APPENDIX D

Part IV
Social Impacts from the Navajo-Gallup Water Supply Project

SOCIAL IMPACTS FROM THE NAVAJO – GALLUP WATER SUPPLY PROJECT

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A. EXECUTIVE SUMMARY

This report discusses the social impacts associated with the Navajo-Gallup Water Supply Project. The report addresses impacts on three groups of people, the Navajo Nation, the City of Gallup and the Jicarilla Apache Nation. The types of social impacts addressed include (1) Community cohesion, (2) Accessibility to water, (3) Public health, (4) Employment impacts, (5) Demand for local services, and (6) Environmental Justice issues.

The Project should have strong positive effects on the Accessibility to water and Public health categories, and positive effects on Employment and Environmental Justice categories. If Project jobs are filled predominantly by new arrivals to the area there may be a minor negative impact on the Demand for local services. Project employment may increase construction sector employment by somewhat more (166%) than the standard deviation in that sector, but total Project-related employment (including secondary employment) will not represent an unusual fluctuation in the area's year-to-year total employment. We did not identify any significant impact on Community Cohesion.

B. COMMUNITY COHESION

For purposes of this report "Community Cohesion" refers to interactions among people and groups within a community[1] and may be affected to the extent that a project interferes with those interactions or introduces stress into the social patterns within a community. A project could interfere with community interactions by physically displacing people, by creating physical or aesthetic barriers that disrupt established patterns, or by creating a divisive debate about the advisability of the project.

The Navajo-Gallup Water Supply Project will consist primarily of buried pipelines, community storage tanks and two water treatment plants. While the pipeline route will

[1] US Department of Transportation, 1996.

transit some privately held property, most of that route is in rural areas and no residences will be displaced. Undergrounding the pipeline should preclude any barrier effect from that project aspect. The storage tanks and treatment plants are tentatively sited outside any community and should also not create barriers to community interaction.

The Project has enjoyed very strong local support among all its constituents. The Northwest New Mexico Council of Governments in conjunction with the U.S. Bureau of Reclamation held public scoping meetings early in the Project design stage at which numerous people spoke about the Project's desirability. The meetings were held in St. Michaels, AZ, and Crownpoint, Farmington, Shiprock and Gallup, New Mexico[2]. Of the 36 speakers, 19 people specifically expressed support for the Project, 3 expressed qualified support, and 3 others supported the concept of an increased water supply but did not express an opinion on the Project. Of the 36 speakers only 2 did not support the Project in some way.

All three local government bodies also have expressed their support for the Project. The Resources Committee of the Navajo Nation Council adopted a resolution supporting the PNM alignment of the Project, and the Navajo President and Vice-President have repeatedly written letters expressing the Navajo Nation's support for the Project.[3] The City of Gallup … The Legislative Council of the Jicarilla Apache Nation has cited their significant development plans for the southeast portion of their Reservation and has formally endorsed the planning effort to participate in the Navajo-Gallup Water Supply Project.[4]

Finally, the Upper Colorado River Commission, representing the Upper Basin states of Colorado, New Mexico, Utah and Wyoming, also adopted a resolution supporting the Navajo-Gallup Water Supply Project.[5]

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[2] Northwest New Mexico Council of Governments, 2000.
[3] Navajo Nation Council, Resources Committee.
[4] Jicarilla Apache Nation, 2001.
[5] Upper Colorado River Commission.

C. ACCESSIBILITY TO WATER

Accessibility to a clean, reliable water supply is considered so important that the United Nations Millennium Project cites water infrastructure as one of the key requirements to help people break out of the "poverty trap." [6] Providing a water supply is also cited as the basis for Congressional legislation in the United States. For example, the first Congressional finding in the 1996 Amendments to the Clean Water Act states that "safe drinking water is essential to the protection of public health." [7]

Some 40% of the Navajo people living in the Project service area presently have no access to piped water, and consequently haul water from sometimes distant sources.[8] Some of the water they do consume is from non-potable sources intended for stock watering and not compliant with EPA water quality standards.[9] The Project is planned to deliver a reliable supply of treated water to many of the Navajo homes that are presently without a piped water supply. Although Project plans assume that 10% of the Navajo homes presently without a piped water supply will not be served by the Project, the remainder will be.

In addition, many of the Navajo communities in the Project service area that presently do have a piped water supply rely on wells with a limited water supply. The Project will allow these communities to provide an adequate water supply to their future population and commercial needs.

The City of Gallup currently relies on groundwater pumping to supply water to its residents. The water level in Gallup wells has been falling by 7 to 29 feet per year over an extended period, and at some point the production capacity of the current well system is expected to diminish. Absent the Project, therefore, Gallup would be faced with some combination of the following scenarios: (1) development of alternative water supply

[6] UN Millennium Project, 2005, p. 39.
[7] PL 104-182, 1996, Section 3.
[8] Navajo Nation Department of Water Resources, p. ES-3.
[9] Ecosystem Management, Inc., 2004.

projects, (2) diminishing per capita water supply, and/or (3) curtailment of population growth. Gallup has not been able to identify any other water supply project that is as cost-effective as the Navajo Gallup Water Supply Project. Without new water it is estimated that the available water per capita would fall to less than one-half of existing water use by the year 2033. Thus without the Project, Gallup would have to make major changes in water use patterns, with consequential negative implications for the city's economic well-being. Accordingly, one Project impact is to prevent the overall economic losses to the City that would occur if future water shortages caused residents and businesses to locate elsewhere.

The Jicarilla Apache Nation has established a policy of developing the southwest portion of its Reservation. In order to attract the housing and commercial enterprises to that area they must develop a reliable, sustainable water supply. The Nation has no adequate local water sources capable of providing such a water supply, so they have investigated various alternatives for importing water from non-local sources. Of the alternatives investigated the Navajo Gallup Water Supply Project offers the best combination of reliability and cost-effectiveness. The effect, then, of the Project would be to facilitate the Jicarilla Nation's plans to diversify their Reservation, both residentially and economically.

D. PUBLIC HEALTH

A primary rationale for the public policy of providing clean and reliable water to all people in the United States is the resulting health benefit. As noted in the "Accessibility to Water" section, above, the 1996 Amendments to the Clean Water Act explicitly link public health to safe drinking water.[10] In addition, Congress has found specifically for Indians that a "major national goal of the United States is to provide the quantity and quality of health services which will permit the health status of Indians to be raised to the highest possible level …,"[11] and that "the provision of safe water supply systems and sanitary sewage and solid waste disposal systems is primarily a health consideration and

[10] PL 104-182, Section 3.
[11] 25 USC 1601

function," and that "it is in the interest of the United States, and it is the policy of the United States, that all Indian communities and Indian homes, new and existing, be provided with safe and adequate water supply systems… as soon as possible."[12]

There is a clear connection between sanitation facilities (water & sewerage) and Indian health. The Indian Health Service considers the availability of essential sanitation facilities to be "critical to breaking the chain of waterborne communicable disease episodes… In addition, many other communicable diseases, including hepatitis A, shigella, and impetigo are associated with the limited hand washing and bathing practices often found in households lacking adequate water supplies. This is particularly true for families that haul water."[13] The Indian Health Service reports that American Indian families living in homes with satisfactory environmental conditions required about one-fourth the medical services as those with unsatisfactory environmental conditions.[14]

The Navajo Gallup Water Supply Project will provide a safe water supply to many households who would otherwise not have it, particularly on the Navajo Reservation. As mentioned in the previous section, approximately 40% of Navajo households presently must haul water, sometimes from non-potable water sources. The Project is designed to deliver a safe, reliable water supply to most of these households, and this water supply should have a direct beneficial effect on the health of the people receiving it.

E. EMPLOYMENT IMPACTS

Project-induced change in employment opportunities could represent either a positive or negative social impact. To the extent that a project provides opportunities for employment in an area with high unemployment rates, the project can relieve social stress due to the lack of jobs. On the other hand, a project that attracts a large number of employees from outside the local area could create social tension. The degree to which

[12] 25 USC 1632
[13] Indian Health Service, 2004
[14] Ibid.

Project employment could attract a substantial influx of workers, stressing both community infrastructure and community cohesion, is addressed in the next section.

The Navajo-Gallup Water Supply Project will create jobs for both the construction and operation phases. The construction phase is expected to last some 16 years, and construction will occur in San Juan and McKinley counties in two main corridors: the western branch from the PNM diversion on the San Juan River to Gallup, with east and west branches; and the eastern branch from the Cutter diversion on the NAPI canal south to Torreon. The construction employment is estimated to average about 600 workers and peak at about 650 workers during the 3rd through 15th years of construction. The operational phase will employ about 28 full-time equivalent workers on a long term basis. The jobs for these workers will be located primarily at the water treatment plants and pumping plants, with crews monitoring and repairing the pipelines and electric transmission lines.

The San Juan – McKinley county area has experienced long-term unemployment problems, particularly among the Navajo and Jicarilla people. In recent years the overall unemployment rate in the area has exceeded the national rate by approximately 10% to 70%, while the unemployment rate among Navajo and Jicarilla people has been six to ten times the national rate. Table 1 shows the most recently available unemployment rates for the area.

Table 1

Unemployment Rates in United States and Vicinity of Navajo Gallup Water Supply Project

Year	United States	San Juan County, NM	McKinley County, NM	Navajo Reservation	Jicarilla Apache Reservation
1999	4.2%	7.5%	7.1%	34%	40%
2000	4.0%	5.8%	6.6%		
2001	4.7%	6.2%	6.2%	52%	33%
2002	5.8%	6.9%	6.2%		
2003	6.0%	7.6%	7.4%		
2004	5.5%	6.1%	7.6%		
2005	5.1%	5.5%	6.8%		
2006	4.6%	4.3%	5.6%		

Sources: National and county unemployment rates from U.S. Bureau of Labor Statistics, "Local Area Unemployment Statistics;" Reservation unemployment rates from U.S. Bureau of Indian Affairs, "American Indian Population and Labor Force Report," 1999 and 2001.

To the extent that the construction and operation jobs can be filled by currently unemployed local people, the Project should represent an important benefit to the local area's socioeconomic condition. The Water Resources Council's Principles and Guidelines conclude that in an area of substantial and persistent unemployment a local hire rule can increase the percent of jobs going to otherwise unemployed people from 30% to 43% in the case of skilled workers, and from 47% to 58% in the case of unskilled workers.[15] In either event the Project should result in a significant number of jobs for otherwise unemployed people.

F. DEMAND FOR LOCAL SERVICES

Although many Project workers may be hired from the local population base, some other workers may be attracted from outside the area. If the number of immigrants is sufficiently large, it may have negative effects on both community infrastructure and on community social fabric.

During the construction phase the Project will support two types of additional employment in the region. First, the Project will require several hundred construction workers to build the water treatment plants, pipeline, storage tanks, pumping plants and electrical transmission lines. Second, the income earned by Project construction workers will stimulate local spending on goods and services, adding more jobs primarily to the retail and service sectors. Table 2 shows an estimate of the jobs added in the construction sector and in all sectors (including construction) during each year of construction. The numbers of new construction and new total jobs were estimated using an IMPLAN input-output model that links a change in employment to an initial change in spending (in this case, Project construction spending).[16] Table 2 also shows an estimate of the baseline construction and overall employment that would exist in the absence of the Project.

[15] U.S. Water Resources Council, p. 94.
[16] IMPLAN

Future overall employment was estimated by extending the 1999-2003 trend in overall employment into the future. Construction employment has been declining over the 1999-2003 period. For purposes of this analysis we assumed that the decline will halt and in the absence of the Project, future construction employment would stabilize at the 2003 level.

Table 2

Baseline and Project-Related Additional Employment

McKinley and San Juan Counties, New Mexico

Year	Baseline Construction Employment	Additional Project-Related Construction Employment	Baseline Total Employment	Additional Project-Related Total Employment
1999	5,124		62,261	
2000	4,554		62,097	
2001	4,477		64,377	
2002	4,142		65,441	
2003	4,187		66,000	
2004	4,187		67,282	
2005	4,187		68,364	
2006	4,187		69,446	
2007	4,187		70,528	
2008	4,187		71,611	
2009	4,187		72,693	
2010	4,187		73,775	
2011	4,187	181	74,857	346
2012	4,187	357	75,939	682
2013	4,187	653	77,022	1247
2014	4,187	653	78,104	1247
2015	4,187	653	79,186	1247
2016	4,187	653	80,268	1247
2017	4,187	653	81,350	1247
2018	4,187	653	82,433	1247
2019	4,187	653	83,515	1247
2020	4,187	653	84,597	1247
2021	4,187	653	85,679	1247
2022	4,187	653	86,761	1247
2023	4,187	653	87,844	1247
2024	4,187	653	88,926	1247
2025	4,187	653	90,008	1247
2026	4,187	380	91,090	725

Source: U.S. Bureau of Labor Statistics, "State and County Employment and Wages from the Quarterly Census of Employment and Wages;" IMPLAN; Dornbusch Associates.

Table 2 shows the future estimated baseline (without Project) employment and the Project-related increase in employment for the construction sector and for total employment. The significance of these increases is a remaining question. As the actual employment data for 1999-2003 in Table 2 show, employment can vary considerably from year to year. Using the data for 1999-2003 we calculate standard deviations for both construction and total employment. This measure indicates the expected variability in employment from year to year. So long as the annual employment numbers are "normally" distributed, we would expect the annual numbers to be within one standard deviation of the mean about two-thirds of the time. Table 3 shows the annual Project-related employment as a percent of one standard deviation.

Table 3

Project-Related Construction and Total Employment as a Percent of One Standard Deviation, McKinley and San Juan Counties, New Mexico

Year	Project-Related Construction Employment / Standard Deviation	Project-Related Total Employment / Standard Deviation
2011	46%	19%
2012	91%	38%
2013	166%	70%
2014	166%	70%
2015	166%	70%
2016	166%	70%
2017	166%	70%
2018	166%	70%
2019	166%	70%
2020	166%	70%
2021	166%	70%
2022	166%	70%
2023	166%	70%
2024	166%	70%
2025	166%	70%
2026	97%	40%

Table 3 shows that the Project-related total employment change is estimated to be within one standard deviation of the baseline employment. On the other hand, the Project-related construction employment is estimated to exceed one standard deviation from the

baseline employment. If the distribution of annual construction employment follows a normal distribution, an increase the magnitude of Project-related construction employment would only be expected to occur in about one year in ten. However, the Project-related construction employment does not reach this peak level until the third year of construction; the biggest year-to-year change in Project-related construction employment is well within the one standard deviation benchmark. Figures 1 and 2 show graphically how the Project-related construction and total employment, respectively, compare to expected baseline employment during the construction phase. The error bars around the baseline employment numbers represent plus and minus one standard deviation from the mean number.

Figure 1
Project Construction Employment Impact
Navajo-Gallup Water Supply Project
San Juan and McKinley Counties, NM

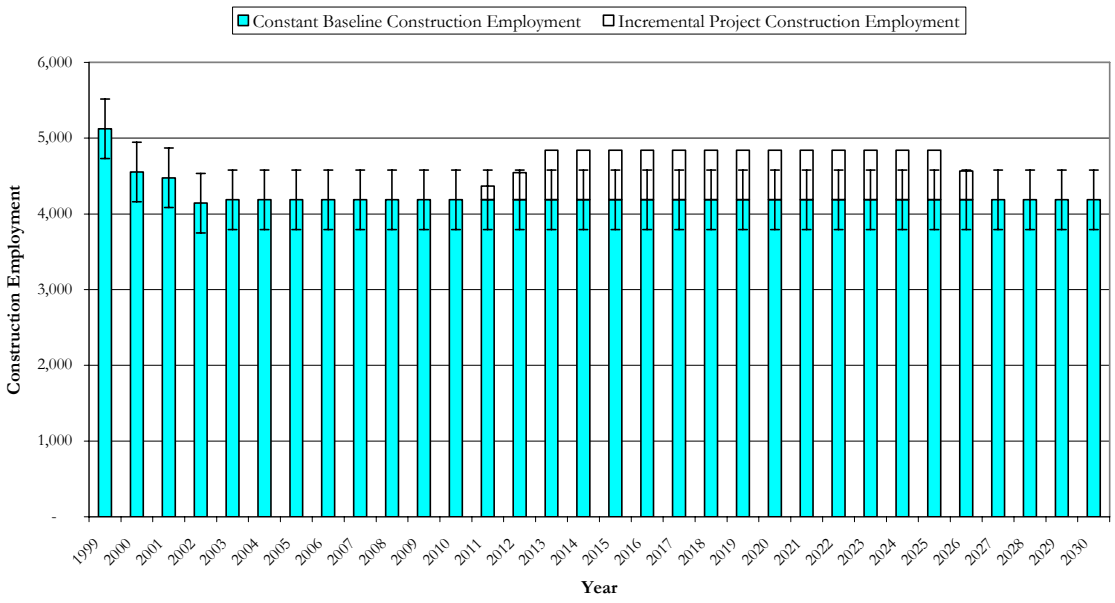
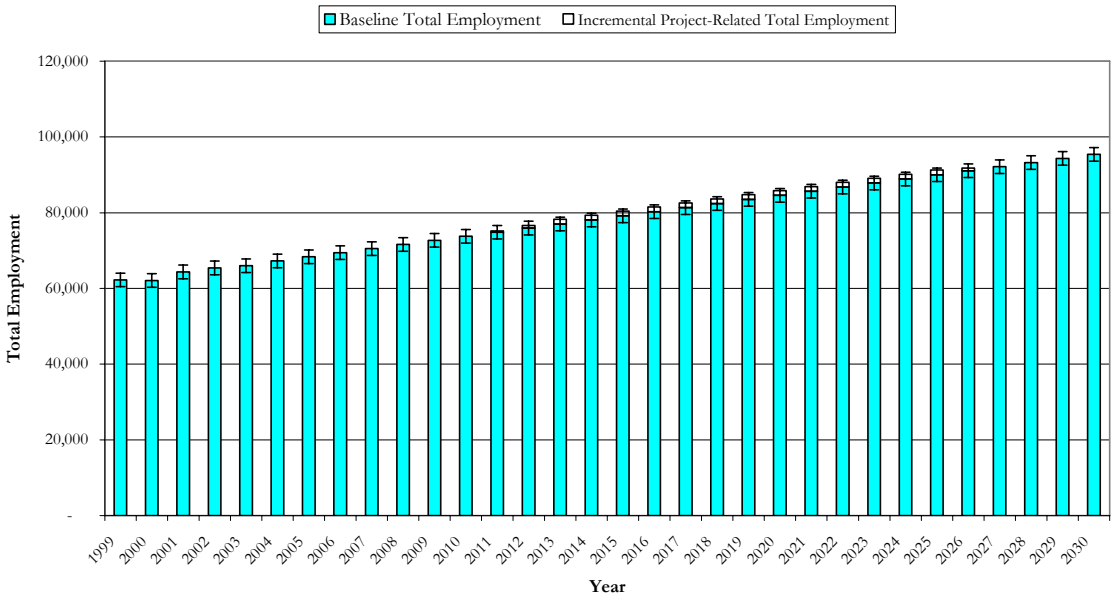


Figure 2
Project-Related Total Employment Impact
Navajo-Gallup Water Supply Project
San Juan and McKinley Counties, NM



The changes shown in Table 3 represent a worst case possibility. To the extent that the construction industry and other sectors hire local people who were otherwise unemployed these jobs will be filled by people who will not add substantially to the demand for local services and infrastructure. For example, these local people may already have housing and their children may already attend local schools. As discussed in the previous section, the U.S. Water Resources Council suggests that in an area with persistent and substantial unemployment some 30% to 58% of the construction workforce will come from the pool of unemployed workers. The number depends partially on whether the jobs are skilled or unskilled and on the presence of a local hire rule.[17]

The Project operation will require operators and maintenance personnel. Based on the IMPLAN model we estimate that about 83 workers will be needed, of which about one-third will be directly working on the Project, one-third working for businesses that supply goods and services to the Project, and the remaining one-third working for businesses that provide goods and services to Project employees and employees of the businesses

[17] U.S. Water Resources Council, p. 94.

supplying the Project. Sixty-six employees represents about one-tenth of one percent of total area employment. This level of employment should not have more than a minor impact on the area's infrastructure and services.

G. ENVIRONMENTAL JUSTICE

The Environmental Justice issue is essentially one of discrimination against specific subpopulations. Executive Order 12898 directs that federal programs, policies and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations.[18]

Substantial populations in the Project area clearly qualify as minority and low-income. The 2000 Census of Population reports that 74.7% of the 74,798 people in McKinley County and 36.9% of the 113,801 people in San Juan County are American Indians.[19] The 2000 Census also shows that both the Navajo people ($21,830) and Jicarilla Apache people ($26,667) in New Mexico earn median incomes far below the New Mexico state average ($34,133).[20]

No major adverse impacts from the Project have been identified, and there is no indication that any adverse impacts would have a disproportionate effect on the minority and low-income populations.

Conversely, the beneficial effects from providing water to those who would otherwise have to haul water will accrue *primarily* to the minority and low-income populations. This access to water benefit and the related health improvements are discussed in earlier sections of this report. These important positive Project impacts will assist rather than harm the minority and low-income populations.

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[18] Presidential Executive Order 12898.
[19] US Census Bureau, Quick Facts McKinley County and US Census Bureau, Quick Facts San Juan County.
[20] US Census Bureau, Characteristics of American Indians.

In addition to the positive water accessibility and related health benefits to the minority and low-income populations, the Project will have an additional beneficial impact by increasing the attractiveness of the area for economic development. The Project will provide a water infrastructure essential for many businesses. The water provided by the Project will assist the City of Gallup in retaining existing businesses and attracting new ones, and will assist the Navajo Chapters and the Jicarilla Apache Nation in attracting businesses that would not otherwise be interested in investing in the area.

Finally, the Project may indirectly help reduce the outmigration of Navajo people. The improved economic climate facilitated by the Project will provide more employment opportunities for the minority and low-income populations. This increased employment opportunity, together with an improved water infrastructure, will make the area more attractive for young adults who might otherwise consider moving outside the area.

According to Census Bureau data the population of the Navajo Nation grew by 32.4% between 1990 and 2000, from 225,298 to 298,197 people [U.S. Census Bureau, 1995; U.S. Census Bureau, 2002]. In contrast, the number of Navajo people residing on the Navajo Reservation or Trust Lands increased only 21.6% [U.S. Census Bureau, "American Factfinder;" U.S. Census Bureau, "American Indian Reservations and Trust Lands"]. This disparity indicates that the number of Navajo people residing off-Reservation increased by 53.2%, or over 40,000 people.

The Navajo tribal statistician noted this trend of Navajo outmigration in the 1996 "Chapter Images" profile of Navajo communities [Navajo Division of Community Development, 1997, p. vii]. The statistician attributed the trend to "development stagnation" on the Reservation [Ibid.]. Another factor contributing to the outmigration, however, may be the low standard of living due to primitive water supply conditions. About 40% of Navajo families have no piped water supply and must haul water from a central source to their dwellings. As noted in the section discussing health benefits, above, water hauling is not only expensive and inconvenient but also contributes to health problems for families who haul water.

Section E, above, discussed the likelihood that the Navajo Gallup Water Supply Project would stimulate the regional economy. This increased economic activity should provide additional long-term employment opportunities for all people in the Project service area, including those on the Navajo Reservation. In addition, the provision of a piped water supply will raise the standard of living in the Project area, providing clean, reliable water at a price much less than the cost of water hauling. The increased opportunity for increased economic well-being, in addition to the convenience afforded by a reliable source of clean piped water, should substantially reduce the outmigration of Navajo people.

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