588,622
457 - Architectural, engineering, and related services	\$0	\$3,918,693	\$90,767	\$4,009,460
483 - Offices of physicians	\$0	\$0	\$3,547,691	\$3,547,691
453 - Commercial machinery and equipment rental	\$0	\$3,115,316	\$72,617	\$3,187,933

7. Immediate Recovery Projects

Section 7 identifies Immediate Recovery Projects and estimates the economic impact of each project.

7.1 Organization of Immediate Recovery Capital Expenditure Budgets

The 2020 Recovery Plan references Immediate Recovery Projects at several points throughout the document. The total capital budget for these projects is found to be \$257 million in 2021 dollars. Indeed, the document describes a number of projects in addition to the Chapter-Specific Projects and Infrastructure Capital Improvement Plans described above. However, these additional projects appear to be in various stages of planning. After careful review, projects were selected for impact modeling based on the availability of a capital expenditure budget. All of the Immediate Recovery Projects described below are shown in 2021 dollars.

7.1.1 Echo Cliffs Health Center

The Echo Cliffs Health Center has been in the planning phase for the past 12 years. This facility will be developed on 75 acres that have already been withdrawn by the Coppermine Chapter. The 122,000 square foot health center will feature a helipad, 92-person staff housing with recreational facilities, and 308 parking spaces. Once constructed, the 2020 Recovery Plan estimates operations will support 250 full-time employment jobs. The capital cost of constructing the facility is estimated to be \$154 million.

Table 7-1. Inputs for the Echo Cliffs Health Center

Event Year	Project Description	Sector	Cap Ex Budget
2021	Construction of Echo Cliffs Health Center	50	\$154,177,690

Table 7-2. Total Economic Impact of the Echo Cliffs Health Center

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1,060	\$54,895,182	\$69,189,567	\$30,092,941	\$154,177,690
Indirect	121	\$5,931,227	\$10,728,837	\$3,844,218	\$20,504,282
Induced	220	\$9,841,347	\$12,718,049	\$8,444,082	\$31,003,479
Total	1,401	\$70,667,756	\$92,636,454	\$42,381,241	\$205,685,451

7.1.2 Little Colorado River Valley Farms Project

The Little Colorado River (LCR) Valley Farms Plan ranges from 100 to 4,000 acres of fertile, irrigable soils adjacent to the alluvial aquifer of the LCR. This analysis is based on the 4,000-acre size. This economic impact analysis considers both construction costs as well as the annual operating expenses. Contingency expenses are not modeled as they are undefined. The value of and revenues derived from crop production over time are not within the scope of this analysis.

7.1.3 Construction of the Little Colorado River Valley Farms Project

Initial project development includes land development followed by water development and delivery.

Table 7-3. Inputs for the Little Colorado River Valley Farms Construction

Event Year	Project Description	Sector	Cap Ex Budget
2021	Land and water development, water delivery	56	\$28,551,424
2021	Construction of farm facilities, equipment	55	\$24,472,649
Total			\$53,024,073

Table 7-4. Total Economic Impact of the Little Colorado River Valley Farms Construction

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	548	\$26,774,817	\$28,871,923	(\$2,622,667)	\$53,024,073
Indirect	55	\$2,685,219	\$4,649,926	\$1,829,589	\$9,164,734
Induced	107	\$4,767,760	\$6,161,421	\$4,090,629	\$15,019,810
Total	710	\$34,227,796	\$39,683,269	\$3,297,552	\$77,208,618

7.1.4 Operation of the Little Colorado River Valley Farms Project

The 2020 Recovery Plan provides budget estimates for ongoing operations of this project. Thus, the annual operating impact has been modeled and is presented.

The budget for organizational development and youth capacity building scales linearly from the 100-acre budget. This may not be the case upon implementation. While management and education expenses would increase with the project's size, economies of scale would have an effect. Rather than \$10 million per year, we assume each of these expenditures to be \$2 million per year.

Table 7-5. Inputs for the Little Colorado River Valley Farms Annual Operations

Event Year	Project Description	Sector	Cap Ex Budget
2021	Annual Crop Production	2	\$7,280,613
2021	Water Quality Monitoring	49	\$2,651,204
2021	Organizational Development	469	\$2,039,387
2021	Youth Capacity Building	482	\$2,039,387
Total			\$14,010,592

Table 7-6. Total Economic Impact of the Little Colorado River Valley Farms Annual Operations

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	350	\$4,241,235	\$6,427,502	\$3,278,827	\$13,947,564
Indirect	25	\$1,023,851	\$1,944,741	\$670,221	\$3,638,813

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Induced	19	\$865,624	\$1,118,662	\$742,479	\$2,726,765
Total	394	\$6,130,710	\$9,490,905	\$4,691,527	\$20,313,143

7.1.5 Livestock and Water Projects

The 2020 Recovery Plan explains that region-wide investment in livestock infrastructure is decades behind and necessary. This IMPLAN model does not include non-construction or “other” expenses. Also, we assume the impoundment repair is carried out by the Navajo Department of Water Resources at the cost of \$6 million as described in the 2020 Recovery Plan.

Table 7-7. Inputs for the Livestock and Water Projects

Event Year	Project Description	Sector	Cap Ex Budget
2021	Livestock water components	56	\$3,067,145
2021	Livestock power components	52	\$173,858
2021	Impoundment repair and maintenance	60	\$6,118,162
Total			\$9,359,165

Table 7-8. Total Economic Impact of the Livestock and Water Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	69	\$3,412,680	\$5,685,576	\$260,910	\$9,359,165
Indirect	14	\$672,967	\$1,050,903	\$509,699	\$2,233,569
Induced	15	\$662,294	\$855,888	\$568,230	\$2,086,412
Total	98	\$4,747,940	\$7,592,367	\$1,338,839	\$13,679,146

7.1.6 Tuba City Airport

The 2020 Recovery Plan references the Tuba City Airport Layout Plan, which calls for \$13.3 million in airport improvements. As a side note, the Tuba City Airport received \$20,000 in 2020 from the initial round of Coronavirus Aid, Relief, and Economic Security (CARES) Act funding.

Table 7-9. Inputs for the Tuba City Airport Improvements

Event Year	Project Description	Sector	Cap Ex Budget
2021	Tuba City Airport Improvements	56	\$13,357,988

Table 7-10. Total Economic Impact of the Tuba City Airport Improvements

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	159	\$7,918,236	\$7,725,101	(\$2,285,350)	\$13,357,988
Indirect	16	\$797,298	\$1,321,015	\$555,775	\$2,674,089
Induced	32	\$1,409,906	\$1,822,032	\$1,209,736	\$4,441,673
Total	207	\$10,125,440	\$10,868,148	(\$519,838)	\$20,473,750

7.1.7 Other Immediate Recovery Projects

Various other projects described in the 2020 Regional Plan appear to be ready for immediate development. Most of these projects are commercial and industrial site infrastructure developments. The Bodaway Gap Chapter 100-acre site is included based on approvals described in the 2020 Recovery Plan even though a capital budget is not provided. This project's \$5 million figure is an estimate based on professional judgment and consistent with similar projects on a per-acre basis.

Table 7-11. Inputs for the Other Economic Development Projects

Event Year	Project Description	Sector	Cap Ex Budget
2021	Bodaway Gap Echo Cliffs Veterans Facility	55	\$2,284,114
2021	Tuba City RBDO Business Information Center	55	\$2,549,234
2021	Tonalea Commercial Site	55	\$1,733,479
2021	Kerley Valley Commercial - Light industrial site	55	\$1,346,047
2021	Bodaway Gap Econ Development Site 100 acre	55	\$5,098,469
Total			\$13,011,343

Table 7-12. Total Economic Impact of the Other Economic Development Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	110	\$5,237,119	\$6,571,562	\$1,202,661	\$13,011,343
Indirect	10	\$521,604	\$971,030	\$341,158	\$1,833,792
Induced	21	\$932,665	\$1,205,294	\$800,126	\$2,938,085
Total	141	\$6,691,388	\$8,747,886	\$2,343,945	\$17,783,220

7.2 Total Economic Impact of Immediate Recovery Projects

The combined Immediate Recovery Projects' capital budgets are \$257 million, which includes \$14 million for the first year of operating Little Colorado River Farms. The total economic impact, including indirect and induced spending, is \$355 million. If all this activity were to take place in 1 year, a total of 421 jobs would be supported.

Otherwise, the number of annual jobs will vary with the number of years and amount of investment taking place in each year.

Table 7-13. Total Economic Impact of All Immediate Recovery Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	328	\$102,479,269	\$124,471,231	\$29,927,323	\$256,877,823
Indirect	34	\$11,632,166	\$20,666,453	\$7,750,660	\$40,049,279
Induced	59	\$18,479,596	\$23,881,346	\$15,855,283	\$58,216,225
Total	421	\$132,591,031	\$169,019,030	\$53,533,265	\$355,143,326

Table 7-14 breaks down, by tax category, the \$22.5 million in tax revenues that result from the direct Immediate Recovery Project investments. An additional \$5.1 million in tax revenue is generated from indirect economic activity, and \$7.7 million results from induced spending. In total, the \$257 million of this investment will generate \$35.4 million in tax revenue.

Table 7-14. Tax Revenue Impacts of All Immediate Recovery Projects

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$396,064	\$603,255	\$304,625	\$2,642,913	\$18,558,290	\$22,505,147
Indirect	\$429,240	\$635,556	\$327,945	\$1,380,878	\$2,354,972	\$5,128,590
Induced	\$588,772	\$872,221	\$449,885	\$1,942,360	\$3,867,938	\$7,721,177
Total	\$1,414,075	\$2,111,032	\$1,082,455	\$5,966,151	\$24,781,200	\$35,354,914

Table 7-15 shows the top 15 industry sectors most impacted by all Immediate Recovery Project investments. The type of impact is shown as well. Real estate, agriculture, medical, and restaurants are among the top sectors impacted after construction.

Table 7-15 Total Economic Impact by Industry of All Immediate Recovery Projects for the Top 15 Industries

Economic Sector\Total Output	Direct	Indirect	Induced	Total
50 - Construction of new health care structures	\$154,177,690	\$0	\$0	\$154,177,690
56 - Construction of other new nonresidential structures	\$44,976,557	\$0	\$0	\$44,976,557
55 - Construction of new commercial structures, including farm	\$37,483,992	\$0	\$0	\$37,483,992
449 - Owner-occupied dwellings	\$0	\$0	\$9,845,457	\$9,845,457
447 - Other real estate	\$0	\$5,360,503	\$2,608,580	\$7,969,083
2 - Grain farming	\$7,265,192	\$41	\$2	\$7,265,236

Economic Sector\Total Output	Direct	Indirect	Induced	Total
60 - Maintenance and repair construction of nonresidential structures	\$6,118,162	\$275,364	\$175,034	\$6,568,560
490 - Hospitals	\$0	\$0	\$6,364,797	\$6,364,797
405 - Retail - building material, garden equip, supplies stores	\$0	\$3,479,063	\$352,279	\$3,831,342
396 - Wholesale - Other durable goods merchant wholesalers	\$0	\$3,507,148	\$196,195	\$3,703,343
483 - Offices of physicians	\$0	\$0	\$2,909,505	\$2,909,505
417 - Truck transportation	\$0	\$2,450,289	\$329,787	\$2,780,076
49 - Water, sewage and other systems	\$2,631,795	\$33,278	\$49,820	\$2,714,893
510 - Limited-service restaurants	\$0	\$78,043	\$2,432,027	\$2,510,070
509 - Full-service restaurants	\$0	\$234,999	\$2,153,477	\$2,388,476

8. Socioeconomic Analysis of the FBFA

The direct economic impact of the recovery projects modeled in this analysis is \$3.6 billion and the total impact is over \$5.2 billion. In comparison, the total economic output of Coconino County in 2018 was \$12.1 billion. Thus, if all of the projects were implemented in 1 year, the county's economy's size would increase by 42 percent.

8.1 Total Combined Economic Impact of All Recovery Projects

Table 8-1 summarizes all of the capital spending and resulting economic impacts for each group of projects and presents a total of the economic impacts. A total of 40,514 annual jobs will be supported throughout construction, generating over \$2 billion in labor income.

Table 8-1. Total Economic Impact of Implementing the 2020 Recovery Plan for the FBFA

Total Economic Impact of All Chapter-Specific Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	27,335	\$1,348,273,121	\$1,371,681,891	\$269,357,285	\$2,989,312,297
Indirect	3,869	\$176,745,245	\$269,686,884	\$130,508,192	\$576,940,320
Induced	5,525	\$246,998,940	\$319,199,083	\$211,917,865	\$778,115,888
Total	36,729	\$1,772,017,305	\$1,960,567,858	\$611,783,342	\$4,344,368,505
Total Economic Impact of All Nine Chapter Infrastructure Capital Improvement Plan Projects					
Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	2,530	\$122,888,236	\$168,263,290	\$46,869,597	\$338,021,123
Indirect	330	\$16,241,595	\$27,857,820	\$11,226,485	\$55,325,901
Induced	504	\$22,535,259	\$29,122,565	\$19,333,612	\$70,991,436
Total	3,364	\$161,665,091	\$225,243,676	\$77,429,694	\$464,338,460
Total Economic Impact of All Immediate Recovery Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	328	\$102,479,269	\$124,471,231	\$29,927,323	\$256,877,823
Indirect	34	\$11,632,166	\$20,666,453	\$7,750,660	\$40,049,279
Induced	59	\$18,479,596	\$23,881,346	\$15,855,283	\$58,216,225
Total	421	\$132,591,031	\$169,019,030	\$53,533,265	\$355,143,326
Grand Total Economic Impact of All Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	30,193	\$1,573,640,625	\$1,664,416,413	\$346,154,205	\$3,584,211,243

Total Economic Impact of All Chapter-Specific Projects					
Indirect	4,233	\$204,619,007	\$318,211,157	\$149,485,336	\$672,315,500
Induced	6,088	\$288,013,795	\$372,202,995	\$247,106,760	\$907,323,549
Total	40,514	\$2,066,273,427	\$2,354,830,564	\$742,746,301	\$5,163,850,292

One of the County's key construction sectors (56) is running a deficit captured in IMPLAN model outputs. This may lead to modest underestimates of the impacts arising from that sector.

8.2 Coconino County Economy

8.2.1 Size of Coconino County Economy

The Recovery Plan implementation's overall scope is very large relative to the size of the County's economy. Even with phasing, implementing the Plan will have a substantial impact on the local and regional economy.

From 2010 through 2018, the total output of Coconino County grew by \$3.7 billion, just over the amount budgeted for all of the Recovery Plan projects combined.

Table 8-2. Comparison of Total County Output with Grand Total Recovery Plan Output

	Jobs	Labor Income	Total Output
Coconino County 2010	73,361	\$3,068,874,087	\$8,392,458,745
Coconino County 2018	85,890	\$4,285,298,032	\$12,131,467,889
2020 Recovery Plan	40,514	\$2,066,273,427	\$5,163,850,292

Health care comprises more than 15 percent of the County's economic activity.

Table 8-3. Top 10 Largest Economic Sectors in Coconino County in 2018

Sector	Industry Description	Jobs	Labor Income	Total Output	Cty share
377	Surgical appliance/supplies manufacturing	2,469	\$297,383,210	\$1,150,809,768	9.5%
490	Hospitals	3,970	\$350,841,602	\$747,096,279	6.2%
449	Owner-occupied dwellings	0	\$0	\$602,062,580	5.0%
447	Other real estate	3,260	\$86,303,227	\$581,249,872	4.8%
534	Other local government enterprises	1,067	\$115,164,270	\$420,007,623	3.5%
507	Hotels, motels, including casino hotels	3,439	\$110,374,423	\$347,176,872	2.9%
63	Dog and cat food manufacturing	234	\$23,080,182	\$337,269,097	2.8%
546	Federal govt, non-military	2,500	\$259,122,706	\$336,509,069	2.8%
542	Local govt, education	4,022	\$270,636,717	\$314,159,798	2.6%
509	Full-service restaurants	4,334	\$129,640,843	\$306,112,985	2.5%

8.2.2 Coconino County Construction Sector

The implementation of the Recovery Plan would directly impact fourteen economic sectors involving construction and maintenance. They have been identified throughout this report. In 2010, the total combined output of these sectors was almost \$400 million. By 2018, the output had grown over 20 percent to \$531 million or \$132 million over eight years. Phasing over 7 years would support 4,313 annual jobs or more than double the county's total construction sector size. This raises the question of where workers will come from and live during construction.

Table 8-4. Comparison of County's Construction Output with Recovery Plan's Direct Output

	Jobs	Labor Income	Total Output
Coconino Construction Sectors 2010	3,453	\$151,815,868	\$399,368,808
Coconino Construction Sectors 2018	3,891	\$182,702,584	\$531,744,723
Recovery Plan 2020 Total Direct Output	30,193	\$1,573,640,625	\$3,584,211,243

8.3 Demographic Trends and Impacts

8.3.1 Population trends

According to the 2008 Recovery Plan, the collective population of the nine Chapters in 2000 was 19,718. The population was projected to reach 22,928 by 2010 and grow to 26,370 by 2020. The 2008 Recovery Plan indicates that the 2020 population projection is the basis for their housing demand forecast. We now know that the 2020 actual population is much less than previously projected. To the extent that the 2020 Recovery Plan is based on 2008 Recovery Plan budgets, the amount of housing proposed may be more than is needed.

Table 8-5. Estimates of population and housing needs over time

Population and Housing Estimates	2008-2010	2020 P	2020 A
Total Nine Chapters' population	22,928	26,370	20,425
FBFA population	7,874	9,056	6,872
FBFA habitable housing units	585	585	585
FBFA total housing units needed	2,088	2,402	1,823
FBFA new housing units needed	1,503	1,817	1,238

Source: 2008 and 2020 Recovery Plans.

8.3.2 Planned housing development within the FBFA

The 2008 Recovery Plan estimates were based on the assumption that an average of 3.77 people live in each housing unit. Survey data supported this assumption. The budgets presented in the 2020 Recovery Plan correspond to a total of 1,917 new housing units within the FBFA (scattered, multifamily, and clustered), not including new group housing such as senior living facilities. These plans also proposed the repair of 905 units within the FBFA. Thus, a total of at least 2,822 new or repaired housing units are being proposed for within the FBFA for an estimated population of 6,872 in 2020.

Table 8-6. Chapter-Specific Housing Plans compared to FBFA population

Chapter	Scattered	Multi	Repair	Total Units	FBFA pop.	People/Unit
Bodaway Gap	284	193	213	690	1,715	2.49
Cameron	207	147	149	503	1,192	2.37
Coalmine Canyon	80	92	96	268	584	2.18
Coppermine	53	38	39	130	361	2.78
Kaibeto	27	19	19	65	179	2.76
Leupp	3	2	10	15	57	3.81
Tolani Lake	64	45	46	155	344	2.22
Tonalea	116	83	84	283	557	1.97
Tuba City	286	178	249	713	1,881	2.64
Total	1,120	797	905	2,822	6,872	2.44

All of the new housing units are planned to be 1,200 sq ft. in size. The construction cost is budgeted at \$437.40 in 2010 dollars, which corresponds to \$592.47 in 2020 dollars. We believe this overestimates current construction costs. Further investigation may reduce the capital expenditure needed to develop the necessary amount of housing.

8.3.3 Jobs

Employment within Coconino county comprises almost 60 percent of the population. Over the past decade, the number of jobs within the County increased by 12,529. The average annual number of jobs supported by the Chapter-Specific Projects and Infrastructure Capital Improvement Plan programs is almost half that 10-year increase.

The nine FBFA Chapters population is roughly 14 percent of the county population, and the FBFA population is a third of the Nine Chapters.

Implementing the Recovery Plan will undoubtedly bring the County to full employment and most likely require additional workers outside of the County.

Table 8-7. Estimates of population and jobs compared to the Recovery Plan Job Impacts

Population and Jobs Estimates	2008-2010	2018-2020
Coconino County Population	134,618	146,348
Coconino County Employment	73,361	85,890
Total Nine Chapters' population	22,928	20,425
FBFA population	7,874	6,872
Total Immediate Recovery Jobs		421
Avg Annual CSP and ICIP Jobs (7 yrs)		5,728

8.3.4 School Construction

The 2008 and 2020 Recovery Plans propose constructing over 336,000 square feet of educational facilities from daycare through adult education across 32 different facilities. At 100 sq ft/student, this amount of educational space would accommodate 3,361 students. An amount of 100 sq ft/student is at the higher end of national averages. For a total population of 6,872, the Recovery Plans may be overestimating the number of educational facilities necessary.

Budgeted construction costs range from \$400/sq ft to almost \$600/sq ft in 2010 dollars, which corresponds to a range of approximately \$500 to \$740/sq ft in 2020 dollars.

8.4 Lifestyle Trade-Offs

Developing the FBFA by implementing the 2020 Recovery Plan will improve the area's residents' health, well-being, and quality of life. Investment in agriculture, building and renovating Chapter Houses, and other projects consistent with Navajo culture and the region's rural character will help preserve cultural values but may not attract further investment in the future. These are important trade-offs to consider. The solution is to develop sustainable funding mechanisms to support the heritage projects that sustain and preserve cultural values.

Similar trade-offs exist in the housing sector. Housing is needed. A variety is proposed from elder living facilities to multifamily and scattered. In general, higher density housing will be more affordable and will impact fewer acres of the landscape. However, higher-density housing is not consistent with a rural lifestyle.

8.4.1 Solar Energy

The 2020 Recovery Plan points to the benefits of renewable energy in job creation and improving the environment. Further, the closure of the Navajo Generating Station creates an opportunity to replace its power generation.

Arizona offers high solar generation capacity. Large scale solar generation facilities are being developed across the country. For example, Navajo Power proposes developing a 750-megawatt photovoltaic solar-generating and battery energy storage system facility in the Cameron and Coalmine Canyon Chapters within the FBFA.

8.4.2 Environmental Restoration

Decades of uranium mining in the region have left a legacy of pollution that still needs to be cleaned up. Clean water and a safe environment are necessary building blocks of desirable and sustainable economies. However, mitigation is expensive. The 2020 Recovery Plan does not provide clean-up cost estimates. However, to the extent that efficiencies and savings can be found in other aspects of the Recovery Plan, those funds should be considered for environmental restoration.

8.4.3 Telecommunications

The 2020 Recovery Plan acknowledges the development of cyber and broadband infrastructure. The plan references a 2018 comprehensive survey. Indeed, modernizing the FBFA and Navajo Nation's communication infrastructure will enhance communication and the flow of information, but may also dilute local cultural values. The solution is to develop resources that enable the use of cyber technology for promoting cultural values.

8.4.4 Business and Commercial Sites

The 2020 Recovery Plan lists a number of business and commercial sites for potential development. While developing the infrastructure for these sites should lead to subsequent investment, business development, and job creation, there is a danger that commercial and light industrial jobs will not be consistent with the rural and cultural values of the region. Planning, zoning, and incentives should be considered from the beginning as mechanisms for ensuring the development of these sites will serve to create economic benefits that fit with the local values and Navajo heritage.

8.5 Cumulative Impacts

Tourism will be a primary cumulative impact. Improved transportation systems, broadband development, environmental restoration, and other developments described in this analysis will create a more desirable region to visit. The 2020 Recovery Plan describes the tourism industry as “one very bright spot for Navajo” and describes how the Navajo Nation is at the center of the Grand Circle.

Many outside groups are scoping and proposing recreation and tourism projects in the area. The Grand Canyon National Park is nearby. Hozho Hotels and Resorts presents a \$30 million 4-star hotel business model, and the Recovery Plan points to possible locations within and outside of the FBFA. Developing the tourism industry will create jobs and economic impact; however, many jobs would pay lower wages. Tourism developments near scenically desirable yet environmentally sensitive locations will be controversial.

9. Summary

The objective of this economic impact and socioeconomic analysis is to quantify the impacts resulting from the implementation of the 2020 Recovery Plan. The IMPLAN economic impact model was used to estimate the job creation and multiplier effects of the various projects identified in the Recovery Plan.

Capital budget estimates were obtained for each project by reviewing previous plans, reports, and documents. These budget estimates were used as model inputs. A total of 326 projects and project components were modeled in IMPLAN.

The scale of the proposed development is substantial. The total economic impact of implementing the Recovery Plan is equivalent to 42 percent of Coconino County's economy. Whether or not the region has the resources necessary to implement the Recovery Plan, even if funded by outside investment, is an important question to consider.

Some of the proposed projects appear to be based on population growth estimates that did not materialize. Updating budget proposals based on current costs and community needs, prioritization, and phasing will be necessary for successful implementation.

10. Glossary

Dollar year: Is the year represented by the values in an Impact Event being modeled. This is usually (but not always) the same as the year in which your event occurred or is expected to occur.

Intermediate Expenditures: These are repeating everyday materials required to make a final product.

Jobs: The job impact counts are supported in the case of construction and created in the case of operations within the region that would result from this project. IMPLAN calculates direct, indirect and induced job impact estimates resulting from a project. Note that IMPLAN jobs are not equivalent to full-time employment. In IMPLAN, 1 job lasting 12 months = 2 jobs lasting 6 months each = 3 jobs lasting 4 months each. A job can be either full-time or part-time. Similarly, a job that lasts one quarter of the year would be 0.25 job.

Labor Income: Represents the total value of all forms of employment income paid throughout a defined economy during a specified period of time. It reflects the combined cost of total payroll paid to employees (e.g., wages and salaries, benefits, payroll taxes) and payments received by self-employed individuals and/or unincorporated business owners (e.g., capital consumption allowance) across the defined economy.

Other Property Income (OPI): All money collected by an industry that isn't paid into the operations of the company. This would include profits, capital consumption allowance, payments for rent, royalties, and interest income. This is also known as Gross Operational Surplus.

Output: This is the value of production by industry in a calendar year. Total output is the sum of labor income, OPI, TOPI, and intermediate expenditures.

Taxes on Production and Imports (TOPI): This impact category includes (sales tax, property tax, motor vehicle taxes, severance, excise, assessments, custom duties, and other taxes and fees) less government subsidies.

Appendix A – Chapter-Specific Plan Impact Category Details

IMPACTS OF TUBA CITY CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-1. Economic Impact of Tuba City Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	90	\$4,258,007	\$5,342,968	\$977,816	\$10,578,791
Indirect	9	\$424,087	\$789,490	\$277,376	\$1,490,953
Induced	17	\$758,297	\$979,957	\$650,537	\$2,388,792
Total	115	\$5,440,391	\$7,112,414	\$1,905,730	\$14,458,536
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	21	\$1,124,963	\$1,134,000	\$513,784	\$2,772,747
Indirect	2	\$97,959	\$184,135	\$66,117	\$348,211
Induced	4	\$197,032	\$254,624	\$169,138	\$620,794
Total	28	\$1,419,954	\$1,572,758	\$749,040	\$3,741,752
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,452	\$70,941,948	\$36,592,193	\$31,177,701	\$138,711,842
Indirect	138	\$6,114,525	\$8,918,625	\$4,461,385	\$19,494,534
Induced	279	\$12,486,065	\$16,135,910	\$10,711,272	\$39,333,247
Total	1,869	\$89,542,538	\$61,646,728	\$46,350,358	\$197,539,624
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,587	\$77,390,944	\$99,711,007	\$30,238,030	\$207,339,982
Indirect	354	\$15,599,589	\$21,935,783	\$12,070,852	\$49,606,223
Induced	338	\$15,089,714	\$19,500,615	\$12,945,560	\$47,535,889
Total	2,279	\$108,080,247	\$141,147,405	\$55,254,443	\$304,482,094
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	224	\$10,606,673	\$28,418,025	\$7,015,855	\$46,040,553
Indirect	99	\$4,385,408	\$6,180,856	\$3,576,785	\$14,143,048
Induced	55	\$2,436,487	\$3,148,691	\$2,090,545	\$7,675,724
Total	378	\$17,428,568	\$37,747,572	\$12,683,185	\$67,859,325

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	0	\$0	\$0	\$0	\$0
Indirect	0	\$0	\$0	\$0	\$0
Induced	0	\$0	\$0	\$0	\$0
Total	0	\$0	\$0	\$0	\$0
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	50	\$2,486,845	\$2,426,188	(\$717,749)	\$4,195,283
Indirect	5	\$250,404	\$414,885	\$174,550	\$839,839
Induced	10	\$442,803	\$572,237	\$379,936	\$1,394,976
Total	65	\$3,180,051	\$3,413,310	(\$163,263)	\$6,430,098
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	40	\$1,918,960	\$2,407,920	\$440,673	\$4,767,554
Indirect	4	\$191,124	\$355,800	\$125,005	\$671,929
Induced	8	\$341,743	\$441,638	\$293,178	\$1,076,559
Total	52	\$2,451,826	\$3,205,359	\$858,857	\$6,516,042

IMPACTS OF BODAWAY GAP CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-2. Economic Impact of Bodaway Gap Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	251	\$11,900,589	\$14,932,917	\$2,732,872	\$29,566,379
Indirect	24	\$1,185,269	\$2,206,524	\$775,232	\$4,167,025
Induced	47	\$2,119,345	\$2,738,856	\$1,818,169	\$6,676,370
Total	322	\$15,205,204	\$19,878,296	\$5,326,274	\$40,409,774
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	565	\$29,795,812	\$30,035,156	\$13,608,099	\$73,439,068

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Indirect	52	\$2,594,540	\$4,876,997	\$1,751,184	\$9,222,721
Induced	117	\$5,218,604	\$6,743,967	\$4,479,801	\$16,442,371
Total	734	\$37,608,956	\$41,656,120	\$19,839,084	\$99,104,160
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,683	\$82,250,917	\$42,425,413	\$36,147,788	\$160,824,119
Indirect	160	\$7,089,251	\$10,340,357	\$5,172,581	\$22,602,189
Induced	324	\$14,476,488	\$18,708,162	\$12,418,773	\$45,603,423
Total	2,167	\$103,816,657	\$71,473,931	\$53,739,143	\$229,029,731
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,576	\$76,849,749	\$99,013,727	\$30,026,576	\$205,890,052
Indirect	351	\$15,490,501	\$21,782,385	\$11,986,440	\$49,259,326
Induced	335	\$14,984,191	\$19,364,247	\$12,855,032	\$47,203,470
Total	2,263	\$107,324,441	\$140,160,360	\$54,868,048	\$302,352,848
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	189	\$8,931,274	\$23,929,196	\$5,907,651	\$38,768,122
Indirect	84	\$3,692,702	\$5,204,546	\$3,011,806	\$11,909,054
Induced	46	\$2,051,627	\$2,651,333	\$1,760,329	\$6,463,289
Total	318	\$14,675,603	\$31,785,075	\$10,679,786	\$57,140,464
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	287	\$14,886,422	\$18,762,760	\$8,160,575	\$41,809,757
Indirect	33	\$1,608,424	\$2,909,436	\$1,042,471	\$5,560,331
Induced	60	\$2,668,767	\$3,448,868	\$2,289,858	\$8,407,494
Total	380	\$19,163,614	\$25,121,064	\$11,492,904	\$55,777,582
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	115	\$5,695,857	\$5,556,928	(\$1,643,930)	\$9,608,856
Indirect	12	\$573,524	\$950,251	\$399,788	\$1,923,563

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Induced	23	\$1,014,193	\$1,310,649	\$870,205	\$3,195,047
Total	149	\$7,283,574	\$7,817,829	(\$373,938)	\$14,727,466
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	92	\$4,374,036	\$5,488,562	\$1,004,461	\$10,867,059
Indirect	9	\$435,643	\$811,003	\$284,935	\$1,531,581
Induced	17	\$778,961	\$1,006,660	\$668,264	\$2,453,885
Total	118	\$5,588,640	\$7,306,225	\$1,957,660	\$14,852,525

IMPACTS OF CAMERON CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-3. Economic Impact of Cameron Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	282	\$13,378,659	\$16,787,605	\$3,072,299	\$33,238,563
Indirect	27	\$1,332,481	\$2,480,577	\$871,517	\$4,684,575
Induced	53	\$2,382,570	\$3,079,025	\$2,043,989	\$7,505,584
Total	362	\$17,093,710	\$22,347,207	\$5,987,804	\$45,428,722
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	622	\$32,763,208	\$33,026,388	\$14,963,344	\$80,752,939
Indirect	57	\$2,852,933	\$5,362,702	\$1,925,586	\$10,141,221
Induced	128	\$5,738,330	\$7,415,605	\$4,925,949	\$18,079,884
Total	807	\$41,354,470	\$45,804,695	\$21,814,879	\$108,974,044
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,436	\$70,152,025	\$36,184,747	\$30,830,544	\$137,167,316
Indirect	136	\$6,046,441	\$8,819,318	\$4,411,708	\$19,277,467
Induced	276	\$12,347,035	\$15,956,240	\$10,592,005	\$38,895,280
Total	1,848	\$88,545,501	\$60,960,305	\$45,834,257	\$195,340,063
Scattered Housing		Labor	Intermediate	Taxes/	Total

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,149	\$56,013,725	\$72,168,456	\$21,885,567	\$150,067,749
Indirect	256	\$11,290,611	\$15,876,598	\$8,736,596	\$35,903,805
Induced	244	\$10,921,576	\$14,114,082	\$9,369,689	\$34,405,346
Total	1,649	\$78,225,913	\$102,159,136	\$39,991,852	\$220,376,900
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	132	\$6,228,297	\$16,687,220	\$4,119,749	\$27,035,265
Indirect	58	\$2,575,136	\$3,629,432	\$2,100,308	\$8,304,875
Induced	32	\$1,430,718	\$1,848,929	\$1,227,580	\$4,507,227
Total	222	\$10,234,151	\$22,165,581	\$7,447,636	\$39,847,367
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	367	\$18,983,400	\$23,926,567	\$10,406,493	\$53,316,459
Indirect	42	\$2,051,088	\$3,710,158	\$1,329,376	\$7,090,622
Induced	76	\$3,403,254	\$4,398,051	\$2,920,063	\$10,721,368
Total	485	\$24,437,742	\$32,034,776	\$14,655,932	\$71,128,449
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	162	\$8,058,080	\$7,861,534	(\$2,325,711)	\$13,593,903
Indirect	17	\$811,379	\$1,344,346	\$565,590	\$2,721,316
Induced	32	\$1,434,806	\$1,854,210	\$1,231,101	\$4,520,118
Total	211	\$10,304,265	\$11,060,090	(\$529,019)	\$20,835,336
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	101	\$4,806,633	\$6,031,386	\$1,103,804	\$11,941,823
Indirect	10	\$478,729	\$891,212	\$313,115	\$1,683,056
Induced	19	\$856,001	\$1,106,220	\$734,356	\$2,696,577
Total	130	\$6,141,363	\$8,028,819	\$2,151,275	\$16,321,457

IMPACTS OF COALMINE CANYON CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-4. Economic Impact of Coalmine Canyon Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	228	\$10,827,363	\$13,586,227	\$2,486,415	\$26,900,005
Indirect	22	\$1,078,379	\$2,007,533	\$705,319	\$3,791,231
Induced	43	\$1,928,217	\$2,491,858	\$1,654,202	\$6,074,277
Total	293	\$13,833,958	\$18,085,619	\$4,845,936	\$36,765,513
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	254	\$13,412,708	\$13,520,450	\$6,125,742	\$33,058,900
Indirect	24	\$1,167,943	\$2,195,400	\$788,303	\$4,151,646
Induced	53	\$2,349,176	\$3,035,824	\$2,016,601	\$7,401,601
Total	330	\$16,929,827	\$18,751,674	\$8,930,646	\$44,612,147
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	832	\$40,673,713	\$20,979,694	\$17,875,360	\$79,528,766
Indirect	79	\$3,505,689	\$5,113,386	\$2,557,881	\$11,176,957
Induced	160	\$7,158,735	\$9,251,330	\$6,141,179	\$22,551,244
Total	1,071	\$51,338,137	\$35,344,410	\$26,574,420	\$113,256,967
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	444	\$21,647,817	\$27,891,191	\$8,458,190	\$57,997,198
Indirect	99	\$4,363,521	\$6,135,883	\$3,376,462	\$13,875,867
Induced	94	\$4,220,899	\$5,454,718	\$3,621,136	\$13,296,752
Total	637	\$30,232,237	\$39,481,792	\$15,455,788	\$85,169,816
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	51	\$2,423,744	\$6,493,838	\$1,603,202	\$10,520,785
Indirect	23	\$1,002,115	\$1,412,395	\$817,336	\$3,231,846
Induced	12	\$556,765	\$719,511	\$477,713	\$1,753,989
Total	86	\$3,982,624	\$8,625,745	\$2,898,251	\$15,506,620

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	41	\$2,098,394	\$2,644,803	\$1,150,317	\$5,893,513
Indirect	5	\$226,724	\$410,115	\$146,947	\$783,786
Induced	8	\$376,190	\$486,153	\$322,779	\$1,185,122
Total	54	\$2,701,308	\$3,541,071	\$1,620,042	\$7,862,421
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	29	\$1,449,128	\$1,413,782	(\$418,245)	\$2,444,665
Indirect	3	\$145,915	\$241,761	\$101,713	\$489,389
Induced	6	\$258,029	\$333,453	\$221,396	\$812,877
Total	38	\$1,853,072	\$1,988,996	(\$95,136)	\$3,746,932
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	150	\$7,120,444	\$8,934,767	\$1,635,151	\$17,690,363
Indirect	14	\$709,179	\$1,320,223	\$463,842	\$2,493,243
Induced	28	\$1,268,061	\$1,638,731	\$1,087,860	\$3,994,652
Total	193	\$9,097,684	\$11,893,721	\$3,186,853	\$24,178,258

IMPACTS OF COPPERMINE CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-5. Economic Impact of Coppermine Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	32	\$1,506,239	\$1,890,036	\$345,895	\$3,742,171
Indirect	3	\$150,018	\$279,276	\$98,120	\$527,414
Induced	6	\$268,242	\$346,653	\$230,123	\$845,018
Total	41	\$1,924,499	\$2,515,965	\$674,138	\$5,114,602
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	65	\$3,450,893	\$3,478,613	\$1,576,064	\$8,505,570
Indirect	6	\$300,495	\$564,844	\$202,819	\$1,068,158
Induced	14	\$604,409	\$781,073	\$518,842	\$1,904,323
Total	85	\$4,355,796	\$4,824,531	\$2,297,724	\$11,478,051
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	326	\$15,913,945	\$8,208,488	\$6,993,891	\$31,116,324
Indirect	31	\$1,371,632	\$2,000,657	\$1,000,793	\$4,373,082
Induced	63	\$2,800,918	\$3,619,664	\$2,402,790	\$8,823,371
Total	419	\$20,086,494	\$13,828,809	\$10,397,474	\$44,312,778
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	294	\$14,341,678	\$18,477,914	\$5,603,551	\$38,423,143
Indirect	66	\$2,890,833	\$4,065,023	\$2,236,906	\$9,192,762
Induced	63	\$2,796,346	\$3,613,750	\$2,399,002	\$8,809,098
Total	422	\$20,028,857	\$26,156,687	\$10,239,460	\$56,425,003
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	34	\$1,625,603	\$4,355,410	\$1,075,266	\$7,056,279
Indirect	15	\$672,118	\$947,292	\$548,186	\$2,167,595
Induced	8	\$373,421	\$482,576	\$320,402	\$1,176,399
Total	58	\$2,671,142	\$5,785,278	\$1,943,854	\$10,400,273

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	19	\$986,245	\$1,243,057	\$540,649	\$2,769,951
Indirect	2	\$106,560	\$192,754	\$69,065	\$368,379
Induced	4	\$176,809	\$228,492	\$151,706	\$557,007
Total	25	\$1,269,615	\$1,664,303	\$761,420	\$3,695,338
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	0	\$0	\$0	\$0	\$0
Indirect	0	\$0	\$0	\$0	\$0
Induced	0	\$0	\$0	\$0	\$0
Total	0	\$0	\$0	\$0	\$0
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	77	\$3,670,855	\$4,606,207	\$842,982	\$9,120,043
Indirect	7	\$365,608	\$680,624	\$239,128	\$1,285,360
Induced	15	\$653,733	\$844,827	\$560,832	\$2,059,393
Total	99	\$4,690,196	\$6,131,658	\$1,642,942	\$12,464,796

IMPACTS OF KAIBETO CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-6. Economic Impact of Kaibeto Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	18	\$848,898	\$1,065,202	\$194,943	\$2,109,042
Indirect	2	\$84,548	\$157,397	\$55,299	\$297,244
Induced	3	\$151,178	\$195,369	\$129,694	\$476,242
Total	23	\$1,084,625	\$1,417,968	\$379,936	\$2,882,528
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	56	\$2,948,689	\$2,972,375	\$1,346,701	\$7,267,765

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Indirect	5	\$256,764	\$482,643	\$173,303	\$912,710
Induced	12	\$516,450	\$667,404	\$443,335	\$1,627,190
Total	73	\$3,721,902	\$4,122,423	\$1,963,339	\$9,807,664
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	167	\$8,138,717	\$4,197,989	\$3,576,819	\$15,913,525
Indirect	16	\$701,480	\$1,023,177	\$511,826	\$2,236,484
Induced	32	\$1,432,447	\$1,851,170	\$1,228,836	\$4,512,453
Total	214	\$10,272,644	\$7,072,336	\$5,317,481	\$22,662,462
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	150	\$7,306,138	\$9,413,277	\$2,854,639	\$19,574,054
Indirect	33	\$1,472,688	\$2,070,861	\$1,139,556	\$4,683,105
Induced	32	\$1,424,553	\$1,840,967	\$1,222,133	\$4,487,654
Total	215	\$10,203,380	\$13,325,105	\$5,216,328	\$28,744,813
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	17	\$798,142	\$2,138,428	\$527,936	\$3,464,506
Indirect	7	\$329,998	\$465,103	\$269,149	\$1,064,250
Induced	4	\$183,343	\$236,936	\$157,311	\$577,591
Total	28	\$1,311,482	\$2,840,467	\$954,397	\$5,106,346
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	5	\$260,576	\$328,429	\$142,845	\$731,850
Indirect	1	\$28,154	\$50,928	\$18,248	\$97,330
Induced	1	\$46,715	\$60,370	\$40,082	\$147,167
Total	7	\$335,445	\$439,726	\$201,175	\$976,346
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	138	\$6,827,040	\$6,660,520	(\$1,970,410)	\$11,517,150
Indirect	14	\$687,424	\$1,138,969	\$479,185	\$2,305,578

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Induced	27	\$1,215,609	\$1,570,941	\$1,043,025	\$3,829,575
Total	179	\$8,730,074	\$9,370,430	(\$448,201)	\$17,652,303
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	9	\$432,597	\$542,825	\$99,342	\$1,074,764
Indirect	1	\$43,086	\$80,209	\$28,180	\$151,475
Induced	2	\$77,040	\$99,560	\$66,092	\$242,692
Total	12	\$552,723	\$722,594	\$193,615	\$1,468,931

IMPACTS OF LEUPP CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-7. Economic Impact of Leupp Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	2	\$102,596	\$128,737	\$23,560	\$254,893
Indirect	0	\$10,218	\$19,023	\$6,683	\$35,924
Induced	0	\$18,271	\$23,612	\$15,675	\$57,557
Total	3	\$131,085	\$171,372	\$45,918	\$348,375
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	2	\$130,381	\$131,428	\$59,546	\$321,355
Indirect	0	\$11,353	\$21,341	\$7,663	\$40,357
Induced	1	\$22,836	\$29,510	\$19,603	\$71,949
Total	3	\$164,569	\$182,279	\$86,812	\$433,660
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	17	\$853,007	\$439,985	\$374,881	\$1,667,873
Indirect	2	\$73,521	\$107,238	\$53,644	\$234,403
Induced	3	\$150,133	\$194,018	\$128,793	\$472,944
Total	22	\$1,076,661	\$741,241	\$557,317	\$2,375,219
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Direct	17	\$811,793	\$1,045,920	\$317,182	\$2,174,895
Indirect	4	\$163,632	\$230,096	\$126,617	\$520,345
Induced	4	\$158,284	\$204,552	\$135,793	\$498,628
Total	24	\$1,133,709	\$1,480,567	\$579,592	\$3,193,868
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	9	\$448,169	\$1,200,762	\$296,445	\$1,945,375
Indirect	4	\$185,299	\$261,163	\$151,132	\$597,594
Induced	2	\$102,950	\$133,043	\$88,333	\$324,326
Total	16	\$736,418	\$1,594,968	\$535,909	\$2,867,295
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	2	\$117,684	\$148,328	\$64,513	\$330,524
Indirect	0	\$12,715	\$23,000	\$8,241	\$43,957
Induced	0	\$21,098	\$27,265	\$18,102	\$66,465
Total	3	\$151,497	\$198,593	\$90,856	\$440,946
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	0	\$0	\$0	\$0	\$0
Indirect	0	\$0	\$0	\$0	\$0
Induced	0	\$0	\$0	\$0	\$0
Total	0	\$0	\$0	\$0	\$0
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1	\$48,066	\$60,314	\$11,038	\$119,418
Indirect	0	\$4,787	\$8,912	\$3,131	\$16,831
Induced	0	\$8,560	\$11,062	\$7,344	\$26,966
Total	1	\$61,414	\$80,288	\$21,513	\$163,215

IMPACTS OF TOLANI LAKE CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-8. Economic Impact of Tolani Lake Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	115	\$5,448,995	\$6,837,425	\$1,251,317	\$13,537,737
Indirect	11	\$542,706	\$1,010,314	\$354,960	\$1,907,981
Induced	22	\$970,397	\$1,254,056	\$832,496	\$3,056,950
Total	147	\$6,962,099	\$9,101,796	\$2,438,773	\$18,502,667
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	109	\$5,758,851	\$5,805,111	\$2,630,135	\$14,194,097
Indirect	10	\$501,465	\$942,612	\$338,464	\$1,782,542
Induced	23	\$1,008,637	\$1,303,455	\$865,843	\$3,177,935
Total	142	\$7,268,954	\$8,051,178	\$3,834,443	\$19,154,575
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	373	\$18,251,123	\$9,414,016	\$8,021,038	\$35,686,177
Indirect	35	\$1,573,074	\$2,294,480	\$1,147,773	\$5,015,328
Induced	72	\$3,212,270	\$4,151,260	\$2,755,672	\$10,119,203
Total	481	\$23,036,468	\$15,859,757	\$11,924,484	\$50,820,708
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	355	\$17,318,253	\$22,312,953	\$6,766,552	\$46,397,758
Indirect	79	\$3,490,817	\$4,908,707	\$2,701,170	\$11,100,693
Induced	76	\$3,376,719	\$4,363,774	\$2,896,909	\$10,637,402
Total	510	\$24,185,789	\$31,585,433	\$12,364,631	\$68,135,853
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	41	\$1,916,936	\$5,135,968	\$1,267,970	\$8,320,874
Indirect	18	\$792,571	\$1,117,061	\$646,430	\$2,556,062
Induced	10	\$440,344	\$569,061	\$377,823	\$1,387,228
Total	68	\$3,149,852	\$6,822,090	\$2,292,222	\$12,264,164

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	21	\$1,102,431	\$1,389,498	\$604,341	\$3,096,269
Indirect	2	\$119,114	\$215,462	\$77,201	\$411,777
Induced	4	\$197,639	\$255,410	\$169,578	\$622,627
Total	28	\$1,419,183	\$1,860,369	\$851,120	\$4,130,673
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	0	\$0	\$0	\$0	\$0
Indirect	0	\$0	\$0	\$0	\$0
Induced	0	\$0	\$0	\$0	\$0
Total	0	\$0	\$0	\$0	\$0
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	50	\$2,355,250	\$2,955,379	\$540,864	\$5,851,493
Indirect	5	\$234,577	\$436,694	\$153,426	\$824,697
Induced	9	\$419,440	\$542,048	\$359,835	\$1,321,323
Total	64	\$3,009,268	\$3,934,121	\$1,054,125	\$7,997,514

IMPACTS OF TONALEA CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-9. Economic Impact of Tonalea Chapter-Specific Projects by Category

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	56	\$2,645,512	\$3,319,601	\$607,520	\$6,572,634
Indirect	5	\$263,486	\$490,512	\$172,335	\$926,334
Induced	11	\$471,132	\$608,850	\$404,181	\$1,484,163
Total	72	\$3,380,131	\$4,418,964	\$1,184,036	\$8,983,130
Education		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	80	\$4,194,155	\$4,227,846	\$1,915,520	\$10,337,521
Indirect	7	\$365,216	\$686,502	\$246,502	\$1,298,220

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Induced	16	\$734,588	\$949,303	\$630,591	\$2,314,482
Total	103	\$5,293,959	\$5,863,651	\$2,792,614	\$13,950,223
Multifamily Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	673	\$32,869,958	\$16,954,480	\$14,445,751	\$64,270,190
Indirect	64	\$2,833,080	\$4,132,320	\$2,067,120	\$9,032,519
Induced	129	\$5,785,243	\$7,476,348	\$4,962,918	\$18,224,509
Total	866	\$41,488,281	\$28,563,148	\$21,475,789	\$91,527,218
Scattered Housing		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	644	\$31,389,334	\$40,442,227	\$12,264,376	\$84,095,937
Indirect	143	\$6,327,106	\$8,897,031	\$4,895,870	\$20,120,007
Induced	137	\$6,120,303	\$7,909,340	\$5,250,647	\$19,280,291
Total	924	\$43,836,743	\$57,248,598	\$22,410,893	\$123,496,234
Housing Repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	74	\$3,513,219	\$9,412,824	\$2,323,842	\$15,249,885
Indirect	33	\$1,452,567	\$2,047,268	\$1,184,729	\$4,684,563
Induced	18	\$807,031	\$1,042,932	\$692,446	\$2,542,409
Total	125	\$5,772,817	\$12,503,024	\$4,201,016	\$22,476,857
Health		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	15	\$768,271	\$968,324	\$421,158	\$2,157,752
Indirect	2	\$83,009	\$150,153	\$53,801	\$286,962
Induced	3	\$137,732	\$177,992	\$118,177	\$433,901
Total	20	\$989,012	\$1,296,469	\$593,135	\$2,878,615
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	107	\$5,314,003	\$5,184,388	(\$1,533,720)	\$8,964,671
Indirect	11	\$535,074	\$886,546	\$372,986	\$1,794,606
Induced	21	\$946,201	\$1,222,783	\$811,865	\$2,980,849

Community Facilities and Recreation		Labor	Intermediate	Taxes/	Total
Total	139	\$6,795,278	\$7,293,716	(\$348,868)	\$13,740,126
Public Safety		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	42	\$1,993,724	\$2,501,735	\$457,842	\$4,953,302
Indirect	4	\$198,570	\$369,662	\$129,876	\$698,108
Induced	8	\$355,057	\$458,845	\$304,601	\$1,118,503
Total	54	\$2,547,351	\$3,330,242	\$892,319	\$6,769,912

IMPACTS OF REGIONAL CHAPTER-SPECIFIC PROJECTS BY CATEGORY

Appendix Table A-10. Economic Impact of Regional Chapter-Specific Projects by Category

Housing repairs		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	32	\$1,582,521	\$3,926,777	\$759,586	\$6,268,884
Indirect	11	\$492,945	\$751,525	\$385,294	\$1,629,764
Induced	8	\$337,119	\$435,662	\$289,222	\$1,062,003
Total	51	\$2,412,584	\$5,113,964	\$1,434,103	\$8,960,650
Hospital		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	476	\$24,657,002	\$31,077,542	\$13,516,700	\$69,251,243
Indirect	54	\$2,664,100	\$4,819,020	\$1,726,689	\$9,209,809
Induced	99	\$4,420,390	\$5,712,504	\$3,792,787	\$13,925,682
Total	629	\$31,741,492	\$41,609,066	\$19,036,176	\$92,386,734
Infrastructure		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	6,955	\$345,306,346	\$336,883,901	(\$99,661,801)	\$582,528,447
Indirect	714	\$34,769,383	\$57,608,160	\$24,236,780	\$116,614,323
Induced	1,375	\$61,484,566	\$79,456,969	\$52,755,387	\$193,696,922
Total	9,044	\$441,560,295	\$473,949,030	(\$22,669,634)	\$892,839,692
Transportation		Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output

Housing repairs		Labor	Intermediate	Taxes/	Total
Direct	1,151	\$56,401,204	\$67,224,673	(\$11,066,755)	\$112,559,122
Indirect	241	\$10,483,661	\$14,591,032	\$8,043,524	\$33,118,217
Induced	243	\$10,845,666	\$14,015,979	\$9,304,688	\$34,166,333
Total	1,635	\$77,730,531	\$95,831,684	\$6,281,457	\$179,843,672

Appendix B – Chapter-Specific Plan Impact Phasing Details

IMPACT OF CHAPTER-SPECIFIC COMMUNITY AND REC FACILITIES PROJECTS BY YEAR

Appendix Table B-1. The Economic Impacts of Chapter-Specific Community and Rec Facilities Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	19	\$883,304	\$1,108,374	\$202,843	\$2,194,521
Indirect	2	\$87,975	\$163,776	\$57,540	\$309,291
Induced	4	\$157,305	\$203,288	\$134,951	\$495,544
Total	25	\$1,128,584	\$1,475,437	\$395,335	\$2,999,356
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	130	\$6,168,250	\$7,739,950	\$1,416,488	\$15,324,688
Indirect	12	\$614,343	\$1,143,674	\$401,814	\$2,159,830
Induced	25	\$1,098,488	\$1,419,589	\$942,384	\$3,460,460
Total	167	\$7,881,080	\$10,303,212	\$2,760,686	\$20,944,978
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	187	\$8,877,607	\$11,139,664	\$2,038,669	\$22,055,941
Indirect	18	\$884,188	\$1,646,023	\$578,308	\$3,108,519
Induced	35	\$1,580,990	\$2,043,133	\$1,356,319	\$4,980,441
Total	240	\$11,342,785	\$14,828,820	\$3,973,296	\$30,144,901
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	241	\$11,423,375	\$14,334,105	\$2,623,284	\$28,380,764
Indirect	23	\$1,137,740	\$2,118,042	\$744,145	\$3,999,927
Induced	46	\$2,034,359	\$2,629,027	\$1,745,261	\$6,408,647
Total	310	\$14,595,473	\$19,081,174	\$5,112,690	\$38,789,337
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	214	\$10,174,255	\$12,766,704	\$2,336,434	\$25,277,392
Indirect	20	\$1,013,331	\$1,886,439	\$662,774	\$3,562,544
Induced	41	\$1,811,906	\$2,341,549	\$1,554,420	\$5,707,876

Total	275	\$12,999,492	\$16,994,692	\$4,553,629	\$34,547,812
2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	193	\$9,160,965	\$11,495,223	\$2,103,740	\$22,759,928
Indirect	18	\$912,410	\$1,698,562	\$596,766	\$3,207,738
Induced	36	\$1,631,452	\$2,108,346	\$1,399,610	\$5,139,409
Total	247	\$11,704,827	\$15,302,131	\$4,100,117	\$31,107,075
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	89	\$4,229,103	\$5,306,698	\$971,179	\$10,506,979
Indirect	8	\$421,208	\$784,130	\$275,493	\$1,480,832
Induced	17	\$753,150	\$973,305	\$646,121	\$2,372,576
Total	114	\$5,403,461	\$7,064,134	\$1,892,793	\$14,360,388

IMPACT OF CHAPTER-SPECIFIC EDUCATION PROJECTS BY YEAR

Appendix Table B-2. The Economic Impacts of Chapter-Specific Education Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	31	\$1,623,417	\$1,636,457	\$741,434	\$4,001,307
Indirect	3	\$141,363	\$265,722	\$95,413	\$502,497
Induced	6	\$284,334	\$367,443	\$244,081	\$895,858
Total	40	\$2,049,114	\$2,269,622	\$1,080,927	\$5,399,663
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	215	\$11,336,574	\$11,427,638	\$5,177,547	\$27,941,760
Indirect	20	\$987,159	\$1,855,578	\$666,282	\$3,509,019
Induced	44	\$1,985,551	\$2,565,913	\$1,704,454	\$6,255,918
Total	279	\$14,309,283	\$15,849,129	\$7,548,284	\$37,706,696
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	310	\$16,316,078	\$16,447,142	\$7,451,746	\$40,214,966

Indirect	29	\$1,420,760	\$2,670,626	\$958,942	\$5,050,328
Induced	64	\$2,857,689	\$3,692,972	\$2,453,123	\$9,003,783
Total	403	\$20,594,528	\$22,810,740	\$10,863,810	\$54,269,077
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	398	\$20,994,923	\$21,163,571	\$9,588,629	\$51,747,124
Indirect	37	\$1,828,182	\$3,436,462	\$1,233,931	\$6,498,575
Induced	82	\$3,677,167	\$4,751,979	\$3,156,587	\$11,585,733
Total	517	\$26,500,272	\$29,352,012	\$13,979,147	\$69,831,431
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	355	\$18,699,176	\$18,849,383	\$8,540,135	\$46,088,694
Indirect	33	\$1,628,274	\$3,060,693	\$1,099,003	\$5,787,971
Induced	73	\$3,275,078	\$4,232,361	\$2,811,421	\$10,318,859
Total	461	\$23,602,528	\$26,142,436	\$12,450,559	\$62,195,524
2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	319	\$16,836,860	\$16,972,108	\$7,689,593	\$41,498,561
Indirect	30	\$1,466,109	\$2,755,868	\$989,550	\$5,211,526
Induced	66	\$2,948,901	\$3,810,845	\$2,531,422	\$9,291,168
Total	415	\$21,251,870	\$23,538,820	\$11,210,565	\$56,001,256
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	147	\$7,772,632	\$7,835,068	\$3,549,853	\$19,157,552
Indirect	14	\$676,820	\$1,272,229	\$456,819	\$2,405,869
Induced	30	\$1,361,342	\$1,759,253	\$1,168,615	\$4,289,210
Total	191	\$9,810,793	\$10,866,550	\$5,175,287	\$25,852,631

IMPACT OF CHAPTER-SPECIFIC NEW SCATTERED HOUSING PROJECTS BY YEAR

Appendix Table B-3. The Economic Impacts of Chapter-Specific New Scattered Housing Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	108	\$5,257,637	\$6,773,975	\$2,054,253	\$14,085,866
Indirect	24	\$1,059,775	\$1,490,231	\$820,046	\$3,370,052
Induced	23	\$1,025,136	\$1,324,795	\$879,471	\$3,229,402
Total	155	\$7,342,548	\$9,589,002	\$3,753,770	\$20,685,320
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	753	\$36,714,913	\$47,303,738	\$14,345,175	\$98,363,827
Indirect	168	\$7,400,576	\$10,406,519	\$5,726,513	\$23,533,608
Induced	160	\$7,158,687	\$9,251,255	\$6,141,482	\$22,551,425
Total	1,081	\$51,274,176	\$66,961,513	\$26,213,171	\$144,448,860
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,084	\$52,841,661	\$68,081,547	\$20,646,185	\$141,569,392
Indirect	242	\$10,651,223	\$14,977,504	\$8,241,841	\$33,870,568
Induced	230	\$10,303,086	\$13,314,799	\$8,839,082	\$32,456,967
Total	1,556	\$73,795,969	\$96,373,850	\$37,727,108	\$207,896,927
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,395	\$67,994,684	\$87,604,803	\$26,566,743	\$182,166,229
Indirect	311	\$13,705,597	\$19,272,495	\$10,605,295	\$43,583,387
Induced	297	\$13,257,627	\$17,132,989	\$11,373,802	\$41,764,418
Total	2,003	\$94,957,908	\$124,010,286	\$48,545,839	\$267,514,034
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,242	\$60,559,621	\$78,025,418	\$23,661,730	\$162,246,770
Indirect	277	\$12,206,921	\$17,165,092	\$9,445,630	\$38,817,643
Induced	264	\$11,807,936	\$15,259,536	\$10,130,103	\$37,197,575
Total	1,783	\$84,574,479	\$110,450,046	\$43,237,463	\$238,261,988

2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,118	\$54,528,277	\$70,254,595	\$21,305,176	\$146,088,048
Indirect	249	\$10,991,192	\$15,455,561	\$8,504,907	\$34,951,659
Induced	238	\$10,631,943	\$13,739,785	\$9,121,211	\$33,492,938
Total	1,605	\$76,151,411	\$99,449,940	\$38,931,293	\$214,532,645
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	516	\$25,172,639	\$32,432,595	\$9,835,402	\$67,440,636
Indirect	115	\$5,074,015	\$7,134,963	\$3,926,237	\$16,135,215
Induced	110	\$4,908,170	\$6,342,886	\$4,210,750	\$15,461,806
Total	741	\$35,154,824	\$45,910,444	\$17,972,389	\$99,037,657

IMPACT OF CHAPTER-SPECIFIC NEW MULTIFAMILY HOUSING PROJECTS BY YEAR

Appendix Table B-4. The Economic Impacts of Chapter-Specific New Multifamily Housing Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	121	\$5,899,095	\$3,042,781	\$2,592,545	\$11,534,421
Indirect	11	\$508,446	\$741,618	\$370,981	\$1,621,045
Induced	23	\$1,038,264	\$1,341,763	\$890,683	\$3,270,710
Total	155	\$7,445,805	\$5,126,162	\$3,854,210	\$16,426,176
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	843	\$41,194,308	\$21,248,220	\$18,104,152	\$80,546,680
Indirect	80	\$3,550,560	\$5,178,834	\$2,590,620	\$11,320,014
Induced	162	\$7,250,362	\$9,369,741	\$6,219,782	\$22,839,885
Total	1,085	\$51,995,230	\$35,796,794	\$26,914,555	\$114,706,579
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,213	\$59,288,596	\$30,581,339	\$26,056,264	\$115,926,200

Indirect	115	\$5,110,116	\$7,453,598	\$3,728,531	\$16,292,245
Induced	233	\$10,435,028	\$13,485,329	\$8,951,774	\$32,872,131
Total	1,561	\$74,833,741	\$51,520,265	\$38,736,569	\$165,090,576
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,561	\$76,290,361	\$39,350,930	\$33,528,232	\$149,169,522
Indirect	148	\$6,575,508	\$9,591,012	\$4,797,735	\$20,964,255
Induced	300	\$13,427,407	\$17,352,419	\$11,518,810	\$42,298,636
Total	2,009	\$96,293,275	\$66,294,361	\$49,844,777	\$212,432,413
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,390	\$67,948,185	\$35,047,996	\$29,861,996	\$132,858,177
Indirect	132	\$5,856,491	\$8,542,257	\$4,273,114	\$18,671,861
Induced	268	\$11,959,150	\$15,454,972	\$10,259,255	\$37,673,377
Total	1,790	\$85,763,826	\$59,045,225	\$44,394,365	\$189,203,416
2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,252	\$61,180,989	\$31,557,444	\$26,887,936	\$119,626,369
Indirect	119	\$5,273,223	\$7,691,504	\$3,847,539	\$16,812,266
Induced	241	\$10,768,097	\$13,915,757	\$9,237,500	\$33,921,354
Total	1,612	\$77,222,308	\$53,164,705	\$39,972,975	\$170,359,989
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	578	\$28,243,821	\$14,568,297	\$12,412,648	\$55,224,766
Indirect	55	\$2,434,350	\$3,550,735	\$1,776,192	\$7,761,277
Induced	111	\$4,971,025	\$6,424,123	\$4,264,434	\$15,659,581
Total	744	\$35,649,196	\$24,543,154	\$18,453,274	\$78,645,625

IMPACT OF CHAPTER-SPECIFIC HOUSING REPAIR PROJECTS BY YEAR

Appendix Table B-5. The Economic Impacts of Chapter-Specific Housing Repair Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	13	\$633,063	\$1,696,139	\$418,744	\$2,747,945
Indirect	6	\$261,745	\$368,906	\$213,482	\$844,132
Induced	3	\$145,423	\$187,931	\$124,775	\$458,128
Total	22	\$1,040,230	\$2,252,976	\$757,000	\$4,050,206
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	93	\$4,420,778	\$11,844,410	\$2,924,153	\$19,189,341
Indirect	41	\$1,827,804	\$2,576,132	\$1,490,776	\$5,894,712
Induced	23	\$1,015,509	\$1,312,350	\$871,323	\$3,199,181
Total	157	\$7,264,091	\$15,732,892	\$5,286,252	\$28,283,234
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	134	\$6,362,571	\$17,046,976	\$4,208,565	\$27,618,113
Indirect	60	\$2,630,653	\$3,707,679	\$2,145,588	\$8,483,919
Induced	33	\$1,461,563	\$1,888,789	\$1,254,045	\$4,604,397
Total	227	\$10,454,787	\$22,643,444	\$7,608,198	\$40,706,429
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	173	\$8,187,120	\$21,935,415	\$5,415,426	\$35,537,961
Indirect	77	\$3,385,026	\$4,770,903	\$2,760,862	\$10,916,791
Induced	42	\$1,880,685	\$2,430,424	\$1,613,658	\$5,924,767
Total	292	\$13,452,831	\$29,136,742	\$9,789,946	\$52,379,519
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	154	\$7,291,877	\$19,536,828	\$4,823,261	\$31,651,966
Indirect	68	\$3,014,881	\$4,249,216	\$2,458,968	\$9,723,065
Induced	37	\$1,675,036	\$2,164,663	\$1,437,208	\$5,276,908
Total	259	\$11,981,795	\$25,950,706	\$8,719,438	\$46,651,938

2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	139	\$6,565,654	\$17,591,087	\$4,342,896	\$28,499,636
Indirect	61	\$2,714,618	\$3,826,021	\$2,214,071	\$8,754,711
Induced	34	\$1,508,214	\$1,949,076	\$1,294,072	\$4,751,362
Total	234	\$10,788,486	\$23,366,184	\$7,851,039	\$42,005,709
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	64	\$3,030,993	\$8,120,816	\$2,004,871	\$13,156,679
Indirect	28	\$1,253,187	\$1,766,259	\$1,022,112	\$4,041,558
Induced	16	\$696,257	\$899,779	\$597,400	\$2,193,437
Total	108	\$4,980,437	\$10,786,853	\$3,624,383	\$19,391,674

IMPACT OF CHAPTER-SPECIFIC HEALTH PROJECTS BY YEAR

Appendix Table B-6. The Economic Impacts of Chapter-Specific Health Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	22	\$1,143,416	\$1,441,155	\$626,808	\$3,211,380
Indirect	3	\$123,542	\$223,472	\$80,072	\$427,085
Induced	5	\$204,986	\$264,905	\$175,883	\$645,774
Total	30	\$1,471,945	\$1,929,533	\$882,763	\$4,284,240
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	154	\$7,984,656	\$10,063,814	\$4,377,102	\$22,425,572
Indirect	18	\$862,713	\$1,560,539	\$559,152	\$2,982,405
Induced	32	\$1,431,451	\$1,849,876	\$1,228,215	\$4,509,542
Total	204	\$10,278,821	\$13,474,229	\$6,164,469	\$29,917,519
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	222	\$11,491,856	\$14,484,268	\$6,299,710	\$32,275,834

Indirect	25	\$1,241,654	\$2,245,994	\$804,755	\$4,292,403
Induced	46	\$2,060,205	\$2,662,419	\$1,767,699	\$6,490,324
Total	293	\$14,793,715	\$19,392,681	\$8,872,165	\$43,058,561
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	286	\$14,787,293	\$18,637,818	\$8,106,233	\$41,531,343
Indirect	33	\$1,597,714	\$2,890,062	\$1,035,529	\$5,523,305
Induced	59	\$2,650,996	\$3,425,902	\$2,274,610	\$8,351,508
Total	378	\$19,036,002	\$24,953,782	\$11,416,372	\$55,406,156
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	254	\$13,170,336	\$16,599,815	\$7,219,835	\$36,989,986
Indirect	29	\$1,423,007	\$2,574,040	\$922,297	\$4,919,344
Induced	53	\$2,361,115	\$3,051,288	\$2,025,886	\$7,438,289
Total	336	\$16,954,459	\$22,225,143	\$10,168,018	\$49,347,620
2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	229	\$11,858,656	\$14,946,582	\$6,500,786	\$33,306,024
Indirect	26	\$1,281,285	\$2,317,682	\$830,442	\$4,429,409
Induced	48	\$2,125,964	\$2,747,399	\$1,824,121	\$6,697,484
Total	303	\$15,265,905	\$20,011,663	\$9,155,349	\$44,432,918
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	106	\$5,474,475	\$6,899,996	\$3,001,048	\$15,375,519
Indirect	12	\$591,497	\$1,069,944	\$383,368	\$2,044,809
Induced	22	\$981,438	\$1,268,320	\$842,094	\$3,091,852
Total	140	\$7,047,410	\$9,238,260	\$4,226,510	\$20,512,180

IMPACT OF CHAPTER-SPECIFIC INFRASTRUCTURE PROJECTS BY YEAR

Appendix Table B-7. The Economic Impacts of Chapter-Specific Infrastructure Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	131	\$6,507,868	\$6,349,133	(\$1,878,291)	\$10,978,710
Indirect	13	\$655,286	\$1,085,721	\$456,782	\$2,197,789
Induced	26	\$1,158,778	\$1,497,498	\$994,262	\$3,650,538
Total	170	\$8,321,933	\$8,932,352	(\$427,247)	\$16,827,038
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	915	\$45,445,471	\$44,337,001	(\$13,116,404)	\$76,666,068
Indirect	94	\$4,575,969	\$7,581,760	\$3,189,782	\$15,347,511
Induced	181	\$8,091,931	\$10,457,263	\$6,943,091	\$25,492,285
Total	1,190	\$58,113,371	\$62,376,025	(\$2,983,531)	\$117,505,865
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,317	\$65,407,051	\$63,811,693	(\$18,877,685)	\$110,341,059
Indirect	135	\$6,585,928	\$10,911,991	\$4,590,869	\$22,088,789
Induced	260	\$11,646,250	\$15,050,537	\$9,992,791	\$36,689,579
Total	1,712	\$83,639,229	\$89,774,221	(\$4,294,024)	\$169,119,426
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,695	\$84,163,361	\$82,110,513	(\$24,291,103)	\$141,982,771
Indirect	174	\$8,474,528	\$14,041,145	\$5,907,360	\$28,423,032
Induced	335	\$14,985,962	\$19,366,472	\$12,858,352	\$47,210,786
Total	2,204	\$107,623,850	\$115,518,129	(\$5,525,391)	\$217,616,589
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,510	\$74,960,290	\$73,131,917	(\$21,634,927)	\$126,457,281
Indirect	155	\$7,547,857	\$12,505,778	\$5,261,404	\$25,315,039
Induced	299	\$13,347,281	\$17,248,792	\$11,452,321	\$42,048,395
Total	1,964	\$95,855,429	\$102,886,487	(\$4,921,202)	\$193,820,714

2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	1,359	\$67,494,734	\$65,848,454	(\$19,480,229)	\$113,862,959
Indirect	140	\$6,796,140	\$11,260,284	\$4,737,402	\$22,793,826
Induced	269	\$12,017,979	\$15,530,925	\$10,311,744	\$37,860,648
Total	1,768	\$86,308,852	\$92,639,663	(\$4,431,082)	\$174,517,433
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	628	\$31,158,523	\$30,398,528	(\$8,992,926)	\$52,564,125
Indirect	64	\$3,137,396	\$5,198,240	\$2,186,992	\$10,522,627
Induced	124	\$5,548,025	\$7,169,755	\$4,760,353	\$17,478,132
Total	816	\$39,843,943	\$42,766,522	(\$2,045,582)	\$80,564,884

IMPACT OF CHAPTER-SPECIFIC PUBLIC SAFETY PROJECTS BY YEAR

Appendix Table B-8. The Economic Impacts of Chapter-Specific New Public Safety Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	10	\$463,547	\$581,662	\$106,450	\$1,151,659
Indirect	1	\$46,168	\$85,948	\$30,197	\$162,312
Induced	2	\$82,552	\$106,683	\$70,821	\$260,056
Total	13	\$592,268	\$774,292	\$207,467	\$1,574,027
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	68	\$3,237,025	\$4,061,835	\$743,356	\$8,042,216
Indirect	6	\$322,400	\$600,186	\$210,867	\$1,133,453
Induced	13	\$576,473	\$744,984	\$494,552	\$1,816,009
Total	87	\$4,135,898	\$5,407,005	\$1,448,775	\$10,991,678
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	98	\$4,658,864	\$5,845,964	\$1,069,870	\$11,574,698
Indirect	9	\$464,011	\$863,814	\$303,489	\$1,631,314

Induced	19	\$829,685	\$1,072,212	\$711,780	\$2,613,677
Total	126	\$5,952,560	\$7,781,990	\$2,085,139	\$15,819,689
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	126	\$5,994,852	\$7,522,369	\$1,376,668	\$14,893,890
Indirect	12	\$597,073	\$1,111,523	\$390,518	\$2,099,114
Induced	24	\$1,067,608	\$1,379,682	\$915,892	\$3,363,182
Total	162	\$7,659,532	\$10,013,575	\$2,683,079	\$20,356,186
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	112	\$5,339,329	\$6,699,815	\$1,226,133	\$13,265,277
Indirect	11	\$531,784	\$989,981	\$347,816	\$1,869,581
Induced	21	\$950,867	\$1,228,817	\$815,741	\$2,995,426
Total	144	\$6,821,980	\$8,918,613	\$2,389,691	\$18,130,284
2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	101	\$4,807,567	\$6,032,558	\$1,104,018	\$11,944,142
Indirect	10	\$478,822	\$891,385	\$313,176	\$1,683,383
Induced	19	\$856,167	\$1,106,435	\$734,499	\$2,697,101
Total	130	\$6,142,555	\$8,030,378	\$2,151,693	\$16,324,626
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	47	\$2,219,383	\$2,784,893	\$509,663	\$5,513,939
Indirect	4	\$221,045	\$411,502	\$144,576	\$777,123
Induced	9	\$395,244	\$510,779	\$339,077	\$1,245,100
Total	60	\$2,835,672	\$3,707,174	\$993,316	\$7,536,162

IMPACT OF CHAPTER-SPECIFIC TRANSPORTATION PROJECTS BY YEAR

Appendix Table B-9. The Economic Impacts of Chapter-Specific Transportation Projects by Year

2021	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	20	\$978,446	\$1,166,211	(\$191,986)	\$1,952,671
Indirect	4	\$181,870	\$253,125	\$139,539	\$574,534
Induced	4	\$188,150	\$243,149	\$161,417	\$592,716
Total	28	\$1,348,466	\$1,662,484	\$108,970	\$3,119,921
2022	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	139	\$6,832,643	\$8,143,837	(\$1,340,666)	\$13,635,814
Indirect	29	\$1,270,028	\$1,767,610	\$974,421	\$4,012,059
Induced	29	\$1,313,883	\$1,697,946	\$1,127,203	\$4,139,031
Total	197	\$9,416,554	\$11,609,392	\$760,958	\$21,786,904
2023	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	201	\$9,833,830	\$11,720,955	(\$1,929,544)	\$19,625,242
Indirect	42	\$1,827,878	\$2,544,019	\$1,402,428	\$5,774,325
Induced	42	\$1,890,996	\$2,443,755	\$1,622,319	\$5,957,070
Total	285	\$13,552,704	\$16,708,730	\$1,095,203	\$31,356,637
2024	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	258	\$12,653,807	\$15,082,090	(\$2,482,865)	\$25,253,031
Indirect	54	\$2,352,046	\$3,273,549	\$1,804,593	\$7,430,187
Induced	54	\$2,433,263	\$3,144,534	\$2,087,539	\$7,665,336
Total	366	\$17,439,116	\$21,500,172	\$1,409,267	\$40,348,555
2025	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	230	\$11,270,142	\$13,432,898	(\$2,211,369)	\$22,491,671
Indirect	48	\$2,094,855	\$2,915,594	\$1,607,265	\$6,617,714
Induced	48	\$2,167,191	\$2,800,686	\$1,859,272	\$6,827,149
Total	326	\$15,532,189	\$19,149,178	\$1,255,167	\$35,936,534

2026	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	207	\$10,147,709	\$12,095,069	(\$1,991,131)	\$20,251,646
Indirect	43	\$1,886,221	\$2,625,220	\$1,447,191	\$5,958,632
Induced	44	\$1,951,353	\$2,521,756	\$1,674,100	\$6,147,209
Total	294	\$13,985,283	\$17,242,044	\$1,130,160	\$32,357,488
2027	Annual	Labor	Intermediate	Taxes/	Total
Type	Jobs	Income	Expenses	Profits	Output
Direct	96	\$4,684,627	\$5,583,613	(\$919,193)	\$9,349,047
Indirect	20	\$870,762	\$1,211,916	\$668,087	\$2,750,766
Induced	20	\$900,830	\$1,164,153	\$772,838	\$2,837,821
Total	136	\$6,456,219	\$7,959,683	\$521,731	\$14,937,634

Appendix C – Water Supplement Analysis

1. Navajo Thaw Regional Recovery Plan (2020) Water Projects

1.1 Executive Summary

The purpose of this supplemental analysis is to determine the amount of funding allocated for water-related projects, including agriculture, within the Former Bennett Freeze Area (FBFA) as identified in the [Navajo Thaw Regional Recovery Plan](#) (Building Communities, Inc. and Native Builders, LLC 2020). The economic impacts that could result from the implementation of these projects are estimated.

Two pipelines account for most of the total amount budgeted for water projects. The Western Navajo Pipeline and the C-aquifer Leupp to Dilkon Pipeline are the two Regional Projects for water development, and their combined capital budget is \$582 million. The 2020 Recovery Plan shows a total implementation budget of \$3.6 billion, including the \$582 million. The 2020 Recovery Plan also describes what appear to be subsets of these projects with lesser budget amounts. This analysis estimates the economic impacts that would result from spending the entire \$582 million.

The Chapter-specific projects within each Chapter are primarily residential and would improve water service to 4,017 houses within the FBFA at the cost of \$79 million. Another \$22.5 million is budgeted for seven Infrastructure Capital Improvement Plan water projects, primarily water and sewer lines.

Within the Immediate Recovery category, the Little Colorado River Valley Farms Project accounts for most water development within that category. The total budget for Immediate Recovery water projects is \$76 million.

The total direct investment for the various water projects within the 2020 Recovery Plan is \$760 million, and the resulting total economic impact is almost \$1.2 billion. This economic activity would create a total of 11,600 one-year jobs.

Table 1-1. Economic Impacts by Project Category

Economic Impacts by Project Category					
Total Economic Impact of Nine Chapter-Specific Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	740	\$36,398,510	\$46,699,524	(\$4,265,611)	\$78,832,423
Indirect	122	\$5,719,126	\$8,803,889	\$4,308,524	\$18,831,538
Induced	152	\$6,820,291	\$8,813,915	\$5,851,975	\$21,486,181
Total	1,014	\$48,937,927	\$64,317,327	\$5,894,888	\$119,150,143
Total Economic Impact of the Regional Chapter-Specific Water Projects					
Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	6,955	\$345,306,346	\$336,883,901	(\$99,661,801)	\$582,528,447
Indirect	714	\$34,769,383	\$57,608,160	\$24,236,780	\$116,614,323
Induced	1,375	\$61,484,566	\$79,456,969	\$52,755,387	\$193,696,922
Total	9,044	\$441,560,295	\$473,949,030	(\$22,669,634)	\$892,839,692

Economic Impacts by Project Category					
Total Economic Impact of Infrastructure Capital Improvement Plan Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	268	\$13,282,720	\$13,017,013	(\$3,799,830)	\$22,499,902
Indirect	28	\$1,346,041	\$2,228,993	\$939,050	\$4,514,083
Induced	53	\$2,366,526	\$3,058,280	\$2,030,542	\$7,455,348
Total	348	\$16,995,287	\$18,304,286	(\$830,239)	\$34,469,334
Total Economic Impact of Immediate Recovery Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	968	\$34,428,732	\$40,985,001	\$917,070	\$76,330,803
Indirect	94	\$4,382,037	\$7,645,570	\$3,009,509	\$15,037,116
Induced	141	\$6,295,678	\$8,135,971	\$5,401,338	\$19,832,988
Total	1,202	\$45,106,446	\$56,766,542	\$9,327,918	\$111,200,906
Grand Total Economic Impact of All Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	8,931	\$429,416,307	\$437,585,439	(\$106,810,171)	\$760,191,575
Indirect	958	\$46,216,586	\$76,286,612	\$32,493,862	\$154,997,061
Induced	1,721	\$76,967,062	\$99,465,134	\$66,039,243	\$242,471,439
Total	11,608	\$552,599,955	\$613,337,185	(\$8,277,066)	\$1,157,660,074

1.2 Background and Approach

The importance of water is referenced throughout the [Navajo Thaw Regional Recovery Plan](#) (2020), from the lack of running water to wash hands to the need for large-scale infrastructure development. This report identifies the many water resource projects appearing in the 2020 Recovery Plan and traces project details to their originating documents.

Many water projects first appear in the 2008 Recovery Plan and the associated Chapter Land Use Plans (CLUPs) in the form of “Power, Water, and Access to Existing Scattered Housing.” The capital budgets for these projects overestimate providing water by combining power and access costs. However, the 2008 Recovery Plan does provide a cost range for providing water and wastewater services to scattered houses of \$20,000 to \$30,000 “based on historical information and data from other studies.” Remember that these are 2010 dollars.

The capital budgets also identify the number of houses to be served by the project. According to the 2008 Recovery Plan, these capital budgets are based on a level of population growth and 2020 housing demand estimated that was projected in 2008. At that time, the population of the FBFA was estimated to grow to 9,056 by 2020. As we now know, the actual population growth fell short of the 2008 projections. The existing 2020 FBFA population is estimated at 6,872.

Researching and updating the actual number of houses needing water improvements based on the current population, revised population projections, and current housing inventory is beyond this analysis's scope. The Navajo Thaw Regional Recovery Plan (2020) draws from the 2008 Recovery Plan budgets and acknowledges the need to update the 2008 Recovery Plan projects and their associated budgets but does not do this at the project-specific budget level.

This analysis models the economic impacts of all the water-specific project budgets referenced in the Navajo Thaw Regional Recovery Plan (2020) using the IMPLAN software system. All the results are shown in 2021 dollars.

The 2008 Recovery Plan includes several sections on livestock water; however, the focus is that many of these water sources are not safe for human or livestock consumption. Somewhat more detailed descriptions of the current water systems and utilities are provided in each Chapter's 2008 CLUPs. For the most part, the Chapter-specific and Infrastructure Capital Improvement Projects appear to be residential in nature as water lines, sewer lines, and in many cases identifying the number of houses served. Presumably, the pipeline and aquifer projects will serve both residential and agricultural needs.

For the Chapter-specific projects, there are three tables presented for each Chapter and Regional projects. The first lists the project line items shown in the 2008 Recovery Plan. The second and third show the economic and tax revenue impacts, respectively. For the Infrastructure Capital Improvement projects, one table is presented at the beginning of the section showing the seven projects' capital budget. For each Chapter, the economic and tax revenue impacts are presented. For the Immediate Recovery projects, the project budget and economic effects are presented with combined total financial and tax revenue impacts. Available descriptions have been excerpted and are presented.

The Indian Health Service maintains the Sanitation Deficiency System (SDS) database of unfunded, priority water and wastewater projects throughout the Navajo Nation. The SDS project list is shown on page 97 of the 2020 Recovery Plan. It is not clear whether these projects are included within the other budgets considered in this analysis. This analysis assumes they are included, and therefore they are not shown as additional projects.

2. Regional and Chapter-Specific Water Projects

The 2020 Recovery Plan lists Regional Projects totaling \$447 million and Chapter-specific Projects totaling \$4.3 billion for a combined total of \$4.74 billion (2010 dollars). The 2020 Recovery Plan cites the 2008 Recovery Plan as the source of these budgets. Specifically, the CLUPs appearing in Appendix 7.5 of the 2008 Recovery Plan provide a modest level of detail and description for each project. Further, Appendix 7.12 in the 2008 Recovery Plan organizes project lists by Chapter and includes a separate section for Regional projects.

The Regional and Chapter-specific capital budgets in the 2008 Recovery Plan list 33 projects involving water and water system development and improvements. Thirty-one of these projects connect to homes within each of the nine Chapters, and two of the projects are substantial infrastructure projects. Project descriptions show a total of 4,986 homes are to have water systems connected and/or upgraded.

Twenty-six of these home projects are within the FBFA or a total of 4,017 homes for a combined budget of \$78 million. Infrastructure project budgets do not identify the percent of projects within the FBFA and all of those have been assumed to be 100 percent within the FBFA.

2.1 Chapter-Specific Water Project Categories

Water service in the FBFA is poor. The 2008 Recovery Plan found:

Based on limited field data and comparison with other reports, approximately 30 percent of FBFA residents haul water. Some FBFA residents are as many as 24 miles away from a regulated watering point with safe drinking water. Often these residents resort to drinking the same water as their livestock from nearby windmills – water untested for water quality and exposed to bacteria from livestock, vandalism, and, in some cases, uranium contamination.

There are three types of water projects within the list of Chapter-specific projects falling under either the Housing or Infrastructure categories, as shown below.

- Housing
 - Power, water, and access to existing scattered housing
- Infrastructure
 - Unfunded water, wastewater projects
 - Active and inactive water and wastewater projects

Beyond identifying the number of houses served by each project budget, the 2008 Recovery Plan offers few details on each project's nature. Concentrated development, improved tanks at windmills, and better storage for scattered houses not connected to public water systems are frequently cited water supply needs.

Economic impacts are modeled using IMPLAN software. Many water and wastewater projects are modeled using Sector 56 data (Construction of other new nonresidential structures). In 2018, the most recent IMPLAN data year available, this sector in Coconino County ran a deficit, and as a result, the direct taxes/profit result is a loss. Overall, Coconino County employed 554 people in 2018, producing a total output of \$44 million, and yet Other Property Income was (\$7,992,808.91).

2.2 Chapter-Specific Studies

In addition to budgeted capital projects, the 2008 Recovery Plan recommended two studies on water. The Livestock Water Provision Study description includes the topics of irrigation, windmills, earthen dams, tanks, water for livestock.

Table 2-1. Recommended Water Studies in the Recovery Plan

Study	Year	Budget
Water and Land	2010	\$500,000
Livestock / Agricultural Water Provision Study & Plan	2010	\$500,000
Total		\$1,000,000

2.3 Chapter-Specific Water Project Impacts by Chapter

This section models the economic impacts arising from the implementation of water-related Chapter-specific projects. Capital budget estimates are used as IMPLAN inputs to model direct, indirect, and induced impacts. Tax impacts are also provided. In addition to economic impacts, unique information pertaining to each Chapter's water needs is included as excerpts from the 2008 and 2020 Chapter CLUPs.

Table 2-2. Chapter-Specific Water Project Budgets

Chapter	# houses	# houses in FBFA	Budget	Budget in FBFA
Bodaway Gap	604	592	\$18,458,218	\$16,863,106
Cameron	496	496	\$18,811,872	\$18,811,872
Coalmine Canyon	451	451	\$4,480,946	\$4,480,946
Coppermine	38	11	\$4,836,167	\$1,399,943
Kaibeto	487	370	\$28,178,249	\$12,153,488
Leupp	126	1	\$16,030,999	\$127,230
Tolani Lake	43	13	\$5,472,505	\$1,654,478
Tonalea	651	517	\$29,963,412	\$11,891,825
Tuba City	2,090	1,566	\$80,014,578	\$11,449,534
Chapter Subtotal	4,986	4,017	\$206,246,947	\$78,832,423
Regional	0	0	\$582,528,447	\$582,528,447
Chapter-specific Total	4,986	4,017	\$788,775,394	\$661,360,870

2.3.1 Bodaway Gap Chapter-Specific Water Projects

Table 2-3 below shows 604 homes in the Chapter are estimated to need residential water improvements in 2020, of which 592 are in the FBFA. Table 2-4 shows the economic impact of constructing these improvements with a total capital budget of \$16,863,106. Table 2-5 shows the tax impacts.

Table 2-3. Bodaway Gap Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrades 12	12	0%	\$1,595,112	\$0
Power and water upgrades 57	57	100%	\$7,576,781	\$7,576,781
Active and inactive water/wastewater 134	134	100%	\$5,381,640	\$5,381,640
Unfunded water/wastewater 401	401	100%	\$3,904,685	\$3,904,685
Total	604		\$18,458,218	\$16,863,106

Table 2-4. Bodaway Gap Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	150	\$7,367,068	\$10,034,535	(\$538,496)	\$16,863,106
Indirect	27	\$1,264,498	\$1,924,121	\$963,354	\$4,151,973
Induced	31	\$1,398,091	\$1,806,764	\$1,199,595	\$4,404,451
Total	209	\$10,029,658	\$13,765,419	\$1,624,453	\$25,419,530

Table 2-5. Bodaway Gap Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$47,644	\$71,655	\$36,534	\$233,923	\$1,280,455	\$1,670,211
Indirect	\$70,873	\$104,816	\$54,133	\$217,428	\$268,063	\$715,313
Induced	\$44,547	\$65,993	\$34,039	\$146,959	\$292,634	\$584,172
Total	\$163,064	\$242,464	\$124,706	\$598,310	\$1,841,151	\$2,969,695

2.3.1.1 Except from 2008 Bodaway Gap CLUP

Extended waterlines are needed to better serve the communities and future development areas within the Chapter. The Cedar Ridge Community needs to have municipal water service because the existing water wells are inadequate and provide poor water quality.

2.3.1.2 Excerpts from Bodaway Gap 2020 CLUP

Overview of Western Navajo Pipeline Project

The Bodaway Gap Chapter officials and Steering Committee understand that the Western Navajo Pipeline project is intended to draw water from Lake Powell in Page to pipe the water south to many Navajo Chapters. There was some discussion at the Bodaway Gap Steering Committee that there is a desire to run the waterline to Coppermine and then to First Windmill and then over to Cedar Ridge before it comes down to the Gap. This would provide water for people and livestock at Cedar Ridge. Water to Cedar Ridge could then gravity flow to the fields below the community.

Drinking Water

People that live in portions of the Chapter away from US-89 do not have drinking water and must haul the water from the service station. Before 2 years ago, their drinking water source was the water system managed and operated by the Chapter itself. Unfortunately, that system has not been functioning due to problems with system electronics. Not only is this preventing the people from getting water from the Chapter, but the Chapter is losing water sale revenues. The water volume and quality are “good and plentiful,” it is just the system/mechanics that are broken. In addition, it is thought that the valve may be leaking. A cost estimate of \$28,000 was provided to fix the leak.

2.3.2 Cameron Chapter-Specific Water Projects

Table 2-6 below shows 496 homes in the Chapter are estimated to need residential water improvements in 2020, of which all 496 are in the FBFA. Table 2-7 shows the economic impact of constructing these improvements with a total capital budget of \$18,811,872. Table 2-8 shows the tax impacts.

Table 2-6. Cameron Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrades 41	41	100%	\$5,515,731	\$5,515,731
Active and inactive water/wastewater 88	88	100%	\$3,866,123	\$3,866,123
Unfunded water/wastewater 309	309	100%	\$5,524,351	\$5,524,351
Unfunded water/wastewater 58	58	100%	\$3,905,668	\$3,905,668
Total	496		\$18,811,872	\$18,811,872

Table 2-7. Cameron Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	188	\$9,260,179	\$11,082,268	(\$1,530,575)	\$18,811,872
Indirect	28	\$1,308,396	\$2,044,848	\$970,962	\$4,324,207
Induced	38	\$1,710,943	\$2,211,065	\$1,468,032	\$5,390,040
Total	254	\$12,279,518	\$15,338,181	\$908,419	\$28,526,119

Table 2-8. Cameron Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$46,005	\$69,585	\$35,326	\$252,632	\$1,588,876	\$1,992,424
Indirect	\$69,174	\$102,317	\$52,837	\$213,392	\$275,081	\$712,801
Induced	\$54,515	\$80,761	\$41,656	\$179,845	\$358,117	\$714,894
Total	\$169,695	\$252,663	\$129,818	\$645,868	\$2,222,075	\$3,420,119

2.3.2.1 Except from 2008 Cameron CLUP

Water infrastructure development is needed for commercial and domestic use. The Chapter needs to investigate acquiring water rights to the Colorado River and Little Colorado River to provide water to the community.

2.3.3 Coalmine Canyon Chapter-Specific Water Projects

Table 2-9 below shows 496 homes in the Chapter are estimated to need residential water improvements in 2020, of which all 496 are in the FBFA. Table 2-10 shows the economic impact of constructing these improvements with a total capital budget of \$18,811,872. Table 2-11 shows the tax impacts.

Table 2-9. Coalmine Canyon Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 80	80	100%	\$2,122,800	\$2,122,800
Active and inactive 108	108	100%	\$1,671,762	\$1,671,762
Unfunded 263	263	100%	\$686,384	\$686,384
Total	451		\$4,480,946	\$4,480,946

Table 2-10. Coalmine Canyon Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	39	\$1,918,240	\$2,670,654	(\$107,948)	\$4,480,946
Indirect	7	\$339,873	\$515,128	\$259,907	\$1,114,908
Induced	8	\$365,790	\$472,713	\$313,856	\$1,152,359
Total	55	\$2,623,902	\$3,658,495	\$465,815	\$6,748,213

Table 2-11. Coalmine Canyon Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$12,930	\$19,432	\$9,913	\$62,474	\$334,184	\$438,933
Indirect	\$19,206	\$28,404	\$14,670	\$58,878	\$72,136	\$193,296
Induced	\$11,655	\$17,266	\$8,906	\$38,450	\$76,563	\$152,840
Total	\$43,792	\$65,102	\$33,489	\$159,802	\$482,884	\$785,069

2.3.3.1 Excerpt from the 2008 Coalmine Canyon CLUP

Many scattered-site homes are not connected to municipal water systems due to their remoteness and cost and the inefficiency of extending these systems to isolated locations. At the same time, the Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Those homes located close to existing water systems should be hooked up. Those too far from existing systems should be retrofitted for plumbing and provided nearby watering points where safe water for drinking and domestic use can be collected and hauled.

As part of the FBFA Recovery Plan, a system of residential zones is being proposed to distinguish among those homes close enough to hook up to existing municipal water systems, those homes already near safe watering points, and those homes in remote locations that must haul water from long distances. Two major issues are facing those in remote homes. One is the cost, stress, and labor of hauling the water from far away to their homes—a particular burden for elderly residents living alone and their families who help care for them. Another is the risk that many people in these remote areas resort to using water from nearby windmills or earthen dams instead of traveling long distances to a safer water source. Water from windmills and earthen dams, intended for livestock use, is not tested for water quality and is at risk for airborne and bacterial contamination from contact with animals.

Improving access to safe domestic and drinking water and water for livestock and irrigation would rely on policy decisions about how best to provide water in remote locations. Providing more safe watering points is one approach; providing a regional water delivery system might be another. The technology exists to solve any number of problems once the community decides what problem to solve and what a successful solution will look like. Some solutions will be more costly or more efficient than others, but strong leadership and precise decision-making, starting at the Chapter level, will still be needed to set the parameters of what solutions the community demands.

The municipal water service needs new waterlines to replace the existing copper waterlines that have exceeded their useful life. The existing water service needs to extend beyond the current service area, and additional water storage tanks are needed to handle the additional demand.

2.3.3.2 Excerpt from the 2020 Coalmine Canyon CLUP

Large-scale Agriculture. There is interest at Coalmine Canyon to develop large-scale agriculture, drawing from area groundwater supplies.

2.3.4 Coppermine Chapter-Specific Water Projects

Table 2-12 below shows 38 homes in the Chapter are estimated to need residential water improvements in 2020, of which 11 are in the FBFA. Table 2-13 shows the economic impact of constructing these improvements with a total capital budget of \$1,399,943. Table 2-14 shows the tax impacts.

Table 2-12. Coppermine Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 11	11	100%	\$1,399,943	\$1,399,943
Power and water upgrade 27	27	0%	\$3,436,224	\$0
Total	38		\$4,836,167	\$1,399,943

Table 2-13. Coppermine Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	7	\$322,514	\$864,099	\$213,329	\$1,399,943
Indirect	3	\$133,346	\$187,940	\$108,758	\$430,044
Induced	2	\$74,086	\$95,741	\$63,567	\$233,394

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Total	12	\$529,946	\$1,147,781	\$385,654	\$2,063,381

Table 2-14. Coppermine Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$5,938	\$8,821	\$4,540	\$21,730	\$61,776	\$102,805
Indirect	\$8,628	\$12,756	\$6,590	\$26,143	\$28,903	\$83,020
Induced	\$2,361	\$3,497	\$1,804	\$7,787	\$15,507	\$30,955
Total	\$16,926	\$25,074	\$12,933	\$55,661	\$106,186	\$216,781

2.3.5 Kaibeto Chapter-Specific Water Projects

Table 2-15 below shows 487 homes in the Chapter are estimated to need residential water improvements in 2020, of which 370 are in the FBFA. Table 2-16 shows the economic impact of constructing these improvements with a total capital budget of \$12,153,488. Table 2-17 shows the tax impacts.

Table 2-15. Kaibeto Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 5	5	100%	\$684,819	\$684,819
Power and water upgrade 117	117	0%	\$16,024,761	\$0
Active and inactive 58	58	100%	\$2,390,089	\$2,390,089
Active and inactive 86	86	100%	\$4,384,290	\$4,384,290
Unfunded 185	185	100%	\$2,720,219	\$2,720,219
Unfunded 36	36	100%	\$1,974,071	\$1,974,071
Total	487		\$28,178,249	\$12,153,488

Table 2-16. Kaibeto Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	141	\$6,973,637	\$7,053,293	(\$1,873,442)	\$12,153,488
Indirect	15	\$748,036	\$1,224,396	\$528,620	\$2,501,052
Induced	28	\$1,249,285	\$1,614,460	\$1,071,919	\$3,935,663
Total	184	\$8,970,958	\$9,892,149	(\$272,903)	\$18,590,203

Table 2-17. Kaibeto Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$22,925	\$35,108	\$17,656	\$155,294	\$1,179,142	\$1,410,125

Type	Sub County	Special Districts	County	State	Federal	Total
Indirect	\$35,282	\$52,201	\$26,951	\$110,118	\$154,923	\$379,476
Induced	\$39,806	\$58,969	\$30,416	\$131,318	\$261,488	\$521,997
Total	\$98,013	\$146,279	\$75,023	\$396,731	\$1,595,553	\$2,311,599

2.3.5.1 Excerpts from 2020 Kaibeto CLUP

In addition to the Projects and Priorities already identified in the Kaibeto Chapter Recovery Plan, Chapter President Franklin Fowler identified the following Priorities on May 22, 2020. Second, a Watering Point needs to be developed between Gap and Kaibeto.

Water for Livestock

Most of the stock ponds and windmills need repair. The windmills generate the power to pump the water into the ponds for use by livestock. Sadly, the livestock pond tanks are often used for human water consumption and hygienic needs due to the tanks being open and uncovered. Also, BIA built cistern and hand pump systems have become inoperable due to decades of neglect.

Large-Scale Water Supply/Use for Agriculture

The Kaibeto Leadership believes it has an opportunity for large-scale agriculture if the area's groundwater supply could be harnessed. The agricultural activity would relate to food crops as well as livestock use.

2.3.6 Leupp Chapter-Specific Water Projects

Table 2-18 below shows 126 homes in the Chapter are estimated to need residential water improvements in 2020, of which 1 is in the FBFA. Table 2-19 shows the economic impact of constructing these improvements with a total capital budget of \$127,230. Table 2-20 shows the tax impacts.

Table 2-18. Leupp Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 1	1	100%	\$127,230	\$127,230
Power and water upgrade 125	125	0%	\$15,903,769	\$0
Total	126		\$16,030,999	\$127,230

Table 2-19. Leupp Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1	\$29,311	\$78,531	\$19,388	\$127,230
Indirect	0	\$12,119	\$17,080	\$9,884	\$39,083
Induced	0	\$6,733	\$8,701	\$5,777	\$21,211
Total	1	\$48,163	\$104,313	\$35,049	\$187,525

Table 2-20. Leupp Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$540	\$802	\$413	\$1,975	\$5,614	\$9,343
Indirect	\$784	\$1,159	\$599	\$2,376	\$2,627	\$7,545
Induced	\$215	\$318	\$164	\$708	\$1,409	\$2,813
Total	\$1,538	\$2,279	\$1,175	\$5,059	\$9,650	\$19,702

2.3.6.1 Excerpt from 2020 Leupp CLUP

The Chapter has identified Dinnebeto Wash and Grand Falls as areas that it wants to develop. Dinnebeto Wash needs to be connected to irrigation water. Grand Falls needs to be connected to water and electricity.

2.3.7 Tolani Lake Chapter-Specific Water Projects

Table 2-21 below shows 43 homes in Chapter are estimated to need residential water improvements in 2020, of which 13 are in the FBFA. Table 2-22 shows the economic impact of constructing these improvements with a total capital budget of \$1,654,478. Table 2-23 shows the tax impacts.

Table 2-21. Tolani Lake Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 13	13	100%	\$1,654,478	\$1,654,478
Power and water upgrade 30	30	0%	\$3,818,027	\$0
Total	43		\$5,472,505	\$1,654,478

Table 2-22. Tolani Lake Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	8	\$381,153	\$1,021,208	\$252,116	\$1,654,478
Indirect	4	\$157,591	\$222,111	\$128,533	\$508,234
Induced	2	\$87,556	\$113,149	\$75,124	\$275,829
Total	14	\$626,300	\$1,356,468	\$455,773	\$2,438,541

Table 2-23. Tolani Lake Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$7,017	\$10,425	\$5,366	\$25,681	\$73,009	\$121,497
Indirect	\$10,197	\$15,076	\$7,788	\$30,897	\$34,158	\$98,115
Induced	\$2,790	\$4,133	\$2,132	\$9,203	\$18,326	\$36,584
Total	\$20,004	\$29,633	\$15,285	\$65,781	\$125,493	\$256,196

2.3.7.1 Excerpts from the 2020 Tolani Lake CLUP

People in the Bennett Freeze portion of Tolani Lake indicate that they live on “No Water Mesa” (NWM). The name is self-explanatory.

In addition to TLE, the area is benefited by the Tolani Lake Livestock Water Users Association, which primarily focuses on utilizing water from the Lower Colorado River to benefit the Tolani Lake area. The area is devoid of windmills that draw and help store water. Also, the area does not have any artesian wells.

Tolani Lake Livestock Water Users Association

The Tolani Lake Livestock Water Users Association (TLLWUA) is working to bring water 18 miles to benefit the Livestock Range. This effort has been underway since the early 1990s, coordinating with the Natural Resources Conservation Service (NRCS) and the Bureau of Indian Affairs (BIA). One of the key programs benefitting the effort is the USDA Environmental Quality Incentives Program (EQIP).

The Water Users Association is running additional lines six miles to the east to the Range Management Units (RMU). Another line will serve the Bennett Freeze portion of the Tolani Lake Chapter. That particular project is challenged because the Navajo Nation does not recognize the Navajo Partitioned Lands (NPL), and a line cannot be extended to that area until grazing permits are in place. The project is complex because it involves the Navajo Partitioned Lands, the Hopi Partitioned Lands, “Big Navajo,” and the Bennett Freeze.

2.3.8 Tonalea Chapter-Specific Water Projects

Table 2-24 below shows 651 homes in the Chapter are estimated to need residential water improvements in 2020, of which 370 are in the FBFA. Table 2-25 shows the economic impact of constructing these improvements with a total capital budget of \$11,891,825. Table 2-26 shows the tax impacts.

Table 2-24. Tonalea Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 23	23	100%	\$3,101,840	\$3,101,840
Power and water upgrade 134	134	0%	\$18,071,587	\$0
Active and inactive 18	18	100%	\$525,919	\$525,919
Unfunded 476	476	100%	\$8,264,067	\$8,264,067
Total	651		\$29,963,412	\$11,891,825

Table 2-25. Tonalea Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	121	\$5,988,351	\$6,991,141	(\$1,087,667)	\$11,891,825
Indirect	17	\$813,889	\$1,279,511	\$600,390	\$2,693,789
Induced	25	\$1,101,107	\$1,422,969	\$944,778	\$3,468,854
Total	163	\$7,903,347	\$9,693,621	\$457,500	\$18,054,468

Table 2-26. Tonalea Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$28,159	\$42,651	\$21,629	\$158,624	\$1,025,127	\$1,276,191
Indirect	\$42,450	\$62,791	\$32,425	\$131,127	\$170,796	\$439,590
Induced	\$35,084	\$51,975	\$26,808	\$115,742	\$230,473	\$460,082
Total	\$105,694	\$157,417	\$80,863	\$405,494	\$1,426,396	\$2,175,863

2.3.9 Tuba City Chapter-Specific Water Projects

Table 2-27 below shows 2,090 homes in the Chapter are estimated to need residential water improvements in 2020, of which 1,566 are in the FBFA. Table 2-28 shows the economic impact of constructing these improvements with a total capital budget of \$11,449,534. Table 2-29 shows the tax impacts.

Table 2-27. Tuba City Water Projects – Capital Budgets

Event	# houses	FBFA %	Budget	IMPAN Input
Power and water upgrade 57	57	100%	\$7,458,411	\$7,458,411
Power and water upgrade 524	524	0%	\$68,565,045	\$0
Active and inactive 137	137	100%	\$3,568,035	\$3,568,035
Unfunded 1372	1,372	100%	\$423,087	\$423,087
Total	2,090		\$80,014,578	\$11,449,534

Table 2-28. Tuba City Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	85	\$4,158,056	\$6,903,794	\$387,684	\$11,449,534
Indirect	21	\$941,378	\$1,388,755	\$738,116	\$3,068,249
Induced	18	\$826,701	\$1,068,352	\$709,327	\$2,604,380
Total	125	\$5,926,135	\$9,360,900	\$1,835,127	\$17,122,163

Table 2-29. Tuba City Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$38,136	\$57,038	\$29,205	\$165,570	\$739,404	\$1,029,354
Indirect	\$56,132	\$83,004	\$42,873	\$171,253	\$201,417	\$554,680
Induced	\$26,341	\$39,022	\$20,127	\$86,898	\$173,037	\$345,424
Total	\$120,609	\$179,064	\$92,205	\$423,721	\$1,113,858	\$1,929,458

2.3.9.1 Excerpt from the 2008 Tuba City CLUP

Many scattered site homes are not connected to municipal water systems due to these systems' remoteness and cost and the inefficiency of extending these systems to isolated locations. At the same time, the Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Those homes located close to existing water systems should be hooked up. Those too far from existing systems should be retrofitted for plumbing and provided nearby watering points where safe water for drinking and domestic use can be collected and hauled.

As part of the FBFA Recovery Plan, a system of residential zones is being proposed to distinguish among those homes close enough to hook up to existing municipal water systems, those homes already near safe watering points, and those homes in remote locations that must haul water from long distances. Two major issues are facing those in remote homes. One is the cost, stress, and labor of hauling the water from far away to their homes—a particular burden for elderly residents living alone and their families who help care for them. Another risk is that many people in these remote areas resort to using water from nearby windmills or earthen dams instead of traveling long distances to a safer water source. Water from windmills and earthen dams, intended for livestock use, is not tested for water quality and is at risk for airborne and bacterial contamination from contact with animals.

2.3.9.2 Excerpt from the 2020 Tuba City CLUP

Water – Domestic and Livestock Use

Although the problem is much worse on the Bennett Freeze portion of the Tuba City Chapter, there are still locations within the Administrative Area that do not have access to water for domestic use. Furthermore, the Tuba City area depends on groundwater from the N Aquifer for domestic, agricultural, municipal, and industrial needs, and they are concerned that the excessive drilling and pumping of water out of the N aquifer over the years is resulting in the degradation of water quality in the N Aquifer. Two of the main concerns include arsenic and uranium. Due to historical events that entailed massive water usages, such as uranium mining and the Peabody Coalmine operations, Tuba City would like to closely monitor the municipal water supply to prevent potential health risks.

2.4 Total Chapter-Specific Water Project Impacts

Table 2-30 below shows the combined economic impact of constructing the Chapter-specific water projects within each of the nine Chapters. These projects will serve 4,017 homes. The combined capital budget is \$79 million, and the total economic impact is \$119 million. This activity will generate over \$6 million in tax revenue.

Table 2-30. Chapter-Specific Water Projects – Economic Impacts

Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	740	\$36,398,510	\$46,699,524	(\$4,265,611)	78,832,423
Indirect	122	\$5,719,126	\$8,803,889	\$4,308,524	18,831,538
Induced	152	\$6,820,291	\$8,813,915	\$5,851,975	21,486,181
Total	1,014	\$48,937,927	\$64,317,327	\$5,894,888	\$119,150,143

Table 2-31. Chapter-Specific Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	161,651	\$243,861	\$124,047	\$843,979	5,007,134	6,380,673
Indirect	241,854	\$357,710	\$184,732	\$744,185	940,042	2,468,523
Induced	172,766	\$255,940	\$132,012	\$569,951	1,134,920	2,265,590
Total	576,271	\$857,512	\$440,792	\$2,158,116	\$3,456,419	\$6,055,327

2.5 Regional Chapter-Specific Water Projects

The Navajo Thaw Regional Recovery Plan (2020) introduces the Water Infrastructure Section with reference to the Brown and Caldwell Report.

In September 2013, Brown and Caldwell was authorized by the Navajo Nation to prepare the Tuba City Regional Water Plan (Plan). This plan was developed for the “Tuba City Nine Chapters (now known as the Navajo Thaw Region),” and included water planning for the Bodaway-Gap, Cameron, Coalmine Canyon, Coppermine, Inscription House, Kaibeto, LeChee, Red Lake #1/Tonalea, and Tuba City Chapters. (Note: The region is slightly different from the Navajo Thaw Region).

The plan summarized existing and anticipated water needs within that region, reviewed water resources available to serve those demands, evaluated alternatives to address supply deficiencies, and recommended a preferred alternative for implementation to address short- and long-term water supply deficiencies.

Brown and Caldwell is a part of the Navajo Thaw Support Team, working to develop and implement the Navajo Thaw Implementation Plan.

The section describes Western Navajo Pipeline Phase 1 with descriptions of several aspects of the projects. Some cost figures are listed for each Chapter, but not for the Phase 1 projects described. Approximately \$200 million is listed, which is less than half of the cost of the Western Navajo Pipeline Project listed in the 2008 Recovery Plan. This analysis assumes that Phase 1 of the pipeline is included in the total cost showing in the 2008 Recovery Plan.

The 2008 Recovery Plan identified two major water infrastructure projects, recommending “as part of its regional projects full-funding for both the Western Navajo Pipeline and the C-aquifer Leupp to Dilkon Pipeline, which will provide a new or additional water source to approximately 75 percent of the people in the nine Chapters.” Note that in the Bodaway Gap CLUP appendix, the portion of the nine Chapter population standing to benefit is stated to be 60 percent.

The capital budgets and resulting economic impacts of these two projects are shown in Tables 2-32 through 2-34.

Table 2-32. Regional Water Projects – Capital Budgets

Event	FBFA %	Budget	IMPAN Input
Western Navajo Pipeline	100%	\$455,510,966	\$455,510,966
Pipeline - C-aquifer Leupp to Dilkon	100%	\$127,017,481	\$127,017,481
Total		\$582,528,447	\$582,528,447

Table 2-33. Regional Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	6,955	\$345,306,346	\$336,883,901	(\$99,661,801)	\$582,528,447
Indirect	714	\$34,769,383	\$57,608,160	\$24,236,780	\$116,614,323
Induced	1,375	\$61,484,566	\$79,456,969	\$52,755,387	\$193,696,922
Total	9,044	\$441,560,295	\$473,949,030	(\$22,669,634)	\$892,839,692

Table 2-34. Regional Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$1,023,036	\$1,572,956	\$788,625	\$7,355,090	\$58,219,788	\$68,959,495
Indirect	\$1,586,169	\$2,347,032	\$1,211,670	\$4,968,650	\$7,171,413	\$17,284,935
Induced	\$1,959,077	\$2,902,224	\$1,496,944	\$6,462,935	\$12,869,326	\$25,690,507
Total	\$4,568,283	\$6,822,212	\$3,497,240	\$18,786,675	\$78,260,527	\$111,934,937

3. Infrastructure Capital Improvement Projects

The Infrastructure Capital Improvement water projects were already separated. I was planning to pull some descriptions from the various 2020 CLUPs to explain each of these projects.

3.1 Infrastructure Capital Improvement Water Project Impacts by Chapter

Table 3-1 below shows the seven Infrastructure Capital Improvement water projects budgets by Chapter.

Table 3-1. Inputs for the Infrastructure Capital Improvement Plan Water System Projects

Chapter	Project Description	Sector	Cap Ex Budget
Bodaway Gap	Water line extension east/west Chapter	56	\$713,786
Cameron	Upgrade Chapter Sewer line	60	\$138,678
Coalmine	Water/sewer phase II w/booster station	56	\$774,967
Coppermine	KOKO waterline project extension	56	\$19,437,911
Coppermine	Agriculture water development	49	\$20,394
Leupp	Round Cedar – Grand Falls waterline extension	56	\$892,232
Tolani Lake	Water Line 10 miles north of Chapter	56	\$522,083
Total			\$22,500,052

3.1.1 Bodaway Gap Infrastructure Capital Improvement Water Project Impacts

Table 3-2. Bodaway Gap Infrastructure Capital Improvement Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	9	\$423,112	\$412,792	(\$122,118)	\$713,786
Indirect	1	\$42,604	\$70,589	\$29,698	\$142,890
Induced	2	\$75,338	\$97,360	\$64,642	\$237,341
Total	11	\$541,054	\$580,741	(\$27,778)	\$1,094,017

Table 3-3. Bodaway Gap Infrastructure Capital Improvement Project Water Project – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$1,254	\$1,927	\$966	\$9,012	\$71,338	\$84,498
Indirect	\$1,944	\$2,876	\$1,485	\$6,088	\$8,787	\$21,180
Induced	\$2,401	\$3,556	\$1,834	\$7,919	\$15,769	\$31,479
Total	\$5,598	\$8,359	\$4,285	\$23,020	\$95,894	\$137,156

3.1.2 Cameron Infrastructure Capital Improvement Water Project Impacts

Table 3-4. Cameron Infrastructure Capital Improvement Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	1	\$35,008	\$86,867	\$16,803	\$138,678
Indirect	0	\$10,905	\$16,625	\$8,523	\$36,053
Induced	0	\$7,458	\$9,638	\$6,398	\$23,493
Total	1	\$53,370	\$113,130	\$31,725	\$198,225

Table 3-5. Cameron Infrastructure Capital Improvement Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$349	\$522	\$267	\$1,521	\$6,476	\$9,135
Indirect	\$640	\$947	\$489	\$1,957	\$2,319	\$6,353
Induced	\$238	\$352	\$182	\$784	\$1,561	\$3,116
Total	\$1,227	\$1,821	\$938	\$4,262	\$10,356	\$18,604

3.1.2.1 Excerpt from the 2020 Cameron CLUP

The most notable project implementing the Value-added Agriculture strategy is Cameron Farm Enterprise. The mission statement for this project is “Putting wisdom and water to work rebuilding our agricultural economy in Hozho.” The project will create a 133-acre enterprise farm, which will serve as a model for the Lower Colorado River. The project entails building infrastructure (fences, wells, solar power, pipes, and irrigation systems), developing policies for farming and community garden plots, hiring staff and recruiting youth growers, offering garden plots to families, planting and tending crops, offering beginning farmer training at an incubator farm, harvesting crops for market and community giveaways, celebrating the land, and learning to share with other communities. This project also supports efforts to maintain water rights. Cameron has received funding in a partnership with Tolani Lake Enterprises for this project. Work is underway, including many of the studies and surveys that will support the water wells and the overall project. The Cameron Farm Enterprise project received a commitment of \$100,000 of funding from the Sihasin Fund to complete their project. Funding is still needed for architectural clearances and work to meet the Endangered Species Act.

3.1.3 Coalmine Canyon Infrastructure Capital Improvement Water Project Impacts

Table 3-6. Coalmine Canyon Infrastructure Capital Improvement Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	9	\$459,379	\$448,174	(\$132,585)	\$774,967
Indirect	1	\$46,255	\$76,639	\$32,243	\$155,138
Induced	2	\$81,796	\$105,706	\$70,183	\$257,685
Total	12	\$587,430	\$630,519	(\$30,159)	\$1,187,790

Table 3-7. Coalmine Canyon Infrastructure Capital Improvement Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$1,361	\$2,093	\$1,049	\$9,785	\$77,453	\$91,740
Indirect	\$2,110	\$3,122	\$1,612	\$6,610	\$9,541	\$22,995
Induced	\$2,606	\$3,861	\$1,991	\$8,598	\$17,121	\$34,177
Total	\$6,077	\$9,076	\$4,653	\$24,993	\$104,114	\$148,913

3.1.3.1 Excerpt from the 2020 Coalmine Canyon CLUP

The Coalmine Canyon Chapter's objective is to improve health, sanitation, and overall enhancement of the quality of life for nine families in dire need of waterline extension. Limited areas of the community are served by the public water system. It is the project's intent to provide families access to water, increasing the probability of improving the community members' general health and well-being.

3.1.4 Coppermine Infrastructure Capital Improvement Water Project Impacts

Table 3-8. Coppermine Infrastructure Capital Improvement Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	232	\$11,526,855	\$11,251,263	(\$3,319,963)	\$19,458,155
Indirect	24	\$1,161,861	\$1,925,274	\$809,741	\$3,896,876
Induced	46	\$2,052,656	\$2,652,663	\$1,761,234	\$6,466,553
Total	302	14,741,372	15,829,200	(748,988)	29,821,584

Table 3-9. Coppermine Infrastructure Capital Improvement Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$34,405	\$52,883	\$26,520	\$246,252	\$1,943,746	\$2,303,806
Indirect	\$52,957	\$78,360	\$40,454	\$165,903	\$239,626	\$577,300
Induced	\$65,404	\$96,891	\$49,975	\$215,765	\$429,641	\$857,675
Total	\$152,766	\$228,134	\$116,949	\$627,919	\$2,613,014	\$3,738,782

3.1.4.1 Excerpt from the 2020 Coppermine CLUP

Top priorities for the Coppermine Chapter include three waterline extensions. These projects are known as the:

- KOKO Project
- Phase 1 Project
- Phase 2 Project

In total, these three waterline extensions will serve 60 homes, which are all in the FBFA. The project will include kitchen and bath additions. HIS will be doing the plumbing for bathrooms. The Chapter will provide matching funds both from their Housing Escrow Fund as well as Chapter discretionary funds. Another infrastructure

project, this one not in the Coppermine CIP, is the Highway 89 Waterline Extension project. Indian Health Service is coordinating this project.

In addition to the KOKO Project, there is an Infrastructure Capital Improvement Project in Coppermine for agriculture water development budgeted at \$20,000, which is included in the economic and tax impacts shown above.

3.1.5 Leupp Infrastructure Capital Improvement Water Project Impacts

Table 3-10. Leupp Infrastructure Capital Improvement Water Project – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	11	\$528,890	\$515,990	(\$152,647)	\$892,232
Indirect	1	\$53,255	\$88,236	\$37,122	\$178,613
Induced	2	\$94,173	\$121,701	\$80,803	\$296,677
Total	14	\$676,318	\$725,926	(\$34,722)	\$1,367,521

Table 3-11. Leupp Infrastructure Capital Improvement Water Project – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$1,567	\$2,409	\$1,208	\$11,265	\$89,173	\$105,622
Indirect	\$2,429	\$3,595	\$1,856	\$7,610	\$10,984	\$26,475
Induced	\$3,001	\$4,445	\$2,293	\$9,899	\$19,711	\$39,349
Total	\$6,997	\$10,449	\$5,357	\$28,775	\$119,868	\$171,446

3.1.6 Tolani Lake Infrastructure Capital Improvement Water Project Impacts

Table 3-12. Tolani Lake Infrastructure Capital Improvement Water Project – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	6	\$309,476	\$301,928	(\$89,321)	\$522,083
Indirect	1	\$31,162	\$51,631	\$21,722	\$104,514
Induced	1	\$55,105	\$71,212	\$47,281	\$173,598
Total	8	\$395,742	\$424,770	(\$20,317)	\$800,195

Table 3-13. Tolani Lake Infrastructure Capital Improvement Water Project – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$917	\$1,410	\$707	\$6,592	\$52,179	\$61,804
Indirect	\$1,422	\$2,104	\$1,086	\$4,453	\$6,427	\$15,491
Induced	\$1,756	\$2,601	\$1,342	\$5,792	\$11,534	\$23,025

Type	Sub County	Special Districts	County	State	Federal	Total
Total	\$4,094	\$6,114	\$3,134	\$16,837	\$70,140	\$100,320

3.1.6.1 Excerpts from the 2020 Tolani Lake CLUP

Yadeeskid Waterline Project

The second priority project to the Senior Center is the Yadeeskid Waterline Project. This project is approximately 3 miles north of the Chapter House.

Tolani Lake Livestock and Water Users Association

An ongoing project—the Tolani Lake Livestock and Water Users Association—is working to draw water through a waterline to benefit ranching and agricultural practices. The initial project is a 6-mile waterline that could be extended in the future to benefit the Bennett Freeze portion of the Chapter.

3.2 Combined Infrastructure Capital Improvement Water Project Impacts

Table 3-14. Combined Infrastructure Capital Improvement Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	268	\$13,282,720	\$13,017,013	(\$3,799,830)	\$22,499,902
Indirect	28	\$1,346,041	\$2,228,993	\$939,050	\$4,514,083
Induced	53	\$2,366,526	\$3,058,280	\$2,030,542	\$7,455,348
Total	348	\$16,995,287	\$18,304,286	(\$830,239)	\$34,469,334

Table 3-15. Combined Infrastructure Capital Improvement Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$39,853	\$61,244	\$30,717	\$284,427	\$2,240,365	\$2,656,605
Indirect	\$61,502	\$91,004	\$46,981	\$192,622	\$277,685	\$669,794
Induced	\$75,404	\$111,706	\$57,617	\$248,757	\$495,337	\$988,821
Total	\$176,759	\$263,954	\$135,316	\$725,806	\$3,013,386	\$4,315,221

4. Immediate Recovery Projects

4.1 Little Colorado River Valley Farms Project

The Little Colorado River (LCR) Valley Farms Plan ranges from 100 to 4,000 acres of fertile, irrigable soils adjacent to the alluvial aquifer of the LCR. This analysis is based on the 4,000-acre size. This economic impact analysis considers both construction costs as well as the annual operating expenses. Contingency expenses are not modeled as they are undefined. The value of and revenues derived from crop production over time are not within the scope of this analysis.

4.1.1 Construction of the Little Colorado River Valley Farms Project

Initial project development includes land development followed by water development and delivery.

Table 4-1. Inputs for the Little Colorado River Valley Farms Construction

Event Year	Project Description	Sector	Cap Ex Budget
2021	Land and water development, water delivery	56	\$28,551,424
2021	Construction of farm facilities, equipment	55	\$24,472,649
Total			\$53,024,073

Table 4-2. Total Economic Impact of the Little Colorado River Valley Farms Construction

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	548	\$26,774,817	\$28,871,923	(\$2,622,667)	\$53,024,073
Indirect	55	\$2,685,219	\$4,649,926	\$1,829,589	\$9,164,734
Induced	107	\$4,767,760	\$6,161,421	\$4,090,629	\$15,019,810
Total	710	\$34,227,796	\$39,683,269	\$3,297,552	\$77,208,618

4.1.2 Operation of the Little Colorado River Valley Farms Project

The 2020 Recovery Plan provides budget estimates for the ongoing operations of this project. Thus, the annual operating impact has been modeled and is presented.

The budget for organizational development and youth capacity building scales linearly from the 100-acre budget. This may not be the case upon implementation. While management and education expenses would increase with the project's size, economies of scale would have an effect. Rather than \$10 million per year, we assume each of these expenditures to be \$2 million per year.

Table 4-3. Inputs for the Little Colorado River Valley Farms Annual Operations

Event Year	Project Description	Sector	Cap Ex Budget
2021	Annual Crop Production	2	\$7,280,613
2021	Water Quality Monitoring	49	\$2,651,204

Event Year	Project Description	Sector	Cap Ex Budget
2021	Organizational Development	469	\$2,039,387
2021	Youth Capacity Building	482	\$2,039,387
Total			\$14,010,592

Table 4-4. Total Economic Impact of the Little Colorado River Valley Farms Annual Operations

Type	Annual Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	350	\$4,241,235	\$6,427,502	\$3,278,827	\$13,947,564
Indirect	25	\$1,023,851	\$1,944,741	\$670,221	\$3,638,813
Induced	19	\$865,624	\$1,118,662	\$742,479	\$2,726,765
Total	394	\$6,130,710	\$9,490,905	\$4,691,527	\$20,313,143

4.2 Livestock and Water Projects

The 2020 Recovery Plan explains that region-wide investment in livestock infrastructure is decades behind and necessary. This IMPLAN model does not include non-construction or “other” expenses. Also, we assume the impoundment repair is carried out by the Navajo Department of Water Resources at the cost of \$6 million as described in the 2020 Recovery Plan.

Improvements to Earthen Dams (from 2020 Bodaway Gap CLUP)

There are approximately 100 earthen dams at the Bodaway Gap Chapter. These dam structures were built in the 1950s and 1960s, and area ranchers still rely on this infrastructure for livestock. Unfortunately, soil and silt from wind erosion have blown into the earthen dams, rendering many of them unfunctional. A wholesale earthen dam recovery project needs to benefit the Bodaway Gap Chapter and the other Navajo Thaw Region's other Chapters. There is a strong desire by the Navajo Nation Division of Natural Resources to conduct this work.

Table 4-5. Inputs for the Livestock and Water Projects

Event Year	Project Description	Sector	Cap Ex Budget
2021	Livestock water components	56	\$3,067,145
2021	Livestock power components	52	\$173,858
2021	Impoundment repair and maintenance	60	\$6,118,162
Total			\$9,359,165

Table 4-6. Total Economic Impact of the Livestock and Water Projects

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	69	\$3,412,680	\$5,685,576	\$260,910	\$9,359,165
Indirect	14	\$672,967	\$1,050,903	\$509,699	\$2,233,569
Induced	15	\$662,294	\$855,888	\$568,230	\$2,086,412
Total	98	\$4,747,940	\$7,592,367	\$1,338,839	\$13,679,146

4.3 Total Immediate Recovery Water Projects

Table 4-7. Combined Immediate Recovery Water Projects – Economic Impacts

Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	968	\$34,428,732	\$40,985,001	\$917,070	\$76,330,803
Indirect	94	\$4,382,037	\$7,645,570	\$3,009,509	\$15,037,116
Induced	141	\$6,295,678	\$8,135,971	\$5,401,338	\$19,832,988
Total	1,202	\$45,106,446	\$56,766,542	\$9,327,918	\$111,200,906

Table 4-8. Combined Immediate Recovery Water Projects – Tax Impacts

Type	Sub County	Special Districts	County	State	Federal	Total
Direct	\$78,104	\$121,585	\$60,388	\$706,787	\$6,012,195	\$6,979,059
Indirect	\$169,450	\$250,858	\$129,457	\$542,055	\$890,143	\$1,981,964
Induced	\$200,568	\$297,126	\$153,255	\$661,681	\$1,317,730	\$2,630,360
Total	\$448,122	\$669,569	\$343,101	\$1,910,523	\$8,220,068	\$11,591,383

5. Combined Water Projects

The total capital budget for Chapter-specific and Infrastructure Capital Improvement water projects within each of the nine Chapters is just over \$100 million.

Table 5-1. Combined Chapter-Specific and Infrastructure Capital Improvement Water Project Budgets by Chapter

Chapter	Cap Ex Budget
Bodaway Gap	\$17,576,892
Cameron	\$18,950,551
Coalmine Canyon	\$5,255,913
Coppermine	\$20,858,248
Kaibeto	\$12,153,488
Leupp	\$1,019,462
Tolani Lake	\$2,176,561
Tonalea	\$11,891,825
Tuba City	\$11,449,534
Total	\$101,332,475

6. Total Economic Impacts of all 2020 Recovery Plan Water Projects

The Chapter-specific water projects within each Chapter are primarily residential and would improve water service to 4,017 houses within the FBFA at the cost of \$79 million.

The 2020 Recovery Plan shows a total implementation budget of \$3.6 billion, including \$582 million for the two regional pipeline projects, the Western Navajo Pipeline and the C-aquifer Leupp to Dilkon Pipeline.

A total of \$22.5 million is budgeted for seven Infrastructure Capital Improvement Plan water projects, primarily water and sewer lines.

Within the Immediate Recovery category, the Little Colorado River Valley Farms Project accounts for most water development within that category. The total budget for Immediate Recovery water projects is \$76 million.

The total direct investment for the various water projects within the 2020 Recovery Plan is \$760 million, and the resulting total economic impact is almost \$1.2 billion. This economic activity would create a total of 11,600 1-year jobs.

Table 6-1. Economic Impacts by Project Category

Economic Impacts by Project Category					
Total Economic Impact of Nine Chapter-Specific Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	740	\$36,398,510	\$46,699,524	(\$4,265,611)	\$78,832,423
Indirect	122	\$5,719,126	\$8,803,889	\$4,308,524	\$18,831,538
Induced	152	\$6,820,291	\$8,813,915	\$5,851,975	\$21,486,181
Total	1,014	\$48,937,927	\$64,317,327	\$5,894,888	\$119,150,143
Total Economic Impact of the Regional Chapter-Specific Water Projects					
Impact Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	6,955	\$345,306,346	\$336,883,901	-\$99,661,801	\$582,528,447
Indirect	714	\$34,769,383	\$57,608,160	\$24,236,780	\$116,614,323
Induced	1,375	\$61,484,566	\$79,456,969	\$52,755,387	\$193,696,922
Total	9,044	\$441,560,295	\$473,949,030	-\$22,669,634	\$892,839,692
Total Economic Impact of Infrastructure Capital Improvement Plan Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	268	\$13,282,720	\$13,017,013	(\$3,799,830)	\$22,499,902
Indirect	28	\$1,346,041	\$2,228,993	\$939,050	\$4,514,083
Induced	53	\$2,366,526	\$3,058,280	\$2,030,542	\$7,455,348
Total	348	\$16,995,287	\$18,304,286	(\$830,239)	\$34,469,334

Economic Impacts by Project Category					
Total Economic Impact of Immediate Recovery Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	968	\$34,428,732	\$40,985,001	\$917,070	\$76,330,803
Indirect	94	\$4,382,037	\$7,645,570	\$3,009,509	\$15,037,116
Induced	141	\$6,295,678	\$8,135,971	\$5,401,338	\$19,832,988
Total	1,202	\$45,106,446	\$56,766,542	\$9,327,918	\$111,200,906
Grand Total Economic Impact of All Water Projects					
Type	Jobs	Labor Income	Intermediate Expenses	Taxes/ Profits	Total Output
Direct	8,931	\$429,416,307	\$437,585,439	(\$106,810,171)	\$760,191,575
Indirect	958	\$46,216,586	\$76,286,612	\$32,493,862	\$154,997,061
Induced	1,721	\$76,967,062	\$99,465,134	\$66,039,243	\$242,471,439
Total	11,608	\$552,599,955	\$613,337,185	(\$8,277,066)	\$1,157,660,074

7. Water Supply Excerpts from the 2008 Recovery Plan

7.1 2008 Recover Plan Excerpts

7.1.1 Water Demand and Supply Plans

The following section is taken directly from the 2008 Recovery Plan Section 3.9.6.1.

Development can only occur when sufficient water is available. Without it, development is either impossible or cannot be supported or sustained. Water planning to establish demand, potential water sources, availability, and water supply is the driver of development. With water availability, development is possible; without it, it is not.

As the 2008 Water Resource Development Strategy draft states:

The lack of infrastructure, the lack of economic development, and sustained poverty are closely connected. Throughout the arid southwest, and especially on the Navajo Nation, a reliable water supply is essential for jump-starting and sustaining economic development.

The development plans discussed in the Recovery Plan are contingent on sufficient water planning to support them. Close coordination with Water Resources is crucial to establish the conditions under which development becomes possible in the area, whether to support current residents without access to water other than water hauling or support new residents to the area, or to support current or future businesses, industry, recreational opportunities, or community facilities.

The latest report from Water Resources that was fully adopted was completed in 2000, laying out the Water Resources Management Strategy for the Navajo Nation. This report is currently being updated, and there is a draft dated 2008 in circulation. There are two regional water supply projects included that will improve water supply in the FBFA if implemented.

- *Western Navajo Pipeline*: appraisal level study completed as part of the North Central Arizona Water Supply Study by the Bureau of Reclamation, which is now seeking feasibility level study authority. The Western Navajo Pipeline is key to establishing a sustainable water supply in the area.
- *C-aquifer Leupp to Dilkon Pipeline*: Project alignment and preliminary cost estimate complete as of 2008, with further studies ongoing.

Full funding of the recommendations contained in this excellent study is highly recommended and included in the project lists.

Two projects included in the 2000 Water Resources Management Strategy that would have helped serve the FBFA over the next forty years have been de-emphasized in the 2008 draft.

- *Alternative Water Supply for Black Mesa*, which was to be either a Lake Powell Peabody Pipeline or a C-aquifer Black Mesa Pipeline originally proposed in the 1999 LCR Agreements in Concept
- *Three Canyon Water Supply Project*, also proposed in the 1999 LCR Agreements in Concept.

The 2008 strategy plan also includes specific plans for developing and rehabilitating local water supply infrastructure, as well as addressing small domestic and municipal systems not connected to a regional water supply project. Additionally, the 2008 draft strategies ways to improve water service delivery to uses without

direct access to public water systems, provide irrigation to agricultural projects, and encourage water conservation and water reuse.

Associated with this effort, the U.S. Bureau of Reclamation conducted an assessment in 2003-2004 of the Navajo and Hopi water supply for a study area that includes the entire FBFA, among other locations.

This “Assessment of Western Navajo and Hopi Water Supply Needs, Alternatives, and Impacts” estimates water supply demand with assumed population growth across the Nation of 2.48% and water supply alternatives for three demand scenarios – low, medium, and high.

Future development must be coordinated with Water Resources (see **Section Error! Reference source not found.**, which is currently working on a plan for needs and water use. All estimates of water availability and quantity should be investigated through Water Resources.

IHS, NTUA, and BIA also have ongoing planning efforts for local water and wastewater utility service provisions, which should be incorporated into future planning efforts for the FBFA (see **Section Error! Reference source not found.**).

7.1.2 Water Delivery

The provision of water to residents in remote areas remain mainly a policy decision about how far it is reasonable to expect a resident to travel to haul water from a safe drinking water source and how far to go to accommodate those choosing to live in remote conditions. These decisions must be balanced with the fact that many living too far from a regulated drinking water source will resort to using water intended to livestock, which is not monitored for quality or protected from bacterial and other contaminants. Water Resources also has a good discussion of water hauling and its financial impacts on residents already stretched by challenging economic conditions in its Strategy document for the Nation.

Because the best policy solution for providing water to scattered homesites has not been identified, the project list seen in **Section Error! Reference source not found.** estimates an average cost per scattered home of providing solutions for water delivery at \$20-30,000. This per home cost was multiplied by the number of scattered homes (assumed to be 1,200 sq. ft. each) in the Chapter needing water to calculate a total project cost. These funds could be pooled by residents to purchase their own water hauling trucks or pooled across Chapters to purchase multiple trucks and start a regular service delivery.

The approach taken in this plan is based on identifying the solution will require (1) political and policy decisions, (2) more technical study of potential solutions, and (3) a more narrowly focused planning effort to zero in on both the problems and the best approach to provide water locally from each community to each scattered home.

Appendix C – List of Projects Eligible for Categorical Exclusion

Categorical exclusion (CE) means a category of actions that do not have a significant effect on the human environment, and which have been found to have no such effect and for which; therefore, neither an environmental assessment nor an environmental impact statement is required (CEQ 2020). Many of the management activities that may occur in the Former Bennett Freeze Area (FBFA) are eligible as CEs, according to the Bureau of Indian Affairs (BIA).

According to the BIA National Environmental Policy Act (NEPA) guidance manual, “Most federal actions do not result in significant environmental impacts. The CEs are categories of actions that federal agencies have determined do not have a significant effect on the quality of the human environment and neither an Environmental Assessment (EA) nor an Environmental Impact Statement (EIS) is required.” (BIA 2012). According to this BIA NEPA guidance, “The majority of federal actions reviewed by the BIA fall under CEs.”

The BIA compiled their list of activities that would be eligible for CEs in coordination with the Council on Environmental Quality (CEQ) and published them in the Federal Register for public review. The United States Department of the Interior Manual for BIA Part 516 DM10 includes the final lists of actions designated as CEs (CEQ 2020). Some of the activities that are included in the Integrated Resource Management Plan that are eligible as CEs according to the BIA are listed in Table C-1.

Appendix Table C-1. Categorical Exclusions Relevant to the Former Bennett Freeze Area Integrated Natural Resource Management Plan

Agency/Type of Action	Categorical Exclusions
Operation, maintenance, and replacement of existing facilities	<ul style="list-style-type: none"> ▪ Operation, maintenance, and replacement of existing facilities that involve normal renovation of buildings, road maintenance, and rehabilitation of irrigation structures. ▪ Transfer of existing operation and maintenance activities of federal facilities to tribal groups, water user organizations, or other entities where the anticipated operation and maintenance activities are agreed upon in a contract, follow BIA policy, and no change in operations or maintenance is anticipated.
Self-Determination and Self-Governance	<ul style="list-style-type: none"> ▪ Self-Determination Act contracts and grants for BIA programs listed as categorical exclusions, or for programs in which environmental impacts are adequately addressed in earlier NEPA analysis. ▪ Self-Governance compacts for BIA programs which are listed as categorical exclusions or for programs in which environmental impacts are adequately addressed in earlier NEPA analysis.
Rights-of-way (ROW)	<ul style="list-style-type: none"> ▪ A ROW inside another ROW or amendments to a ROW where no deviations from or additions to the original ROW are involved and where there is an existing NEPA analysis covering the same or similar impacts in the ROW area. ▪ Service line agreements to an individual residence, building, or well from an existing facility where installation will involve no clearance of vegetation from the ROW other than for placement of poles, signs (including highway signs), or buried power/cable lines. ▪ Renewals, assignments, and conversions of existing ROW where there would be essentially no change in use and continuation would not lead to environmental degradation.
Roads and Transportation	<ul style="list-style-type: none"> ▪ Approval of utility installations along or across a transportation facility located in whole within the limits of the roadway right-of-way. ▪ Construction of bicycle and pedestrian lanes and paths adjacent to existing highways and within the existing rights-of-way. ▪ Activities included in a "highway safety plan" under 23 CFR 402. ▪ Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur. ▪ Emergency repairs under 23 U.S.C. 125. ▪ Acquisition of scenic easements.

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> ▪ Alterations to facilities to make them accessible for the elderly or handicapped. ▪ Resurfacing a highway without adding to the existing width. ▪ Rehabilitation, reconstruction, or replacement of an existing bridge structure on essentially the same alignment or location (e.g., widening, adding shoulders or safety lanes, walkways, bikeways, or guardrails). ▪ Approvals for changes in access control within existing rights-of-way. ▪ Road construction within an existing right-of-way, which has already been acquired for a HUD housing project and for which earlier NEPA analysis has already been prepared.
Forestry	<ul style="list-style-type: none"> ▪ Approval of free-use cutting, without permit, to Indian owners for on-reservation personal use of forest products, not to exceed 2,500 feet board measure when cutting will not adversely affect associated resources such as riparian zones, areas of special significance, etc. ▪ Approval and issuance of cutting permits for forest products not to exceed \$5,000 in value. ▪ Approval and issuance of paid timber cutting permits or contracts for products valued at less than \$25,000 when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of Fire Management Planning Analysis detailing emergency fire suppression activities. ▪ Approval of emergency forest and range rehabilitation plans when limited to environmental stabilization on less than 10,000 acres and not including approval of salvage sales of damaged timber. ▪ Approval of forest stand improvement projects of less than 2,000 acres when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of prescribed burning plans of less than 2,000 acres when in compliance with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Approval of forestation projects with native species and associated protection and site preparation activities on less than 2000 acres when consistent with policies and guidelines established by a current management plan addressed in earlier NEPA analysis. ▪ Harvesting live trees not to exceed 70 acres, requiring no more than 0.5 mile of temporary road construction. Such activities: <ul style="list-style-type: none"> • Shall not include even aged regeneration harvests or vegetation type conversions. • May include incidental removal of trees for landings, skid trails, and road clearing.

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> ▪ May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or Tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and ▪ Shall require the treatment of temporary roads constructed or used to permit the reestablishment by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. Examples include, but are not limited to: <ul style="list-style-type: none"> • Removing individual trees for sawlogs, specialty products, or fuelwood. • Commercial thinning of overstocked stands to achieve the desired stocking level to increase health and vigor. ▪ Salvaging dead or dying trees not to exceed 250 acres, requiring no more than 0.5 mile of temporary road construction. Such activities: <ul style="list-style-type: none"> • May include incidental removal of live or dead trees for landings, skid trails, and road clearing. • May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or Tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and • Shall require the treatment of temporary roads constructed or used to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. ▪ For this CE, a dying tree is defined as a standing tree that has been severely damaged by forces such as fire, wind, ice, insects, or disease, such that in the judgment of an experienced forest professional or someone technically trained for the work, the tree is likely to die within a few years. Examples include, but are not limited to:

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> • Commercial and non-commercial sanitation harvest of trees to control insects or disease not to exceed 250 acres, requiring no more than 0.5 miles of temporary road construction. Such activities: • May include removal of infested/infected trees and adjacent live uninfested/uninfected trees as determined necessary to control the spread of insects or disease; and • May include incidental removal of live or dead trees for landings, skid trails, and road clearing. <ul style="list-style-type: none"> ▪ May include temporary roads which are defined as roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be part of the BIA or tribal transportation systems and not necessary for long-term resource management. Temporary roads shall be designed to standards appropriate for the intended uses, considering safety, cost of transportation, and impacts on land and resources; and ▪ Shall require the treatment of temporary roads constructed or used to permit the reestablishment, by artificial or natural means, of vegetative cover on the roadway and areas where the vegetative cover was disturbed by the construction or use of the road, as necessary to minimize erosion from the disturbed area. Such treatment shall be designed to reestablish vegetative cover as soon as practicable, but at least within 10 years after the termination of the contract. Examples include, but are not limited to: <ul style="list-style-type: none"> • Land Conveyance and Other Transfers. Approvals or grants of conveyances and other transfers of interests in land where no change in land use is planned. ▪ Reservation Proclamations. Lands established as or added to a reservation pursuant to 25 U.S.C. 467, where no change in land use is planned.
Waste Management	<ul style="list-style-type: none"> ▪ Closure operations for solid waste facilities when done in compliance with other federal laws and regulations and where cover material is taken from locations which have been approved for use by earlier NEPA analysis. ▪ Activities involving remediation of hazardous waste sites if done in compliance with applicable federal laws such as the Resource Conservation and Recovery Act (P.L. 94-580), Comprehensive Environmental Response, Compensation, and Liability Act (P.L. 96-516) or Toxic Substances Control Act (P.L. 94-469).
Other	<ul style="list-style-type: none"> ▪ Data gathering activities such as inventories, soil and range surveys, timber cruising, geological, geophysical, archeological, paleontological, and cadastral surveys.

Agency/Type of Action	Categorical Exclusions
	<ul style="list-style-type: none"> ▪ Establishment of non-disturbance environmental quality monitoring programs and field monitoring stations including testing services. ▪ Actions where BIA has concurrence or co-approval with another Bureau and the action is categorically excluded for that Bureau. ▪ Approval of an Application for Permit to Drill for a new water source or observation well. ▪ Approval of leases, easements, or funds for single-family homesites and associated improvements, including but not limited to, construction of homes, outbuildings, access roads, and utility lines, which encompass five acres or less of contiguous land, provided that such sites and associated improvements do not adversely affect any tribal cultural resources or historic properties and are in compliance with applicable federal and tribal laws.

Reference: Council on Environmental Quality. 2020. Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act. Federal Register. Vol 85, No. 137. July 18, 2020

Appendix D - Land Use Development Analysis Process

Appendix Table D-1. Land Use Development Analysis Process

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Hydrology Resource Protection	tanks, windmills, wells	0.5	Data collected from an Ecosphere/WHPacific project. 2017-2018	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	wells	0.5	Navajo Nation water wells data	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	seeps, springs	0.5	feature called "EES_FBFA_Springs_Seeps" from I:\Projects\Government\BIA\Bennett Freeze IRMP EIS\GIS\Engineering Analysis\Data\FBFA_Springs_Seeps gdb_fromEES_20170621\EES_FBFA_SpringsSeeps. gdb. EXCLUDING from analysis the ones marked "non-existent"	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and TCPs, and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Hydrology Resource Protection	wetlands	0.25	NWI data downloaded 7/7/20 from https://www.fws.gov/wetlands/Data/Mapper.html . Data source vintage 12/6/2019. Excluded "Riverine" features from analysis.	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and TCPs, and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Hydrology Resource Protection	National Hydrography Dataset	0.25	EES_Hydro_ResourceProtection	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Biological Preserve	NN Resource Conservation Areas		Feature class called "NN_RCP_CLIP_FBFA". Original data: feature class "NNDFW_WildlifeAreas_Sensitivity" in G:\base_data\govt_agency\Navajo Nation\NavajoNation.gdb	Conservation Area	These areas were derived to protect resources such as threatened or endangered species, cultural resources and traditional cultural properties (TCPs), and Navajo-Hopi Intergovernmental compact areas, as well as protect water quality in streams and other water sources
Highway	Hwys 89, 160, 64, 264	0.25	In Transportation Dataset, feature class called "NAVTEQ_mroads_2012 Q2_4Corners"	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.
Road	BIA 6110, 20, 21	0.25	In Transportation Dataset, feature class called "NAVTEQ_streets_2012 Q2_4Corners"	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.
Population Center	Tuba City: 5 Cameron, Bodaway Gap: 2 Tonalea: 3	Variable	Census data (see change log)	Development Focus Area	These areas include corridors along primary and secondary highways and roads where development is proposed or expected to occur and include communities such as Cameron and Tuba City that are expected to expand.

Constraint /Feature	Details of Constraint/ Feature	Buffer (mi)	Data Source	Resource Area	Description of Resource Area
Abandoned Uranium Mines		0.25	EPA, via email to Joey 5/16/19	Restricted Development Area	These areas include abandoned uranium mines or other safety hazards where development or agriculture is discouraged.
Land Use Restriction	Floodplain	0	Navajo Nation Floodplain data	Restricted Development Area	These areas include abandoned uranium mines or other safety hazards where development or agriculture is discouraged.