Medicine Bow Fuel & Power, LLC

Medicine Bow Coal-to-Liquids Project Socioeconomic Impact Analysis

Final Report

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Prepared by

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Acronym List

AASHTO	American Association of State Highway and Transportation Officials
AADT	annual average daily traffic
CBM	coal bed methane
CIP	Capital Improvement Plan
DOE	Department of Employment
EPC	Engineer-Procure-Construct
ES	elementary school
FEIS	Final Environmental Impact Statement
FTE	Full-time Equivalent
FIRE	finance, insurance, and real estate
GIS	Geographic Information System
HUD	U.S. Department of Housing and Urban Development
LOS	level of service
MFI	median family income
MS	middle school
PK	pre-kindergarten
sf	square feet
SHWD	Solid and Hazardous Waste Division
SWTSD	solid waste treatment, storage, and disposal
WIDISA	Wyoming Industrial Development and Siting Act
WYDOT	Wyoming Department of Transportation

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SECTION 1.0

Introduction

1.1 Project Overview

This socioeconomic analysis is provided in support of the preparation of a complete Wyoming Industrial Development Information and Siting Act (WIDISA) Section 109 permit application for a proposed coal to liquids project and to assist Medicine Bow Fuel & Power in obtaining permit approval through the Wyoming Industrial Siting Council.

Medicine Bow Fuel & Power is proposing to construct a coal to liquids facility in Carbon County south of Medicine Bow. Construction of the plant will begin in 2008 with commercial operation in early 2012. The plant will produce up to 20,000 barrels per day of transportation fuel and associated energy products and could be expanded in the future.[1] It is estimated that employment will range from a high of 2,000 workers for the coal to liquids plant and 307 workers for the coal mine during construction. During operation it is estimated that the plant will require up to 200 workers for the coal to liquids plant and up to 250 workers for the coal mine. The total construction cost for the coal to liquids plant and coal handling operations is approximately 2.0 Billion U.S. Dollars.

This analysis will evaluate the benefits and impacts to social and economic resources in the study area, including the benefits related to:

- The tax structure
- Employment opportunities
- Indirect employment benefits (jobs created in relationship to the primary construction employment)

The analysis of the impacts includes the effects on the following:

- Housing
- Educational facilities
- Public safety and security
- Health resources
- Municipal services
- Transportation systems

1.1.1 Project Location and Area Map

The project would be located in Carbon County, Wyoming. Figure 1-1 displays the location of the site preferred by Medicine Bow Fuel & Power. As the figure shows, the potential location is approximately 10 miles southwest of Medicine Bow.

[1] The exact output quantity will not be known until after detailed engineering is complete.

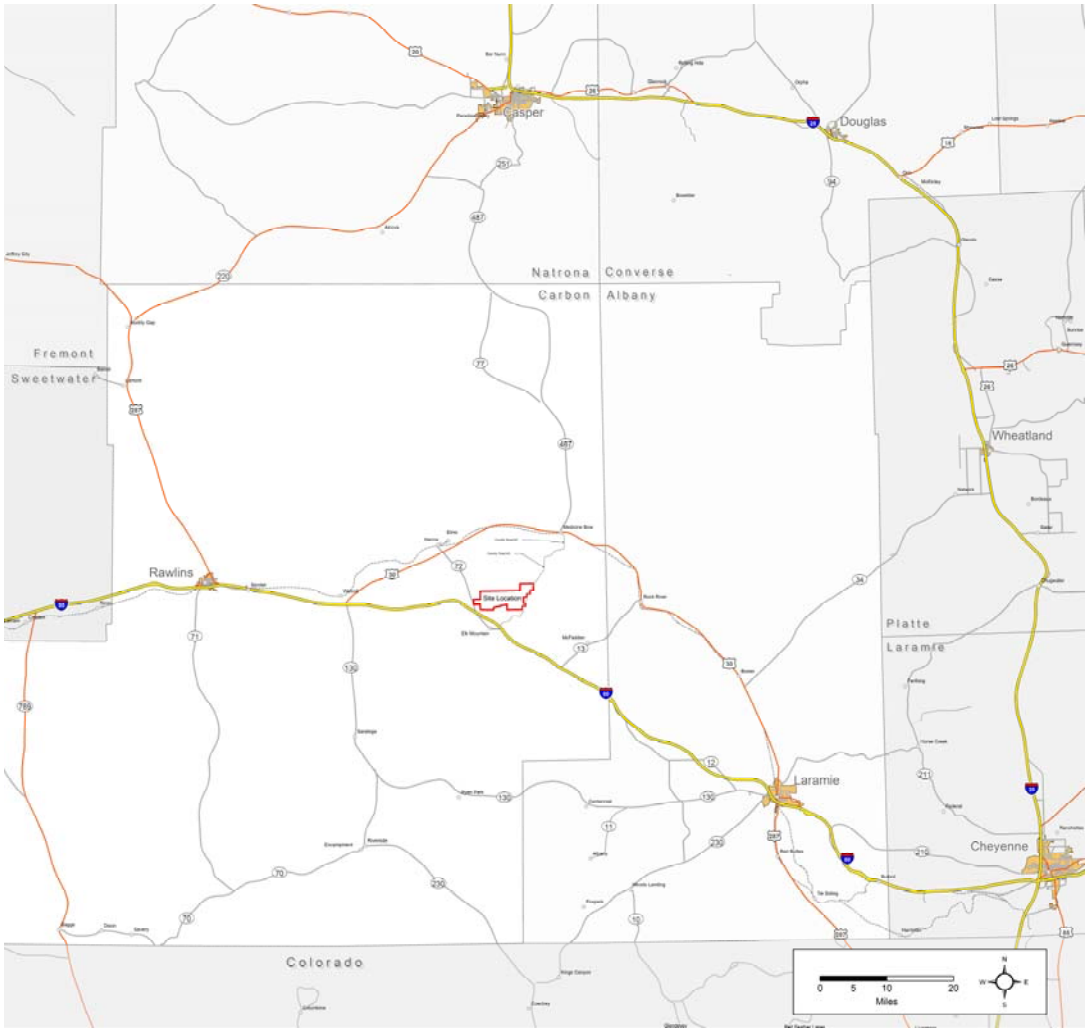

FIGURE 1-1
Site Location

1.2 Purpose of the Socioeconomic Analysis

The purpose of the socioeconomic analysis is to analyze impacts to communities affected by the siting of industrial facilities and to provide information to the Industrial Siting Council regarding socioeconomic impacts and associated mitigation measures.

1.2.1 Comparison of Expected Future Conditions and Project Conditions

The analysis includes an assessment of the baseline conditions (without the project) in a larger area of influence called the "study area" and the impacts of the project in a narrower geographic region called the "Area of Impact."

This analysis will compare the existing conditions in the study area and the anticipated future conditions in the Area of Impact without the project to the anticipated future conditions in the Area of Impact with the project. By making this comparison, the relative impact related to the project can be assessed.

1.3 Methodology

The methodology for the socioeconomic impact analysis includes a description of the existing and future conditions in the study area and the identification of the capacity of the resources involved. Capacities of the resources involved include the identification of existing standards for carrying capacities and the numbers of persons currently served. For example, to identify the capacity of the school system, current enrollment was identified, student-teacher ratios were calculated, and these ratios were compared to acceptable student-teacher ratios to identify any anticipated shortages or excess capacity of resources within the school system.

Impacts are then based on the numbers of additional workers/families that these resources will likely need to serve, and whether the systems in place or the anticipated expanded systems in the future (based on current plans to expand) will be able to satisfy the anticipated demand created by the project. If the resources are unlikely to meet these new demands, then mitigation measures are proposed.

1.3.1 Study Area and Area of Impact Defined

The methodology for the socioeconomic impact analysis involves the description of the general baseline conditions in the four-county study area surrounding the site, which comprises the following counties:

- Albany
- Carbon
- Natrona
- Sweetwater

These counties were identified early in the analysis as having the potential for workers to relocate there in order to commute to work on the site in Carbon County. This was based on census information regarding the most likely counties from which workers commute to work in Carbon County (Census 2000). However, it is important to note that 90 percent of Carbon County's workforce presently resides in Carbon County; therefore, commuting into Carbon County for job opportunities is relatively rare. Table 1-1 displays the number and percentage of workers commuting in the study area.

TABLE 1-1
Current Commuting into Carbon County for Employment

Albany		Carbon		Natrona		Sweetwater		Rest of Wyoming		Other States	
#	%	#	%	#	%	#	%	#	%	#	%
52	0.7%	6,791	90%	123	1.6%	91	1.2%	186	2.5%	315	4.2%

Source: Census 2000, Journey to Work

Because commuting into Carbon County from other counties is relatively uncommon, and in order to reduce or eliminate impacts to the larger study area, the decision was made that the most prudent course would be to assume that the majority of the temporary workers and their families will reside within Carbon County. While this would place a greater

burden on project sponsors to consider and assist potentially with increased local housing needs, this approach would minimize impacts to other counties in the study area. Therefore, within this study, the primary Area of Impact was defined as Carbon County; however, consistent with existing commuting patterns to work, it is recognized that a Secondary Area of Impact would exist.

1.3.2 Socioeconomic Analysis Steps

The process for the socioeconomic analysis is presented in Figure 1-2.

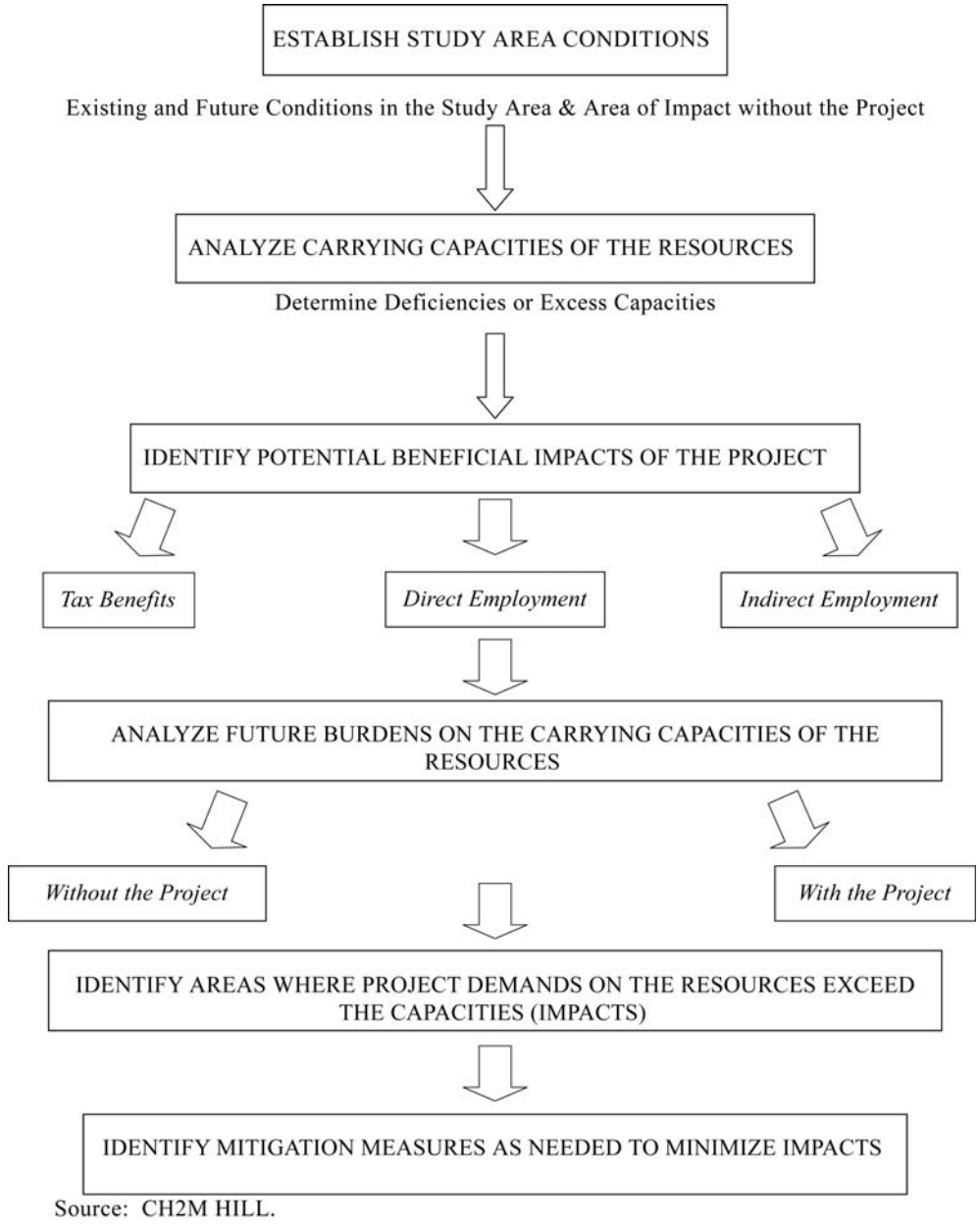

FIGURE 1-2
Socioeconomic Study Process

1.4 Contents of this Analysis

The following section presents the baseline conditions in the four-county study area by resource. This is followed by the impact analysis focused on the Primary Area of Impact, a trade-off analysis (which discusses benefits as compared to impacts), and finally a recommended mitigation section.

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SECTION 2.0

Study Area Conditions

2.1 Study Area Defined

The area surrounding the proposed project site in Carbon County, which is described as the study area for purposes of description of the baseline conditions, includes Albany, Carbon, Natrona, and Sweetwater Counties, as shown on Figure 2-1.

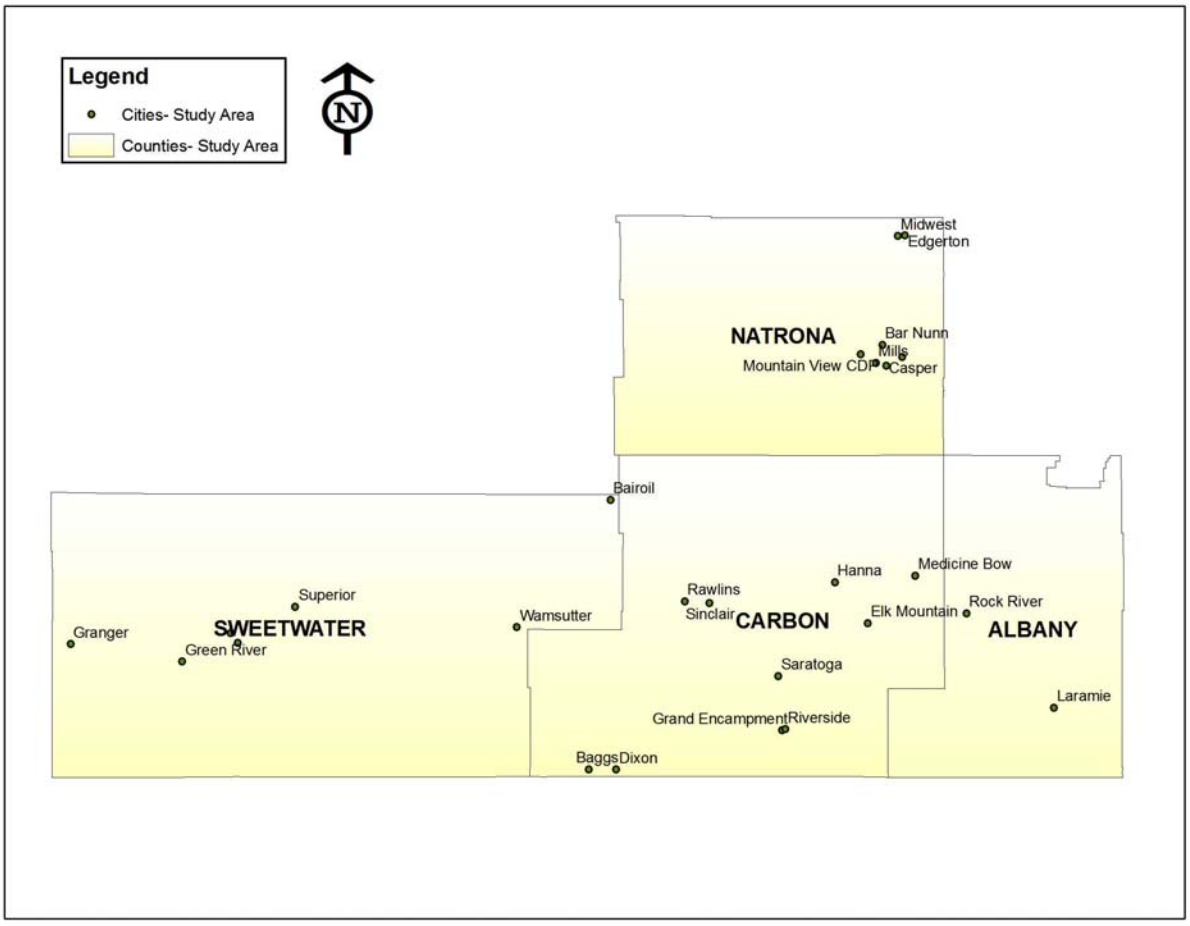

FIGURE 2-1
Study Area

2.2 Population

2.2.1 Past and Present Population

The most salient features of the past and present population in the study area are presented in the following section. The population factors that will be the most important in determining the location and availability of the local labor force include the location of the population centers and the age distribution of the population (i.e., the identification of areas where work-age persons reside). Future forecasts presented are for the years 2008 and 2011 because these years coincide with the anticipated start and end of mechanical construction for the project. The project is expected to be in commercial operation in mid 2012.

2.2.1.1 Past Population Trends

Natrona County experienced the most dramatic population increase in the study area during the period from 1920 to 2000. While the number of residents in Albany, Carbon, and Sweetwater Counties has also grown, Natrona County has registered the largest growth, increasing from 14,635 persons in 1920 to 66,533 residents in 2000. Between 1920 and 2000, Natrona County had the largest population in the four-county area. Carbon County experienced the lowest population increase in the study area, increasing from a 1920 population of 9,525 to 15,639 residents in 2000.

Table 2-1 displays population by county from 1920 to 2000.

TABLE 2-1
Population Trends in the Study Area

County	1920	1930	1940	1950	1960	1970	1980	1990	2000
Albany	9,283	12,041	13,946	19,055	21,290	26,431	29,082	30,797	32,014
Carbon	9,525	11,391	12,644	15,742	14,937	13,354	21,896	16,659	15,639
Natrona	14,635	24,272	23,858	31,437	49,623	51,264	71,856	61,226	66,533
Sweetwater	13,640	18,165	19,407	22,017	17,920	18,391	41,723	38,823	37,613
Total	**47,083**	**65,869**	**69,855**	**88,251**	**103,770**	**109,440**	**164,557**	**147,505**	**151,799**

Source: State of Wyoming, Department of Administration and Information, Economic Analysis Division, 2004.

The dramatic growth in Natrona County occurred in the decades from 1920 to 1930 and again from 1950 to 1960. Natrona County's population grew 66 percent from 1920 to 1930 and 58 percent from 1950 to 1960. Sweetwater County saw dramatic growth in population from 1970 to 1980, when the number of residents in the county rose 127 percent. Albany and Carbon Counties, meanwhile, have seen very modest growth (or slight declines) in population from 1920 to 2000. However, in 1980, Carbon County posted a significant 60 percent increase in population. The years from 1920 to 1930, 1940 to 1950, and from 1970 to 1980 mark the only decades in which all of the counties in the study area registered population increases. The growth in population from 1970 to 1980 is generally attributed to the energy boom occurring during that decade. Changes in population from 1990 to 2000 for the study area counties have been varied. Albany and Natrona Counties both experienced a

slight increase in population while Carbon and Sweetwater Counties declined slightly. Overall, population growth in the study area from 1920 to 2000 has more than tripled.

Albany County saw an increase in population from 1920 to 2000. Although the population increases from 1920 to 1950 varied from 16 to up to 37 percent; since 1970 population increases have slowed from 10 to 4 percent.

The population of Carbon County had increasing populations from 1920 to 1950; however, it had decreased from 1950 to 1970. In the time period from 1970 to 1980, Carbon County saw a dramatic increase in the population of 64 percent. In the decade of 1980 to 1990 and up to 2000, the population of Carbon County had decreased by 24 percent and 6 percent, respectively.

Natrona County experienced growth in population of 66 percent from 1920 to 1930, then the population decreased by 2 percent the next decade (Table 2-2). From 1950 to 1960 and 1970 to 1980, Natrona County experienced significant increases in population of 58 and 40 percent. Although the population decreased by 15 percent from 1980 to 1990, it experienced an increase of 9 percent from 1990 to 2000.

Sweetwater County saw increases in population from 1920 to 1950, then a decrease of 15 percent in the decade of 1950 to 1960. From 1970 to 1980, Sweetwater County experienced significant growth, with the population increasing by 127 percent. From 1980 to 2000, the population has decreased from 7 to 3 percent.

Overall, the study area has seen modest growth, with some decline in population from 1920 to 1950 and from 1970 to 1990, while experiencing the most dramatic growth from 1970 to 1980 and slight decreases between 1990 and 2000.

TABLE 2-2
Percent Growth by County by Decade

County	1920 to 1930	1930 to 1940	1940 to 1950	1950 to 1960	1960 to 1970	1970 to 1980	1980 to 1990	1990 to 2000
Albany	30	16	37	12	24	10	6	4
Carbon	20	11	25	-5	-11	64	-24	-6
Natrona	66	-2	32	58	3	40	-15	9
Sweetwater	33	7	13	-19	3	127	-7	-3
Total Study Area	**149**	**32**	**107**	**46**	**19**	**241**	**-40**	**4**

Source: State of Wyoming, Department of Administration and Information, Economic Analysis Division, 2004.

2.2.1.2 Present Population

Density and Location of the Population

Of the four counties in the study area, Albany, Natrona, and Sweetwater Counties currently account for 90 percent of the total population, with totals of 32,014, 66,533, and 37,613 residents, respectively.

The population in the study area is distributed near the major cities as shown on Figure 2-2.

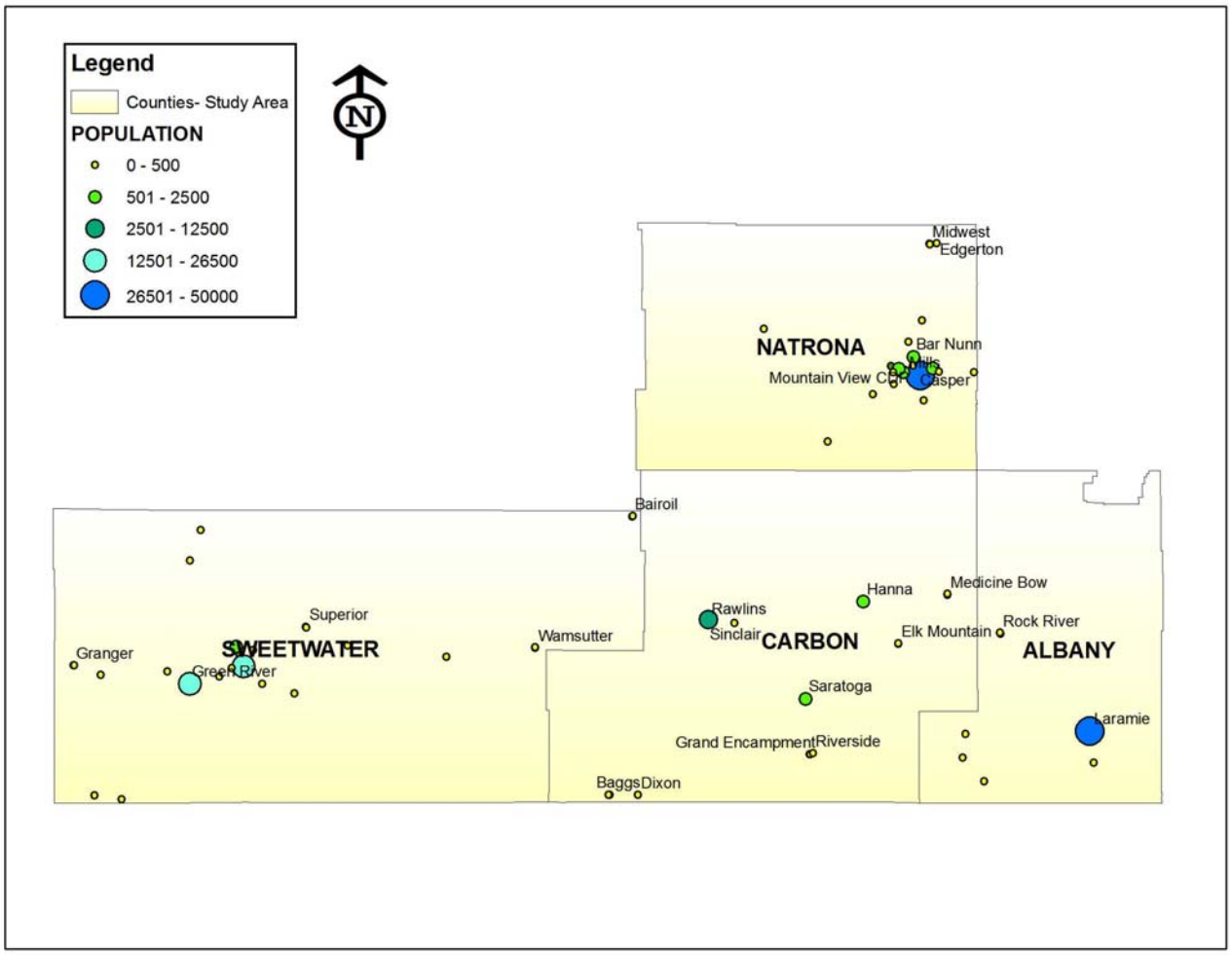

FIGURE 2-2
Existing Distribution of Study Area Population

The 2000 population, number of households, and average household size of the 24 cities in the study area are displayed in Table 2-3.

With a 2000 census population of 49,644, Casper is the largest city in the study area, followed by Laramie, Rock Springs, Green River, and Rawlins. The average household size in the study area is 2.34 persons per household. More than 84 percent of the population lives in the 24 cities and census-designated places contained in the study area.

TABLE 2-3
Existing Population, Households, and Average Household Size in the Study Area, 2000

City	Population	Number of Households	Average Household Size
Albany County			
Laramie	27,204	11,336	2.19
Rock River	235	94	2.50
Carbon County			
Baggs	348	147	2.37
Dixon	79	41	1.93
Elk Mountain	192	74	2.59
Encampment	443	NA	NA
Hanna	873	367	2.38
Medicine Bow	274	129	2.12
Rawlins	9,006	3,320	2.45
Riverside	59	28	2.11
Saratoga	1,726	757	2.23
Sinclair	423	168	2.52
Natrona County			
Bar Nunn	936	315	2.97
Casper	49,644	20,343	2.38
Edgerton	169	74	2.28
Evansville	2,255	848	2.66
Midwest	408	149	2.74
Mills	2,591	1,161	2.23
Sweetwater County			
Bairoil	97	42	2.31
Granger	146	54	2.70
Green River	11,808	4,177	2.80
Rock Springs	18,708	7,348	2.48
Superior	244	92	2.65
Wamsutter	261	100	2.54

Source: U.S. Census Bureau, 2000.

Age of the Population

Table 2-4 compares the existing population, by age, in the study area counties and Wyoming. The age distribution in the study area counties is consistent with the age distribution for Wyoming as a whole. The one exception is Albany County, which had a higher percentage of the age cohort from 20-34 and a lower percentage of the age cohort from 35-59.

TABLE 2-4
Year 2000 Population in Wyoming and Study Area Counties by Age and Age Cohort Percent of the Total

Geographic Area	Age Group						
	0 to 9	10 to 19	20 to 34	35 to 59	60 to 74	75+	Total
Wyoming	65,067	80,279	93,309	177,779	50,998	26,350	493,782
Percent of Total Population	13	16	19	36	10	5	
Albany County	3,205	5,248	11,056	8,911	2,354	1,240	32,014
Percent of Total Population	10	16	35	28	7	4	
Carbon County	1,852	2,341	2,708	6,131	1,753	854	15,639
Population Percent of Total	12	15	17	39	11	5	
Natrona County	8,933	10,622	12,497	23,470	7,306	3,705	66,533
Percent of Total Population	13	16	19	35	11	6	
Sweetwater County	5,422	6,801	6,950	14,230	2,800	1,410	37,613
Percent of Total Population	14	18	18	38	7	4	

Source: State of Wyoming, Department of Administration and Information, Economic Analysis Division, 2004.

Migration of the Population

Total population change is a combination of births, deaths, and net migrations (those coming into and leaving the area). The Wyoming Department of Transportation (WYDOT) tracks drivers moving into the state from other areas and those surrendering in-state driver's licenses when moving to a new out-of-state location. While these numbers are not a precise measure of migration (because they represent only those with licenses and those who exchange their license in a timely manner), they provide general information about the extent and direction of migration. This information was reported in *A Profile of Wyoming Demographics, Economics and Housing, Semiannual Report, Ending December 31, 2006,* (Wyoming Housing Database Partnership, February 2007).

In general, the in-flows of new driver's licenses fell by 13.8 percent from 2002 to 2003, indicating decreased in-migration to the state. However, the age groups from 26 to 55 years old accounted for the greatest amount of the in-migration in 2002 and 2003. This trend

continued into 2004, where net in-flow again decreased. There were 4,010 new driver's licenses in 2002 compared to 2,075 in 2004. Again, the age groups from 26 to 55 years old accounted for the greatest influx in 2004, accounting for nearly 88 percent of the total increase.

When analyzed from a county perspective, these data indicate that Wyoming's more populated areas are growing at a faster rate than the sparsely populated areas of the state. Table 2-5 displays net migration information by county for the study area (as expressed in driver's license exchanges).

TABLE 2-5
Net Migration Study Area Counties, 2000 to 2006

County	2000	2001	2002	2003	2004	2005	2006
Albany	-256	-15	160	215	-37	-16	69
Carbon	43	112	209	40	52	116	125
Natrona	-82	235	290	360	257	437	608
Sweetwater	-324	37	-15	10	198	243	711

Source: WYDOT records reported in A Profile of Wyoming Demographics, Economics and Housing, Semiannual Report, Wyoming Housing Database Partnership, February 2007.

Carbon and Natrona Counties had the highest number of in-migration of all of the counties in the study area. Only Carbon County has experienced constant net in-migration from 2000 to 2005. In general, all of the counties have experienced more in- than out-migration.

2.2.2 Future Population

It is important to estimate future population growth in the study area to assist in the determination of the effects of the additional population created as a result of the construction and operation of the facility. Construction is anticipated to occur from 2008 to 2011. Therefore, future baseline population estimates will focus on the period from 2000 to 2011.

2.2.2.1 Population Projections

Future population projections for the study area show slow growth in Natrona and Sweetwater Counties, and little to no growth in Albany and Carbon Counties. Table 2-6 displays the existing and future population projections for the study area.

TABLE 2-6
Future Baseline Population Projections in the Study Area (Without the Project)

County	2000	2008 Projection	2011 Projection	% Increase 2000 to 2008	% Increase 2008 to 2011	Average Annual Projected Percent Increase 2000 to 2011
Albany	32,014	31,200	31,490	-2.5	0.9	-1.6
Carbon	15,639	15,560	15,720	-0.5	1.0	0.5
Natrona	66,533	72,770	75,300	9.4	3.5	13.2
Sweetwater	37,613	40,260	41,900	7.0	4.1	11.4

Source: State of Wyoming, Department of Administration and Information, Economic Analysis Division

Natrona and Sweetwater Counties are projected to grow at an average annual rate of 13.2 and 11.4 percent, respectively. Carbon County is projected to grow at an average annual rate of 0.5 percent. Albany County is anticipated to decline at an average annual rate of -1.6.

2.3 Economic Conditions

2.3.1 Past and Present Economic Conditions

In 2002, the majority of Wyoming's workforce was employed in the following sectors: education, health, and social services (19 percent); agriculture, forestry, fishing/hunting, and mining (12 percent); retail trade (11 percent); leisure and hospitality (10 percent); and construction (9 percent).

The remaining 38 percent of the state's workforce was spread across the remaining industries, ranging from 6 to 7 percent in professional and business services and public administration; 5 percent in transportation, manufacturing and finance, insurance, and real estate; and 2 to 3 percent in wholesale trade and information.

Employment in the study area is heavily focused in the following sectors:

- Governmental services (19 percent)
- Retail trade (12 percent)
- Health care/social assistance (8 percent)
- Accommodation/food services (8 percent)

The economic conditions in the study area are described in the following sections.

2.3.1.1 Existing Economic Conditions

Labor Force

The total labor force (those able to work) in the four counties of the study area totaled 92,507 in 2006. Of these, 89,479 were actually employed, representing an unemployment rate of slightly higher than 3 percent.

Table 2-7 displays the labor force in the study area by county.

TABLE 2-7
Study Area Labor Force, 2006

County	Labor Force	Employed	Unemployed	Unemployment Rate
Albany	20,045	19,406	639	3.2%
Carbon	7,836	7,515	321	4.1%
Natrona	41,103	39,760	1,343	3.3%
Sweetwater	23,523	22,798	725	3.1%
Total	**92,507**	**89,479**	**3,028**	

Source: Wyoming Department of Employment (DOE), Research and Planning, 2006.

Natrona County has the largest labor force with 41,103 able workers, followed by Sweetwater County with a labor force totaling 23,523 workers. The workforce in Albany County is 20,045 workers. Carbon County has the highest unemployment rate, with 4.10 percent of its 7,836 workers not employed.

Workforce by Sector

The majority of the workforce within the study area is employed in the retail and services; construction; finance, insurance, and real estate (FIRE); professional/technical services; health care and social assistance; accommodation and food services; and governmental services sectors of the economy (Table 2-8).

Table 2-8 displays employment by sector in the study area as of 2006.

TABLE 2-8
Employment by Sector in the Study Area, 2006

NAICS Category	Albany	Carbon	Natrona	Sweetwater
Farm, forestry, fishing and related	68	175	112	(D)
Mining	14	162	3,996	5,214
Utilities	(D)	(D)	(D)	(D)
Construction	780	626	2,385	1,619
Manufacturing	578	365	1,853	1,196
Wholesale Trade	123	210	2,420	619
Retail Trade	1,765	713	4,857	2,488
Transportation and Warehousing	150	214	987	1,077
Information	206	75	551	211
Finance, Insurance, Real Estate (FIRE)	606	227	2,010	789
Professional and Technical Services	734	118	1,329	447
Management of Companies and Enterprises	(D)	(D)	(D)	53
Administrative and Waste Services	170	88	1,386	505
Educational Services	(D)	(D)	110	(D)
Health Care and Social Assistance	1,191	393	4,583	880
Arts, Entertainment, and Recreation	224	42	347	128
Accommodation and Food Services	1,591	879	3,152	2,150
Other Services, Except Public Administration	710	150	1,437	599
Government and Government Enterprises	5,694	1,892	5,358	3,973
Total	**15,038**	**6,449**	**37,038**	**22,448**

(D) Not shown to avoid disclosure of confidential information, but estimates for this item are included in the total.

Source: Wyoming Department of Employment (DOE), Research and Planning, Accessed June 2007. http://doe.state.wy.us/lmi/06Q1_QCEW/toc.htm

The percent contribution that each industry provides to the overall employment picture in the study area is displayed in Figure 2-3.

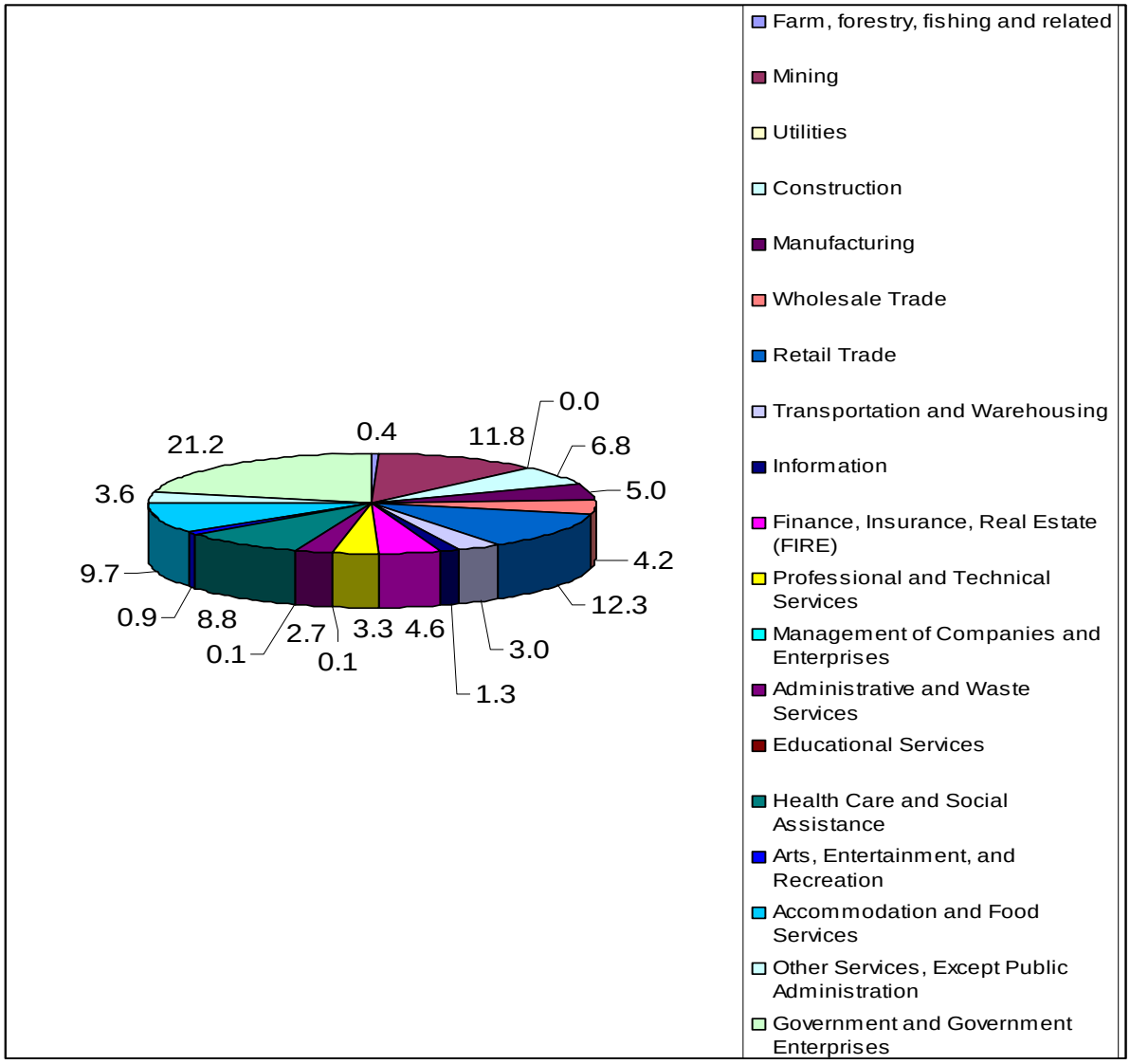

FIGURE 2-3
Industry Mix in Study Area

Income

Total personal income is shown in Table 2-9 for each of the study area counties from 1970 to 2000. The values reported below are unadjusted for the effects of inflation.

TABLE 2-9
Total Personal Income in the Study Area, 1970 to 2000

County	1970	1980	1990	2000	Increase from 1990 to 2000
Albany	$353,000,000	$564,000,000	$591,000,000	$757,000,000	28%
Carbon	$262,000,000	$626,000,000	$377,000,000	$365,000,000	-3%
Natrona	$1,053,000,000	$2,173,000,000	$1,722,000,000	$2,137,000,000	24%
Sweetwater	$312,000,000	$1,126,000,000	$923,000,000	$1,091,000,000	18%

Source: Population, Employment, Earnings and Personal Income Trends, Sonoran Institute, Compiled by the Wyoming Economic Analysis Division.

Incomes significantly increased overall from 1970 to 1980. There was a decrease in personal incomes from 1980 to 1990 in all study area counties with the exception of Albany County. This coincides with the end of the energy boom in the region.

From 1990 to 2000, Albany and Natrona Counties saw the greatest increases in total personal income, followed by Sweetwater County. Carbon County, meanwhile, experienced a decrease in personal income of 3 percent. The growth in these counties, with the exception of Carbon County is a result of the current energy boom in the region.

2.3.1.2 Historic Employment by Industry

Job growth in the study area over the past 30 years has primarily been in the services and professional sector.

Table 2-10 displays the proportion of employment in each industry, by county, in the study area for 1970 and 2000.

TABLE 2-10
Employment by Industry as a Percent of Total Employment in the Study Area, 1970 and 2000

	Farm and Agricultural Services		Mining		Manufacturing		Services & Professional		Construction		Government	
County	1970	2000	1970	2000	1970	2000	1970	2000	1970	2000	1970	2000
Albany	4.0%	3.1%	0.2%	0.2%	5.6%	3.9%	49.2%	55.7%	3.8%	5.3%	37.3%	31.7%
Carbon	10.7%	8.7%	10.6%	3.2%	6.0%	6.4%	50.8%	53.7%	3.1%	7.1%	18.9%	20.8%
Natrona	2.6%	2.4%	15.1%	6.8%	6.3%	4.0%	53.3%	67.6%	5.8%	6.4%	16.9%	12.7%
Sweetwater	2.5%	0.2%	23.0%	25.0%	2.9%	9.8%	35.3%	28.3%	6.8%	5.3%	13.4%	12.0%

Source: Population, Employment, Earnings and Personal Income Trends, Sonoran Institute, Compiled by the Wyoming Economic Analysis Division.

Work in farming and agriculture and mining has decreased in all of the counties over the past 30 years. Manufacturing (except in Albany and Natrona Counties) and the services and professional employment categories (except Sweetwater County) have increased.

Construction employment has increased in all counties, with the exception of Sweetwater County.

2.3.1.3 Existing Labor Characteristics and Availability

General Construction Labor Characteristics

There are 5,410 persons (2006) employed in the construction industry in the study area and 20,373 (average monthly employment 2006) in Wyoming. The share of total employment for construction in the state is 12.5 percent, which is consistent with the share in the study area as well.

The mean hourly wage per construction worker in Carbon County is $18.53 and $19.04 within the four-county study area. This is comparable to Wyoming with a mean hourly wage per construction worker of $18.84.

The mean wages in the construction industry exceed the mean wages in all industries in the state. The mean wages in Wyoming for construction workers were $39,194 (2006), while mean wages for all industries were $34,240.

The five states to which the Wyoming population is most likely to migrate are California, Colorado, Montana, Texas, and Utah. Table 2-11 compares the average hourly wages in these states and the United States as a whole to Wyoming for short- to long-term, on-the-job training professions. The category short- to long-term, on-the-job training professions includes the construction industry.

TABLE 2-11
Average Hourly Wage for Short- to Long-Term, On-the-Job Training Professions Relative to the United States and the Five Major Destination States for Out-Migration from Wyoming, 1998

Wyoming	California	Colorado	Montana	Texas	Utah	U.S.
$9.83	$12.00	$11.09	$9.50	$10.32	$10.20	$11.25

Source: Research & Planning Wyoming DOE. Outlook 2000: Detailed Occupational Projections and Labor Supply, October 2000.

The evaluation completed in Outlook 2000: Detailed Occupational Projections and Labor Supply by the Research and Planning Department of the Wyoming Department of Employment (DOE) (Wyoming DOE, 2000), indicates that wages paid in Wyoming are generally lower for most occupations compared to the five major destination states for out-migration.

Labor Characteristics of Trades Specific to This Project

The types of labor required for construction of this project include workers in the following construction categories:

- Civil Works
- Structural Steel
- Equipment
- Piping
- Electrical
- Instrumentation
- Insulation/Paint

Table 2-12 displays information relative to construction specialty trade areas including total employment and wage information for the three geographic regions of Wyoming containing the study area counties (Albany, Carbon, Natrona, and Sweetwater Counties) for November 2005. Note that although all construction specialty trade areas are not an exact fit for the job requirements of this facility, they are similar.

TABLE 2-12
Hourly Compensation for Selected Construction Trades, 2006

Standard Occupational Classification	Total Employment	Mean Wage	Entry Level	Experienced Level	25th Percentile	50th Percentile (Median)	75th Percentile
Earthwork-excavating and loading machine and dragline operators	340	17.32	13.93	19.01	14.61	16.36	20.30
*Concrete-paving, surfacing, and tamping equipment operators	150	16.62	11.73	19.07	13.35	16.47	19.90
Steel-metal workers, welders, cutters, solderers, and brazers	900	16.73	12.17	19.01	13.50	16.35	19.51
Mechanical-machinists	240	18.02	13.32	20.37	14.42	16.79	21.63
Piping-plumbers, pipefitters, and steamfitters	610	20.13	15.56	22.41	16.22	18.62	21.76
Electrical-electricians	1020	21.88	17.09	24.27	18.33	21.31	24.61
Instrumentation and controls-industrial machinery mechanics	570	21.58	14.81	24.96	16.06	19.66	26.36
Painting-painters construction and maintenance	300	15.69	10.77	18.15	11.83	15.44	19.28
Insulation-installation, maintenance, and repair occupations, all	7780	18.92	11.16	22.80	13.05	18.33	24.11
Buildings-carpenters	1220	17.84	14.75	19.76	15.56	18.03	20.36

Source: Wages and Benefits in Wyoming, Combining the Wyoming Wage Survey and the Employer Benefits Survey, Wyoming DOE, 2006.

*Statewide Data

2.3.1.4 Governmental Revenues

Ad Valorem Taxes: Assessed Property Values

Assessed property values are the basis for ad valorem taxes. Properties are assessed at both the local (county) and state level. The state assesses utility and mineral properties, while the counties assess residential, agricultural, commercial, and industrial properties.

Total assessed land values in 2006 for the four-county study area were $4,494,177,516. Table 2-13 displays the assessed property values, by county, in the study area in 2006.

TABLE 2-13
Assessed Property Values by Type of Property and by County in the Study Area, 2006

County	Agricultural Land (Locally Assessed)	Commercial Land (Locally Assessed)	Residential Land (Locally Assessed)	Industrial Land (Locally Assessed)	Utilities (and other State Assessed, Non-Mineral Properties)	Mineral Properties (State Assessed)	Total
Albany	$6,957,759	$51,543,037	$176,903,295	$7,109,139	$23,810,552	$4,423,477	$270,747,259
Carbon	$8,893,032	$16,609,859	$50,694,637	$45,756,502	$46,271,365	$730,458,033	$898,683,428
Natrona	$5,995,254	$115,362,121	$316,741,307	$33,375,007	$35,863,163	$436,769,082	$944,105,934
Sweetwater	$4,363,106	$43,459,881	$140,874,670	$201,398,891	$149,150,470	$1,841,393,877	$2,380,640,895
Total	**$26,209,151**	**$226,974,898**	**$685,213,909**	**$287,639,539**	**$255,095,550**	**$3,013,044,469**	**$4,494,177,516**

Source: State of Wyoming Department of Revenue 2006 Annual Report.

Sweetwater County has the highest assessed property values in the study area with a total of $2,380,640,895. The major share of assessed land valuations in Sweetwater County are the mineral properties assessed at $1,841,393,877 followed by industrial land assessed at $201,398,891. Albany County has the lowest assessed property values in the study area with a total of $270,747,259.

Mill levies are then assessed to property values to determine the tax rates for various properties. Average mill levies range from 63.09 in Carbon County to 66.38 in Natrona County. Ad valorem taxes support a number of county and municipal operations including airports, fire protection, hospitals, libraries, museums, public health, recreational systems, special districts, and education. Table 2-14 displays the major beneficiaries of ad valorem taxes in the state.

TABLE 2-14
Beneficiaries of Ad Valorem Taxes in Wyoming

Beneficiary	Percent of Total
Schools	54.72
Counties	18.44
Foundation Program	18.91
Special Districts	6.71
Municipalities	1.22

Source: State of Wyoming Department of Revenue 2006 Annual Report.

Sales and Use Tax

The State of Wyoming levies a 4 percent sales and use tax. Counties have the option of levying additional sales and use taxes up to 2 percent and a lodging option tax. All of the counties in the study area levy an additional 1 percent general purpose county sales and use tax. Albany and Sweetwater County have an additional 1 percent specific purpose option tax. The lodging tax rate for Albany County is 4 percent, 3 percent in Natrona County, and 2 percent in Carbon and Sweetwater Counties. The total lodging and sales/use tax rate for Albany County is 10 percent, 7 percent in Carbon County, 8 percent in Natrona County, and 8 percent in Sweetwater County.

Sales and use tax revenue collections for 2007 in the study area are displayed in Table 2-15.

TABLE 2-15
Sales and Use Tax Revenue by County, 2007

County	State Sales Tax Revenue	State Use Tax Revenue	County Sales and Use Tax Revenue	County Lodging Tax Revenue	Total County Distribution
Albany	1,204,737	87,228	624,173	31,856	1,947,994
Carbon	1,736,108	706,600	1,220,716	26,859	3,690,283
Natrona	5,862,123	442,718	1,576,206	59,365	7,940,412
Sweetwater	6,112,899	1,331,938	3,711,151	44,815	11,200,803
Total	14,915,867	2,568,484	7,132,246	162,895	24,779,492

Source: Wyoming Department of Revenue Sales and Use Tax Distribution Report, 2007.

2.3.2 Future Economic Conditions

2.3.2.1 Future Economic Projections

Employment Outlook: 2010 (Wyoming DOE, 2003) describes the labor market history in Wyoming as showing a gradual increase in the services-producing sector, consistent with national trends, but more volatile employment in the goods-producing sectors of mining and construction. The projection is that these trends will continue up to 2010 with the following important differences:

- The aging population will likely increase the demand for health services and potentially increase health care employment opportunities and job openings in the state.
- The maturing population will also decrease the mobility of the labor force, making job-related migrations less likely than in the previous decade.
- The low-wage structure in the services-producing sector and the instability in the goods-producing sector do not produce enough sustained demand to attract new labor. Therefore, the outlook up to 2010 is one in which the state's resident labor force will represent most of the labor available for work.
- Competition with neighboring states for labor may intensify as economies of neighboring states are more diversified and provide higher wages.

Wyoming's natural resource industry, associated with a strong performance in the retail sector, allowed Wyoming to withstand the recession in 2001. However, limited economic diversity leaves the economy vulnerable to upset.

Employment Outlook: 2010 (Wyoming DOE, 2003) projects slower anticipated job and population growth than experienced in the previous decade. From 1990 to 2000, jobs in Wyoming grew at an average annual rate of 1.9 percent per year and population grew at an average annual rate of 0.9 percent per year. From 2000 to 2010, the forecast anticipates an annual job growth rate of 1.5 percent and a population increase of 0.4 percent per year.

2.3.2.2 Future Employment Growth

Growth in the construction sector is highly sensitive to both population growth and governmental spending on infrastructure. Population growth in Wyoming is expected to slow in the next decade. Therefore, growth in construction employment is also expected to decline, slowing from 5.1 percent on an average annual basis to 1.2 percent.

Table 2-16 displays employment forecasts for the construction industry in Wyoming to 2010.

TABLE 2-16
Construction Employment in Wyoming, 1990, 2000, and 2010

	1990	2000	2010 Projected	Change 1990 to 2000	Projected Change 2000 to 2010	Average Annual Change 1990 to 2000	Projected Average Annual Change 2000 to 2010
General Contractors	2,099	4,285	5,242	2,186	957	7.4%	2%
Heavy Construction	3,866	5,301	5,408	1,435	107	3.2%	.2%
Special Trade Contractors	4,815	8,085	9,291	3,270	1,206	5.3%	1.4%
Total Construction	10,780	17,671	19,941	6,891	2,270	5.1%	1.2%

Source: Employment Outlook: 2010, Wyoming DOE, 2003

Projections also indicate that the industry mix in construction will change as the numbers of general contractors and specialty trade contractors are expected to grow more than the construction industry as a whole.

2.3.2.3 Future Labor Characteristics and Availability

As of 2000, there were 5,410 construction workers in the study area. Average annual turnover rates in the construction industry range from 37 to 58 percent.

The Wyoming DOE projects that construction employment will grow at an average annual rate of 4.0 percent. Table 2-17 displays the potential labor force within the study area, disaggregated by county, assuming that the study area rate of growth is similar to that projected for the state.

TABLE 2-17
Construction Employment Estimates, 2006 to 2013

County	Existing (2006)	2007	2008	2009	2010	2011	2012	2013
Albany	780	811	844	1,687	1,755	1,825	1,898	1,974
Carbon	626	651	677	1,354	1,408	1,465	1,523	1,584
Natrona	2,385	2,480	2,580	5,159	5,366	5,580	5,803	6,036
Sweetwater	1,619	1,684	1,751	3,502	3,642	3,788	3,940	4,097
Total	5,410	5,626	5,851	11,703	12,171	12,658	13,164	13,690

Source: CH2M HILL estimates completed for this project, 2007. http://eadiv.state.wy.us/wef/wef.html

2.4 Housing

2.4.1 Existing Housing Stock

There were a total of 62,322 occupied housing units in the four-county study area at the time of the 2000 U.S. Census. Table 2-18 provides a breakdown of the housing inventory by type of structure and occupant type for each county, not including vacant units. Vacant units are discussed in Section 2.4.2.

Natrona County, with the highest population, had the greatest number of occupied housing units, with a total 26,819, followed by Sweetwater and Albany Counties with 14,105 and 13,269 occupied units, respectively. Carbon County had the lowest number of occupied housing units with 6,129. Most of the housing stock is owner rather than renter occupied. Approximately 51 to 75 percent of the units are owner occupied, with the remaining stock being rental units.

TABLE 2-18
Occupant by Type of Structure within the Study Area, 2000

Type of Unit	Albany County	% of Total	Carbon County	% of Total	Natrona County	% of Total	Sweetwater County	% of Total
Owner Occupied	**6,808**	**51%**	**4,343**	**71%**	**18,757**	**70%**	**10,591**	**75%**
Single-Family Units	5,662	43%	3,471	57%	16,385	61%	7,807	55%
Duplexes	71	1%	16	0%	46	0%	42	0%
Tri- and Four-Plexes	16	0%	2	0%	63	0%	42	0%
Multi-Family Units	52	0%	26	0%	77	0%	6	0%
Mobile Home	1,004	8%	824	13%	2,156	8%	2,694	19%
Boat, RV, Van, etc.	3	0%	4	0%	30	0%	0	0%
Renter Occupied	**6,461**	**49%**	**1,786**	**29%**	**8,062**	**30%**	**3,514**	**25%**
Single-Family Units	1,771	13%	872	14%	3,132	12%	1,230	9%

TABLE 2-18
Occupant by Type of Structure within the Study Area, 2000

Type of Unit	Albany County	% of Total	Carbon County	% of Total	Natrona County	% of Total	Sweetwater County	% of Total
Duplexes	873	7%	95	2%	416	2%	324	2%
Tri- and Four-Plexes	1,090	8%	164	3%	1,116	4%	506	4%
Multi-Family Units	2,208	17%	395	6%	2,456	9%	922	7%
Mobile Home	519	4%	260	4%	936	3%	532	4%
Boat, RV, Van, etc.	0	0%	0	0%	6	0%	0	0%
Total Units	**13,269**	**100%**	**6,129**	**100%**	**26,819**	**100%**	**14,105**	**100%**
Single-Family Units	7,433	56%	4,343	71%	19,517	73%	9,037	64%
Duplexes	944	7%	111	2%	462	2%	366	3%
Tri- and Four-Plexes	1,106	8%	166	3%	1,179	4%	548	4%
Multi-Family Units	2,260	17%	421	7%	2,533	9%	928	7%
Mobile Home	1,523	11%	1084	18%	3,092	12%	3,226	23%
Boat, RV, Van, etc.	3	0%	4	0%	36	0%	0	0%

Source: 2000 U.S. Census

Figure 2-4 displays the breakdown of the types of units that comprise the housing stock in each county. Most of the occupied housing stock for all counties is single family. Natrona County has the greatest percentage of single-family units, with approximately 73 percent of its nearly 26,819 units consisting of single-family housing. Natrona County also had the highest number of renter occupied units. Carbon County had the least amount of housing units, with a total of 6,129 units. Albany County had the highest percentage of multi-family housing units with 7 percent duplexes, 8 percent tri- and four-plexes, and 17 percent multi-family units. Carbon County had the highest percentage of mobile home units making up a total of 18 percent of the total housing.

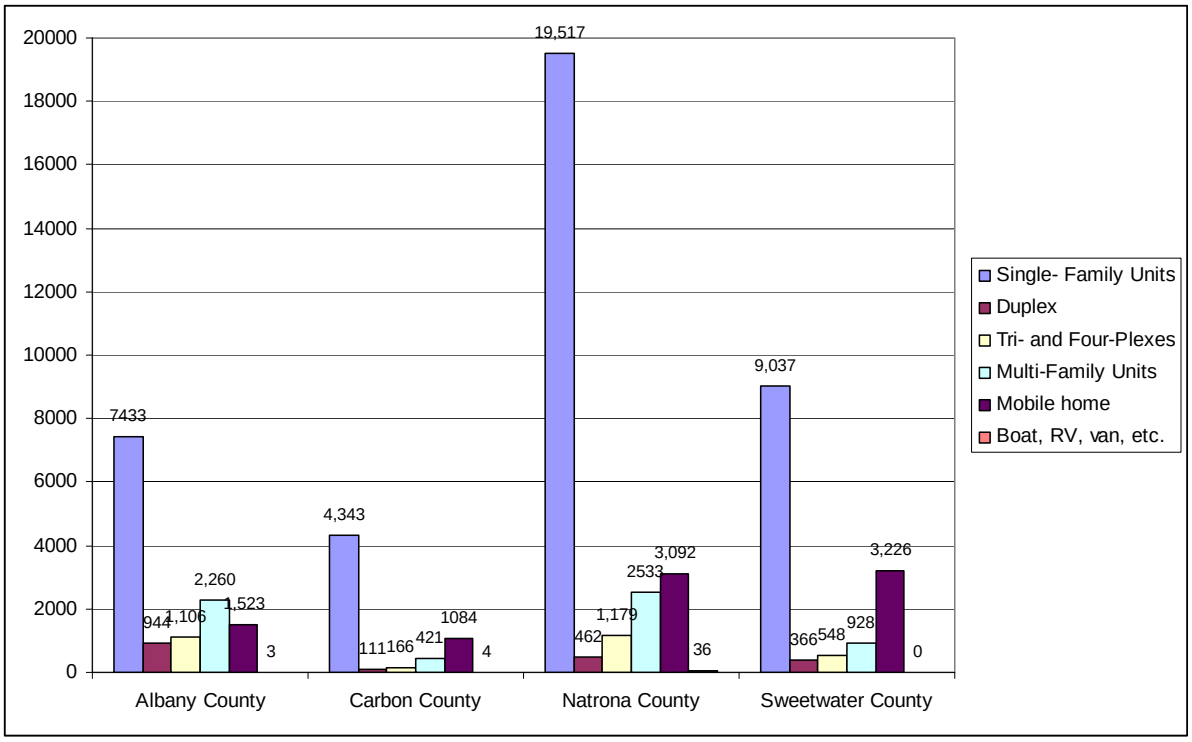

FIGURE 2-4
Number of Units by Unit Type for Each County within the Study Area

Home Ownership

As would be expected, over 82 percent of single-family units are owner occupied. There is also a high owner occupancy rate for mobile homes, with nearly 75 percent of mobile homes being owner occupied. Homeowner occupancy rates are lowest in multi-family units, with 9 percent for duplexes, 4 percent for tri- and four-plexes, and nearly 3 percent for multi-family units with five or more units.

Renters

Renter-occupied units are typically duplexes, tri- and four-plexes, and multi-family units. The percentage of rental duplex units ranged from 2 percent in Carbon, Natrona, and Sweetwater County to 7 percent in Albany County. All of the tri- and four-plex units in most of the counties were occupied by renters. The percentage of rental units that are multi-family ranged from a high of 17 percent in Albany County to a low of 6 percent in Carbon County.

As would be expected, renters occupy fewer of the single-family units in the study area than homeowners. Renter-occupied, single-family units ranged from 9 percent in Sweetwater County to 14 percent in Carbon County. Renter-occupied mobile homes range from 3 to 4 percent for the study area counties.

Figures 2-5 and 2-6 show the distribution of owner- and renter-occupied housing units by type of unit. Homeowners clearly tend to occupy single-family units, whereas renters occupy a variety of housing types including single-family, duplex, tri- and four-plex, and multi-family units.

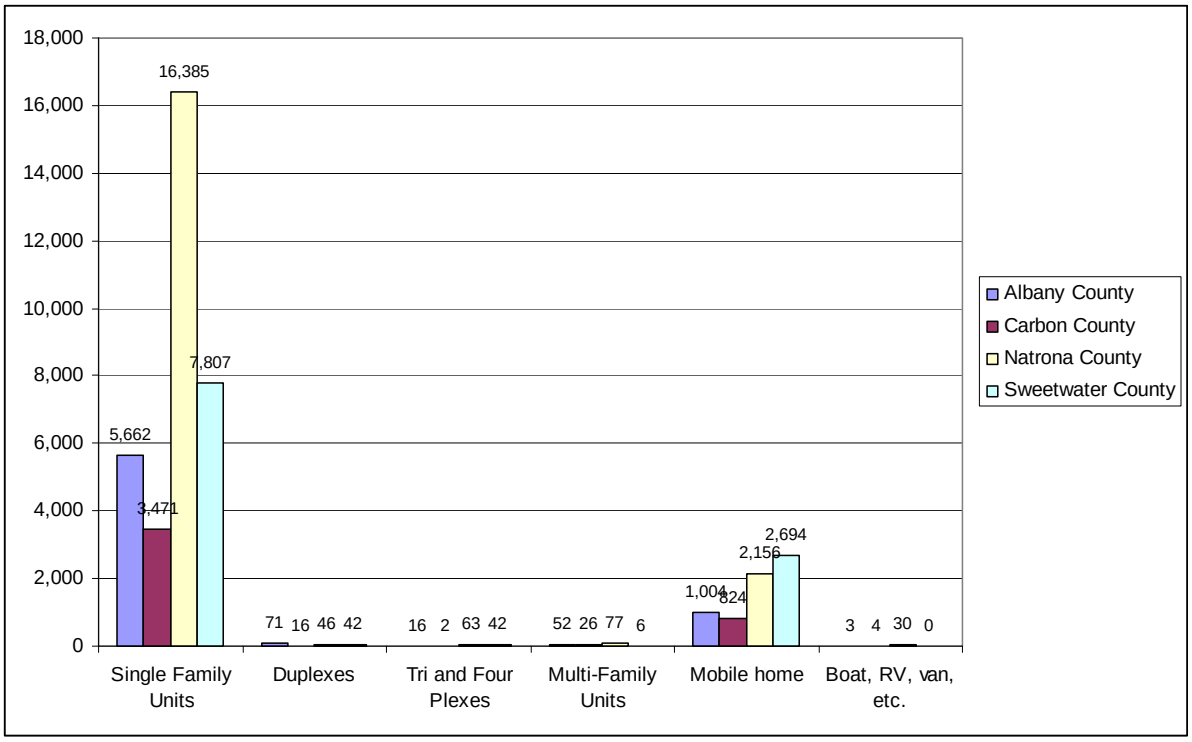

FIGURE 2-5
Owner-Occupied Units by Type of Unit for the Study Area

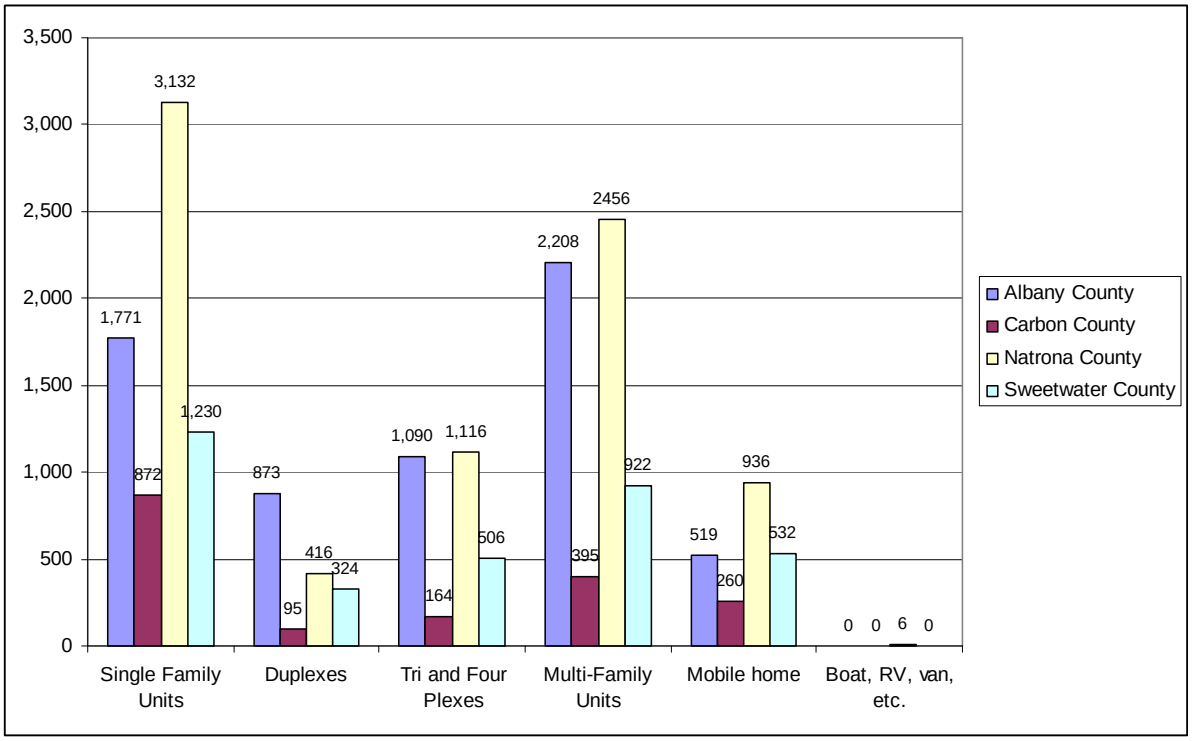

FIGURE 2-6
Renter-Occupied Units by Type of Unit for the Study Area

2.4.2 Housing Inventories Past and Present

A summary of characteristics pertaining to the housing inventory within the study area for both 1990 and 2000 is presented in Table 2-19. The table provides information on vacancy rates for both owner-occupied and rental units as well as median cost and rent of such units for both census years.

TABLE 2-19
Housing Summary of Occupied and Vacant Units, 1990 and 2000

	Albany County	Carbon County	Natrona County	Sweetwater County
Occupied and Vacant Units				
Number of Units (1990 census)	13,844	8,190	29,082	15,444
Number of Units (2000 census)	15,215	8,307	29,882	15,921
Change in Number of Units (1990 to 2000)	+10%	+1%	+3%	+3%
Number of Occupied Units (1990)	11,957	6,001	23,837	13,616
Number of Occupied Units (2000)	13,269	6,129	26,819	14,105
Change in Occupied Units (1990 to 2000)	+11%	+2%	+13%	+4%
Number of Vacant Units (1990)	1,887	2,189	5,245	1,828
Number of Vacant Units (2000)	1,946	2,178	3,063	1,816
Change in Number of Vacant Units (1990 to 2000)	+3%	-1%	-42%	-1%
Vacancy Rate (1990)	14%	27%	18%	12%
Vacancy Rate (2000)	13%	26%	10%	11%
Rental Unit Availability				
Number of rental units (1990)	473	504	1,614	684
Number of rental units (2000)	356	360	740	681
Change in number of rental units (1990 to 2000)	-25%	-29%	-54%	0%
Houses Available				
Number of houses for sale (1990)	134	249	987	294
Number of houses for sale (2000)	140	217	288	282
Change in number of houses for sale (1990 to 2000)	+4%	-13%	-71%	-4%
Other Available Housing				
Number of Units for Migrant Workers (1990)	13	19	12	13
Number of Units for Migrant Workers (2000)	1	13	9	12
Change in Number of Units for Migrant Workers (1990 to 2000)	-92%	-32%	-25%	-8%
Other Vacant Housing (1990)	261	605	1,441	571

TABLE 2-19
Housing Summary of Occupied and Vacant Units, 1990 and 2000

	Albany County	Carbon County	Natrona County	Sweetwater County
Other Vacant Housing (2000)	274	467	872	539
Change in Number of Other Vacant Housing (1990 to 2000)	+5%	-23%	-39%	-6%
Median Cost				
Median Monthly Rent (1990)	$343	$301	$298	$350
Median Monthly Rent (2000)	$464	$377	$409	$428
Change in Median Monthly Rent (1990 to 2000)	+35%	+25%	+37%	+22%
Median Housing Unit Value (1990)	$67,300	$52,700	$53,100	$70,900
Median Housing Unit Value (2000)	$118,600	$76,500	$84,600	$104,200
Change in Median Housing Unit Value (1990 to 2000)	+76%	+45%	+59%	+47%

Source: 1990 & 2000 U.S. Census

As shown in the table, the number of housing units for each county increased between 1990 and 2000. The increase ranged from a low of 1 percent in Carbon County to a high of 10 percent in Albany County. As the housing stock increased, the number of vacant units between 1990 and 2000 also decreased, with the exception of Albany County, which experienced a 3 percent increase in the number of vacant units. The percent of vacant units dropped by 42 percent in Natrona County and 1 percent for Carbon and Sweetwater Counties.

The reduction in total vacancy units also translated to a reduction in both the number of units available for rent or for sale. Rental unit availability declined 25 percent in Albany County and 29 percent in Carbon County. Natrona County experienced the greatest decline in rental unit availability at 54 percent. Sweetwater County essentially remained unchanged. The number of houses for sale decreased in every county between 1990 and 2000, with the exception of Albany County. From 1990 to 2000 the number of houses for sale in Albany increased by 4 percent. Natrona County experienced the largest decrease in housing units for sale, with a decrease of 71 percent from 1990 to 2000. Housing units for sale in Carbon County decreased by 13 percent, and there was a 4 percent decrease in Sweetwater County.

Rents and home values also increased between 1990 and 2000. Rents increased between 30 percent ($84) in Sweetwater County and 45 percent ($134) in Albany County. Rents in Carbon and Natrona Counties increased by 34 percent and 40 percent, respectively. Housing values increased substantially more than monthly rents between 1990 and 2000, increasing anywhere from 45 percent in Carbon County to 76 percent in Albany County. The actual value increases for Carbon and Albany Counties were $23,800 and $51,300, respectively.

To assess the amount of development occurring over the past few years within the study area, Table 2-20 lists the number of building permits obtained within each county by type of

unit from 2003 and 2005. The table also provides an estimate of those units that are renter and owner occupied.

TABLE 2-20
Building Permits by Unit Type within the Study Area, 2003-2005

Albany County Building Permits 2003-2005					
Year	**Single-Family Units**	**Duplex Units**	**Tri- and Four-Plex Units**	**Multi-Family Units**	**Total Units**
2003	193	2	28	48	271
2004	210	2	16	182	410
2005	192	-	110	292	594
Total	595	4	154	522	1,275
3-yr Average	198	1	51	174	424
% Rental	24%	92%	99%	98%	78%
% Owner	76%	8%	1%	2%	22%
Carbon County Building Permits 2003-2005					
Year	**Single-Family Units**	**Duplex Units**	**Tri- and Four-Plex Units**	**Multi-Family Units**	**Total Units**
2003	33	-	-	-	33
2004	60	-	-	-	60
2005	65	-	-	-	65
Total	158	-	-	-	158
3-yr Average	53	-	-	-	53
% Rental		NA	NA	NA	29%
% Owner		NA	NA	NA	71%
Natrona County Building Permits 2003-2005					
Year	**Single–Family Units**	**Duplex Units**	**Tri- and Four-Plex Units**	**Multi-Family Units**	**Total Units**
2003	234	-	-	-	234
2004	284	-	-	-	284
2005	444	-	-	-	444
Total	962	-	-	-	962
3-yr Average	321	-	-	-	321
% Rental		NA	NA	NA	30%
% Owner		NA	NA	NA	70%

TABLE 2-20
Building Permits by Unit Type within the Study Area, 2003-2005

Sweetwater County Building Permits 2003-2005					
Year	Single–Family Units	Duplex Units	Tri- and Four-Plex Units	Multi-Family Units	Total Units
2003	63	-	-	-	63
2004	216	-	-	-	216
2005	260	-	-	-	260
Total	539	-	-	-	539
3yr Average	180	-	-	-	180
% Rental		NA	NA	NA	25%
% Owner		NA	NA	NA	75%

Source: Wyoming Housing Database Partnership. *A Profile of Wyoming Demographics, Economics, and Housing Semiannual Report, Ending June 30, 2006*. August 2006.

From 2003 to 2005, Albany County had the largest growth in its housing stock with 1,275 buildings permitted, followed by Natrona County with 962. Sweetwater County had the third-highest growth with 539 buildings permitted, while Carbon County had the fewest with 158 buildings permitted during the 3-year period.

2.4.3 Housing Survey of Needs

The potential housing need in each county through 2025 is provided in Table 2-21. The total number of households as well as the number of renter and owner households was provided by the study entitled *A Profile of Wyoming Demographics, Economics and Housing* (Wyoming Housing Database Partnership, 2007). The housing gap for all households within each county was estimated using the average annual unit increase per year based on the change in housing stock. Note that this number does not necessarily match the average number of buildings permitted, because permitted buildings are not necessarily completed and occupied the year that they are permitted. In addition, buildings, especially those that are multi-family, may contain multiple units that are not reflected in the building permit number. The unit projections for 2000 and 2005 for renter and homeowner units were estimated by using the ratio of owner/renter households to total households for each county. The number of new owner-occupied and rental housing units was estimated by multiplying the average unit increase per year for all household by the estimated average or renter- and owner-occupied units found for each county. For example, in Albany County, the 222.8 average unit increase was multiplied by 78 percent to obtain the estimated average unit increase of rental units.

As shown in Table 2-21, when looking at the total households, regardless of occupant type, the counties with a housing shortfall are Natrona and Sweetwater. The gap begins in year 2010 for both counties, with a deficit of 1,445 homeowner units for Natrona County and 909 homeowner units for Sweetwater County. The rental units for both counties experience

a deficit in 2015 with Natrona County having a shortfall of 501 units and Sweetwater having a shortfall of 213 units. These numbers are expected to increase through 2025.

Essentially, the majority of the housing gap shown in Table 2-21 is estimated to be caused by a lack of single-family homes as there is a deficit of 1,173 renter households compared to 16,618 homeowner households.

TABLE 2-21
Projected Housing Gap Analysis in the Study Area

Total Households																				
	Number of Households								Number of Units						Housing Gap				
County	2000	2005	2010	2015	2020	2025	2000	2005	Percent Change 2000-2005)	Average Unit Increase per Year	2010	2015	2020	2025	2000	2005	2010	2015	2020
Albany	13,269	13,176	13,921	14,928	16,090	17,434	15,215	16,329	7.32	222.8	17,443	18,557	19,671	20,785	1,946	3,153	3,522	3,629	3,581
Carbon	6,129	6,185	6,625	6,986	7,425	7,931	8,307	8,455	1.78	29.6	8,603	8,751	8,899	9,047	2,178	2,270	1,978	1,765	1,474
Natrona	26,819	28,941	32,827	36,528	39,727	42,905	29,882	30,668	2.63	157.2	31,454	32,240	33,026	33,812	3,063	1,727	-1,373	-4,288	-6,701
Sweetwater	14,105	14,769	17,486	19,306	21,388	23,606	15,921	16,254	2.09	66.6	16,587	16,920	17,253	17,586	1,816	1,485	-899	-2,386	-4,135
Total	*60,322*	*63,071*	*70,859*	*77,748*	*84,630*	*91,876*	*69,325*	*71,706*	*3.46*	119.1	72,301	72,897	73,492	74,087	9,003	8,635	1,442	-4,852	-11,138
Renter Households																			
	Number of Households								Number of Units						Housing Gap				
County	2000	2005	2010	2015	2020	2025	2000	2005	Percent Change 2000-2005)	Average Unit Increase per Year	2010	2015	2020	2025	2000	2005	2010	2015	2020
Albany	6,440	6,158	6,328	6,614	6,951	7,348	7,384	7,925	7.32	109.17	8,471	9,017	9,563	10,109	944	1,767	2,143	2,403	2,612
Carbon	1,775	1,708	1,769	1,796	1,840	1,896	2,406	2,449	1.78	8.58	2,492	2,534	2,577	2,620	631	741	723	738	737
Natrona	8,079	8,453	9,402	10,211	10,778	11,274	9,002	9,238	2.63	47.16	9,474	9,710	9,946	10,182	923	785	72	-501	-832
Sweetwater	3,519	3,525	4,128	4,435	4,775	5,115	3,972	4,055	2.09	16.65	4,138	4,222	4,305	4,388	453	530	10	-213	-470
Total	*19,813*	*19,844*	*21,627*	*23,056*	*24,344*	*25,633*	22,764	23,667	3.97	*45.39*	24,575	25,483	26,391	27,299	2,951	3,823	2,948	2,427	2,047
Homeowner Households																			
	Number of Households								Number of Units						Housing Gap				
County	2000	2005	2010	2015	2020	2025	2000	2005	Percent Change (2000-2005)	Average Unit Increase per Year	2010	2015	2020	2025	2000	2005	2010	2015	2020
Albany	6,829	7,018	7,596	8,314	9,139	10,087	7,831	8,404	7.32	113.63	8,972	9,540	10,108	10,676	1,002	1,386	1,376	1,226	969
Carbon	4,354	4,477	4,856	5,190	5,586	6,035	5,901	6,006	1.78	21.02	6,111	6,217	6,322	6,427	1,547	1,529	1,255	1,027	736
Natrona	18,740	20,488	23,425	26,317	28,949	31,631	20,880	21,430	2.63	110.04	21,980	22,530	23,080	23,630	2,140	942	-1,445	-3,787	-5,869
Sweetwater	10,586	11,245	13,358	14,871	16,613	18,492	11,949	12,199	2.09	49.95	12,449	12,698	12,948	13,198	1,363	954	-909	-2,173	-3,665
Total	*40,509*	*43,228*	*49,235*	*54,692*	*60,287*	*66,245*	46,561	48,039	3.17	*73.66*	49,512	50,985	52,458	53,931	6,052	4,811	277	-3,707	-7,829

Source: Wyoming Housing Database Partnership. A Profile of Demographics, Economics and Housing: Semiannual Report, Ending December 31, 2006. February 2007.

Notes:

- Due to rounding, the unit forecast for renters and homeowners does not match the total unit projects from the state.
- Negative numbers indicate a housing deficiency or gap.
- The number of new owner-occupied and rental housing units was estimated by multiplying the average unit increase per year for all households by the estimated average of renter- and owner-occupied units found in Table 2-20 for each county. For example, in Carbon County, the 8.58 average unit increase was multiplied by 29 percent to obtain the estimated average unit increase of rental units.
- Unit projections for 2000 and 2005 renter and homeowner units are a ratio of the total households. Example: Albany County has 13,269 households, 15,215 units, and 6,440 renter households. So (6,440/13,269)*15,215 totals 7,384 renter units.

[1]Note that while a surplus of rental units is indicated by this data, in actuality, homeowner households are unable to purchase housing and thereby will instead rent and occupy any surplus rental units.

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2.5 Educational Facilities

2.5.1 Location and Characteristics of Educational Facilities

The four-county study area consists of the following six school districts:

- Albany County School District 1
- Carbon County School Districts 1 and 2
- Natrona County School District 1
- Sweetwater County School Districts 1 and 2

These school districts operate a total of 104 educational facilities. Figure 2-7 displays the location of the mapped facilities within the school districts.

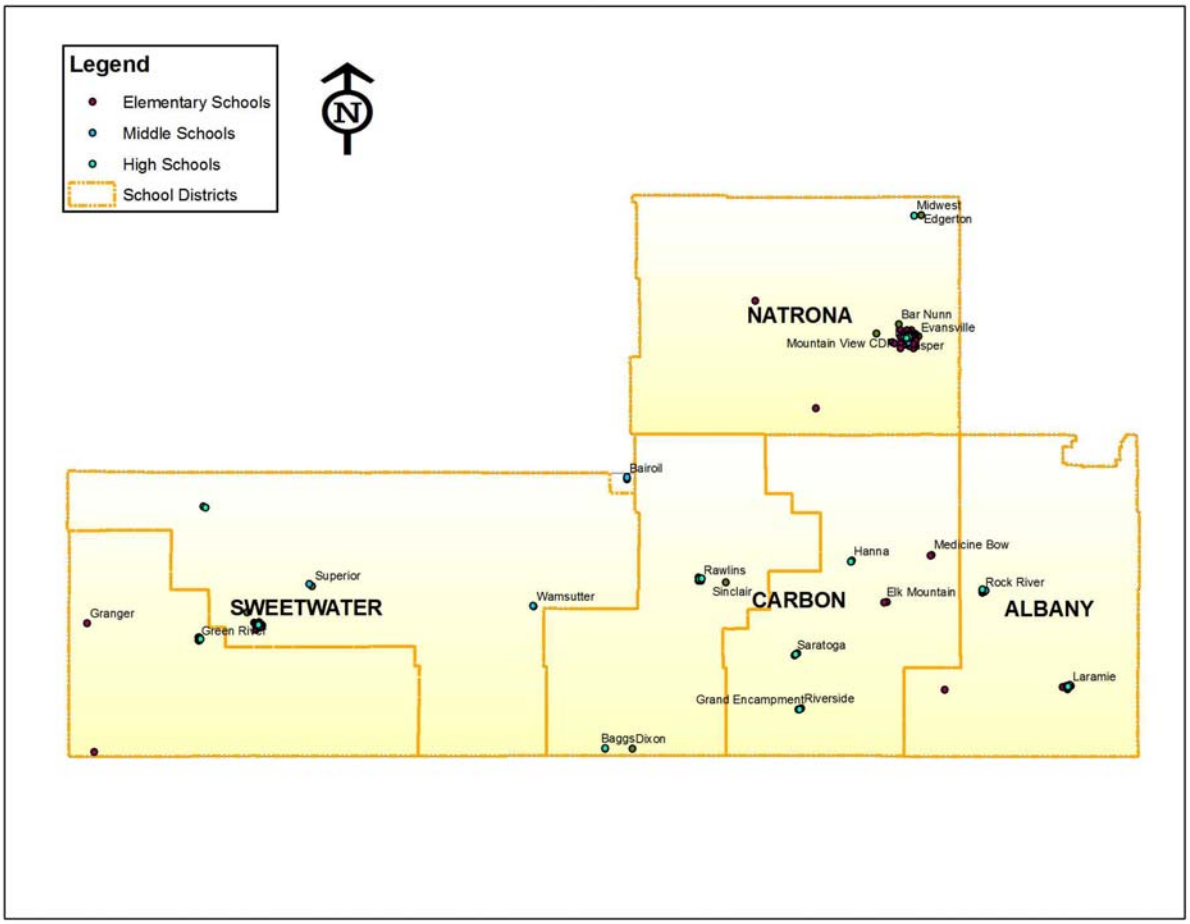

FIGURE 2-7
School Districts and Educational Facilities within the Study Area

Of the 104 facilities, the majority (66) are elementary schools, followed by 20 junior highs/middle schools and 18 high schools. Natrona County District 1 is the largest, with 38 educational facilities, followed by Albany District 1 and Sweetwater District 1, with 19

and 14 educational facilities, respectively. Table 2-22 shows the type and number of schools by district.

TABLE 2-22
Number and Type of Educational Facilities by School District

Schools	Albany District #1	Carbon District #1	Carbon District #2	Natrona District #1	Sweetwater District #1	Sweetwater District #2
Elementary	13	6	5	27	8	7
Jr. High/ Middle School	3	2	3	7	3	2
High School	3	3	3	4	3	2
Total	**19**	**11**	**11**	**38**	**14**	**11**

Source: Source: Wyoming Department of Education. Statistical Report Series 2, 2005.

Table 2-23 displays historic school enrollment by district from 1980 to 2006. Table 2-23 shows the most current student enrollment in 2006 by district. Natrona District #1 has the highest current enrollment with 11,444 students, followed by Sweetwater District #1 with 4,413 students, then Albany District #1 with 3,491 students. Sweetwater District had an enrollment of 2,551 students, and there were 1,753 students in Carbon District #1 in 2006. Carbon District #2 had the lowest enrollment for 2006, with 662 students. Figures 2-8, 2-9, and 2-10 demonstrate enrollment in the study area.

TABLE 2-23
Historic School District Enrollment – October 1st Enrollment (% of Population Enrolled in School)

Year	Albany District #1	Carbon District #1	Carbon District #2	Natrona District #1	Sweetwater District #1	Sweetwater District #2	Total Study Area
	3,491	1,753	662	11,444	4,413	2,551	
2006	11%	11%	4%	16%	11%	7%	24,314
	3,485	1,727	662	11,408	4,240	2,582	
2005	11%	11%	4%	16%	11%	7%	24,104
	3,559	1,664	700	11,546	4,197	2,620	
2004	11%	11%	5%	17%	11%	7%	24,286
	3,639	1,728	699	11,590	4,193	2,650	
2003	12%	11%	5%	17%	11%	7%	24,499
	3,659	1,778	743	11,650	4,264	2,688	
2002	12%	12%	5%	17%	11%	7%	24,782
	3,790	1,923	724	11,835	4,401	2,774	
2001	12%	13%	5%	18%	12%	8%	25,447
2000	3,791	1,946	791	12,038	4,665	2,928	26,159

TABLE 2-23
Historic School District Enrollment – October 1st Enrollment (% of Population Enrolled in School)

Year	Albany District #1	Carbon District #1	Carbon District #2	Natrona District #1	Sweetwater District #1	Sweetwater District #2	Total Study Area
	12%	12%	5%	18%	12%	8%	
	3,885	1,965	887	12,048	4,924	3,168	
1999	12%	12%	6%	18%	13%	8%	26,877
	3,868	1,992	898	12,271	5,171	3,269	
1998	12%	13%	6%	19%	13%	8%	27,469
	3,888	2,076	1,010	12,612	5,389	3,436	
1997	12%	13%	6%	19%	14%	9%	28,411
	4,133	2,216	1,033	12,885	5,573	3,595	
1996	13%	14%	6%	20%	14%	9%	29,435
	4,196	2,240	1,057	12,936	5,830	3,769	
1995	13%	14%	7%	20%	15%	9%	30,028
	4,170	2,224	1,130	13,100	5,903	3,870	
1994	13%	14%	7%	20%	15%	10%	30,397
	4,207	2,346	1,107	13,223	6,067	3,876	
1993	13%	14%	7%	21%	15%	10%	30,826
	4,231	2,379	1,123	13,015	6,115	3,917	
1992	13%	15%	7%	21%	15%	10%	30,780
	4,199	2,420	1,209	13,018	6,127	3,963	
1991	13%	15%	7%	21%	15%	10%	30,936

Source: Source: Wyoming Department of Education. Statistical Report Series 2, 2005.

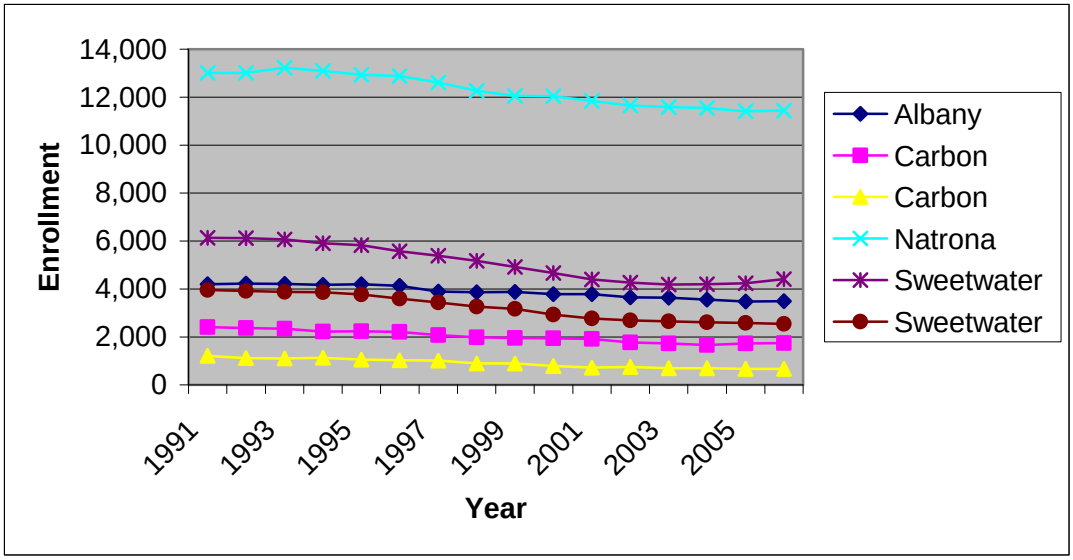

FIGURE 2-8
Historic Student Enrollment in the Study Area, 1991 to 2006

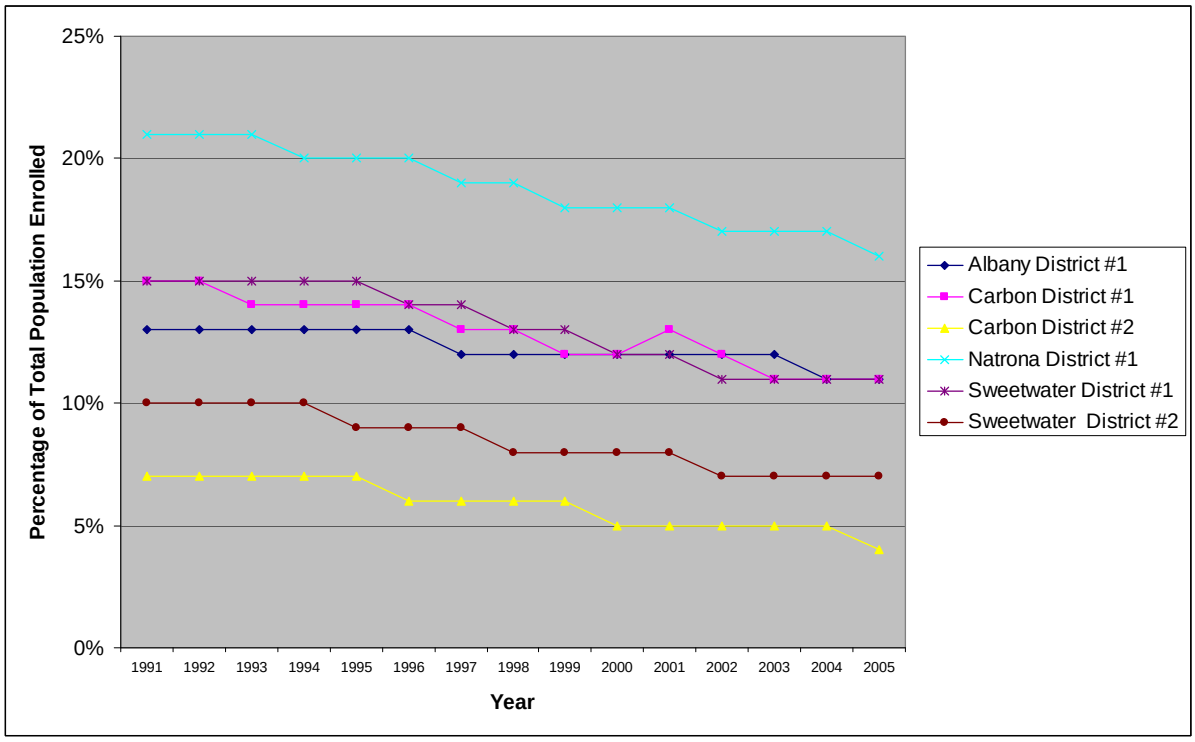

FIGURE 2-9
Percent of County Population in School

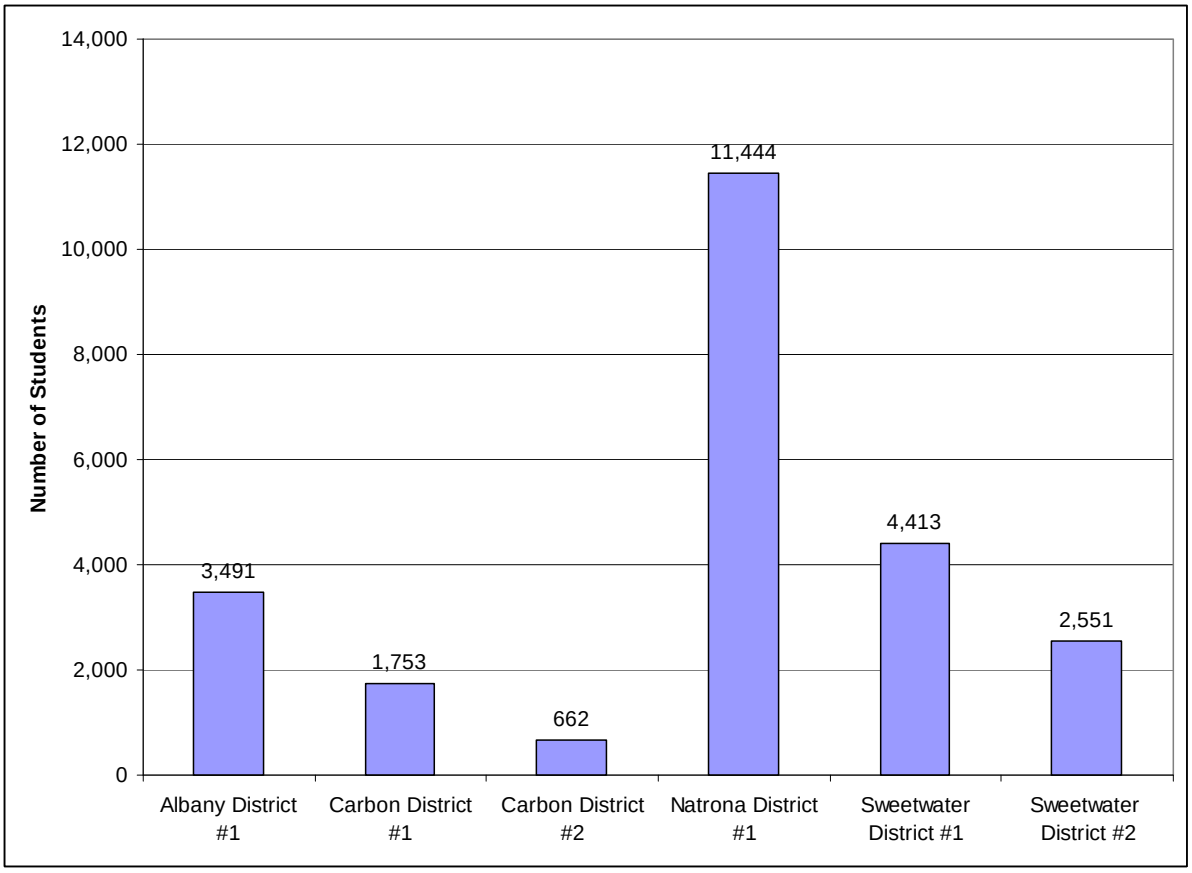

FIGURE 2-10
2006 Enrollment by School District within the Study Area

2.5.2 Pupil-Teacher Ratios

One approach to the measurement of school quality is to compare pupil-teacher ratios to community and national standards. Community standard measures would be determined by observing historic trends and determining an average for the study area. Additionally, community standards can be measured by observing study area trends as compared to the state as a whole and by observation relative to national standards.

Pupil-teacher ratios within the study area tend to be essentially the same as the state standards and significantly better than national standards. Table 2-24 displays historic pupil-teacher ratios by school district in the study area as compared to Wyoming and U.S. standards.

TABLE 2-24
Teacher-Pupil Ratio Historic Comparisons; District, State of Wyoming, and United States

Year	Albany District #1	Carbon District #1	Carbon District #2	Natrona District #1	Sweetwater District #1	Sweetwater District #2	Study Area Average	Wyoming	United States
2005	11.0	12.5	8.2	14.9	13.8	14.4	12.5	12.6	15.5
2004	11.5	12.3	8.9	14.4	13.8	14.6	12.6	12.8	15.6
2003	11.8	12.8	8.7	14.4	14.3	14.5	12.8	13.1	15.9
2002	12.0	14.2	9.0	14.6	13.5	13.3	12.8	13.3	15.9
2001	12.8	13.8	9.0	14.6	13.6	13.4	12.9	12.5	15.9
2000	12.5	13.8	9.3	15.1	14.3	14.0	13.2	13.3	16.0
1999	12.7	14.2	10.2	15.1	13.9	14.3	13.4	13.3	16.1
1998	13.8	14.4	10.2	15.9	15.0	14.5	14.0	14.2	16.4
1997	14.1	14.6	10.7	16.5	15.8	15.1	14.5	14.5	16.8
1996	14.5	15.7	10.5	16.1	16.0	15.2	14.7	14.7	17.1
1995	15.1	16.4	10.9	16.6	16.5	16.1	15.3	NA	NA

Source: Wyoming Department of Education. School District Statistical Profiles. Accessed online 3-2-2007

To determine the capacity of a school district, an assessment was completed of how many students could be added to a district compared to the Full-time Equivalent (FTE) Staff before a teacher-pupil ratio exceeds a certain standard. Table 2-25 displays the enrollment that would be needed before school districts in the study area would exceed national teacher-pupil ratios.

TABLE 2-25
Enrollment Increase Required Before U.S. Teacher-Pupil Standard is Exceeded

County	Total FTE 2005	Enrollment 2000	Student-Teacher Ratio in 2005	Number of Students who Could be Added Before U.S. Teacher-Pupil Ratio is Exceeded
Albany District #1	314	3,485	11	1,507
Carbon District #1	138	1,727	13	467
Carbon District #2	81	662	8	626
Natrona District #1	789	11,408	14	1,137
Sweetwater District #1	306	4,240	14	625
Sweetwater District #2	179	2,582	14	264
Total	**1,807**	**24,104**	**12 (Average)**	**4,626**

Source: CH2M HILL calculations, 2007.

2.5.3 Current Plans for Expansion

In order to assess what future needs are anticipated for the baseline population growth in the study area, local Capital Improvement Plans (CIPs) for the school districts in the study area were reviewed for plans for school expansions. Table 2-26 displays these plans.

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TABLE 2-26
Major Capital Improvement Projects for School Districts within the Study Area

District Name	School Name	Building Name	Project Description
Carbon County School District No. 1	Rawlins MS	Rawlins MS	Renovate heating and ventilation system, no AC
Carbon County School District No. 1	Rawlins Consolidated ES-Rawlins Consolidated ES (3-5) Proposed		Construction on new consolidated elementary school
Carbon County School District No. 1	Rawlins Consolidated ES-Rawlins Consolidated ES (K-2) Proposed		Construction of new elementary school
Carbon County School District No. 1	Rawlins HS (9-12)-Rawlins HS		Project Planning
Carbon County School District No. 2	Saratoga MS (6-8)	Saratoga MS	Demolition
Natrona County School District No. 1	Fairdale ES	Fairedale ES	Renovate 1995 addition of facility for program use
Natrona County School District No. 1	Fairdale ES	1301-005-0100-06-002	Addition: 2,400 sf - Construct
Natrona County School District No. 1	Fort Casper ES	Fort Casper ES	Replacement School
Natrona County School District No. 1	McKinley ES	McKinley ES Main Bldg	McKinley Westwood combination
Natrona County School District No. 1	Park ES	Park ES Main Bldg	Add new gym with K. Room and Music. Add approx. 10,000 sq ft and Demo
Natrona County School District No. 1	Red Creek ES	1301-021-0100-06-005	Replace Red Creek ES
Natrona County School District No. 1	Willard ES	Willard ES Main Bldg	The fire detection and alarm system does not meet present standards. Provide new system.
Natrona County School District No. 1	Willow Creek ES/Residence-Willow Creek ES Residence	1301-027-0100-06-002	Replace Willow Creek School
Natrona County School District No. 1	East Jr. High	East Jr. High School	Renovate 1995 addition of facility for program use
Sweetwater County School District No. 1	Central Administration	Transportation/Warehouse	Install addition to building for office (~12'x40' @ $150/SF)

TABLE 2-26
Major Capital Improvement Projects for School Districts within the Study Area

District Name	School Name	Building Name	Project Description
Sweetwater County School District No. 1	Desert ES/MS (K-8)	4 Plex	Demolish bldg. (utilities removed and empty for 15 to 20 years) 2,800 sq.ft.@$10/sq.ft.
Sweetwater County School District No. 1	Reliance ES	Old Building	Building (~ 14000 sq. ft) demolish or given away-Demolition cost @ $10/sq.ft.-80 years old
Sweetwater County School District No. 1	Reliance ES	Gym	Bldg. (~8000 sq. ft.) demolish or given away-Demolition cost @ $10/sq.ft.-70 years old
Sweetwater County School District No. 1	Reliance ES	Primary Building	Bldg. (~10000sq.ft.) demolish or given away-Demolition cost @ $10/sq.ft-50 years old

ES = Elementary School
MS = Middle School
PK = Pre-Kindergarten
sf = square feet

Source: State of Wyoming School Facilities Commission, Major & Minor Capital Improvement Projects, January 2005.

2.6 Public Safety

2.6.1 Location and Characteristics of Police, Fire, and Emergency Services

The four-county study area has a total of 35 fire stations, five highway patrol offices, 16 police stations, and four sheriff's departments. Table 2-27 displays the location of the local fire and police stations.

TABLE 2-27
Location of Fire and Police Stations in the Study Area

Fire Stations in Study Area			
Name	**Address**	**City**	**County**
Albany County Rural Fire Dist #1	Albany County Firefighters 2920 County Shop Rd. Laramie, WY 82070	Laramie	Albany
Laramie Fire Department	Station 1 & Administrative Offices 209 S. 4th Street Laramie, WY	Laramie	Albany
Laramie Fire Department	Station 2 and Public Meeting Room 1558 N. 23rd Street Laramie, WY	Laramie	Albany
Centennial Valley Volunteer Fire Department	P.O. Box 231 4 North Fork Rd. Centennial, WY 82055-0231	Centennial	Albany
Rock River Volunteer Fire Department	P.O. Box 94 Rock River, WY 82083-0094	Rock River	Albany
Vedauwoo Volunteer Fire Department	175 Honeytree Loop P.O. Box 65 Laramie, WY 82073	Laramie	Albany
Baggs Volunteer Fire Department	101 Second St. P.O. Box 291 Baggs, WY 82321-0291	Baggs	Carbon
Carbon County Fire Department	2620 E. Murry S P.O. Box 754 Rawlins, WY 82301	Rawlins	Carbon
Elk Mountain Volunteer Fire Department	201 Bridge St. P.O. Box 58 Elk Mountain, WY 82324	Elk Mountain	Carbon
Encampment/Riverside Volunteer Fire Department	622 Rankin St. P.O. Box 5 Encampment, WY 82325	Encampment	Carbon
Hanna Fire Department and EMS	111 2nd St. P.O. Box 44 Hanna, WY 82327	Hanna	Carbon

TABLE 2-27
Location of Fire and Police Stations in the Study Area

Medicine Bow Volunteer Fire Department	515 Sage St. P.O. Box 287 Medicine Bow, WY 82329-0287	Medicine Bow	Carbon
Rawlins Fire Department	320 W. Walnut St. P.O. Box 953 Rawlins, WY 82301	Rawlins	Carbon
Sinclair Refinery Volunteer Fire Department	100 E. Lincoln Avenue P.O. Box 277 Sinclair, WY 82334-0277	Sinclair	Carbon
Ryan Park Fire Department	HC 63 Box 9L 9L Saratoga, WY 82331	Saratoga	Carbon
Saratoga Volunteer Fire Department	210 E. Spring P.O. Box 96 Saratoga, WY 82331-0096	Saratoga	Carbon
Bar Nunn Fire Department	4820 N. Wardwell Ind. Ave. Bar Nunn, WY 82601	Bar Nunn	Natrona
Casper Fire Department	200 N. David St Casper, WY 82601	Casper	Natrona
Casper Mountain Fire Department	1000 Lemmers Rd. Casper, WY 82601	Casper	Natrona
Evansville Emergency Service	235 N. Curtis P.O. Box 158 Evansville, WY 82636	Evansville	Natrona
Mills Volunteer Fire Department	401 Wasatch Ave. P.O. Box 277 Mills, WY 82644	Mills	Natrona
Natrona County International Airport Fire Department	8500 Airport Pkwy. Casper, WY 82604	Casper	Natrona
Bairoil Fire Department	801 Blue Bell Ave. Bairoil, WY 82322	Bairoil	Sweetwater
Eden-Farson Fire Control Dist, Training Unit	P.O. Box 61 Farson, WY 82932	Farson	Sweetwater
Granger Volunteer Fire Department	12 W 2nd S P.O. Box 101 Granger, WY 82934	Granger	Sweetwater
Green River Fire Department	50 E Second N Green River, WY 82935	Green River	Sweetwater
Green River Fire Department	500 Shoshoni Ave. Green River, WY 82935	Green River	Sweetwater
Rock Springs Fire Department	600 College Dr. Rock Springs, WY 82901-5800	Rock Springs	Sweetwater
Superior Volunteer Fire and EMS	1 Division St. Superior, WY 82945	Superior	Sweetwater

TABLE 2-27
Location of Fire and Police Stations in the Study Area

Sweetwater County Fire Department	430 Blair Ave. Rock Springs, WY 82901	Rock Springs	Sweetwater
Sweetwater County Fire District #1	3010 College Dr. P.O. Box 2940 Rock Springs, WY 82902	Rock Springs	Sweetwater
Wamsutter Volunteer Fire Department	231 McCormick Box 95 Wamsutter, WY 82336-0095	Wamsutter	Sweetwater
Police Stations in Study Area			
Wyoming Highway Patrol	P.O. Box 1005 Laramie, WY 82073	Laramie	Albany
Wyoming Highway Patrol	P.O. Box 1040 Rawlins, WY 82301	Rawlins	Carbon
Wyoming Highway Patrol	P.O. Box Drawer 40 Elk Mountain, WY 82324	Elk Mountain	Carbon
Wyoming Highway Patrol	P.O. Box 1260 Rock Springs, WY 82902	Rock Springs	Sweetwater
Wyoming Highway Patrol	P.O. Box 2963 Casper, WY 82602	Casper	Natrona
Albany County Sheriff's Office	525 Grand Ave Courthouse #101 Laramie, Wyoming 82070	Laramie	Albany
Laramie Police Department	406 Ivinson Ave Laramie, Wyoming 82070	Laramie	Albany
Carbon County Sheriff's Office	P0 Box 190 Rawlins, Wyoming 82301	Rawlins	Carbon
Baggs Police Department	PO Box 190 Baggs, Wyoming 82321-0190	Baggs	Carbon
Hanna Marshal's Office	PO Box 309 301 South Adams Street Hanna, Wyoming 82327	Hanna	Carbon
Rawlins Police Department	215 5th St Rawlins, Wyoming 82301	Rawlins	Carbon
Saratoga Police Department	301 SW River Saratoga, Wyoming 82331	Saratoga	Carbon
Sinclair Police Department	PO Box 247 300 E Lincoln Ave Sinclair, Wyoming 82334	Sinclair	Carbon
Natrona County Sheriff's Department	201 N David Casper, Wyoming 82601	Casper	Natrona
Casper Police Department	Hall of Justice 201 North David Casper, WY 82601	Casper	Natrona

TABLE 2-27
Location of Fire and Police Stations in the Study Area

Evansville Police Department	235 N Curtis St Evansville, Wyoming 82636	Evansville	Natrona
Mills Police Department	704 Fourth St Mills, Wyoming 82644	Mills	Natrona
Sweetwater County Sheriff's Office	50 W Flaming Gorge Green River, Wyoming 82935	Green River	Sweetwater
Green River Police Department	50 E 2nd N St Green River, Wyoming 82935	Green River	Sweetwater
Rock Springs Police Department	221 C St Rock Springs, Wyoming 82901	Rock Springs	Sweetwater

Source: Wyoming Geographic Information System (GIS) data, 2005.
Source: Wyoming Department of Revenue Map & GIS Data Index, 3-2-2007, Fire Districts
Source: Firefightingnews.com
Source: www.usacops.com/wy/

Table 2-28 describes the level of service provided by the fire departments and the number and types of crime for the study area. The study area has over 200 full-time and volunteer fire fighters in each county totaling 940 personnel. Although Carbon County has the greatest number of fire fighters with 10 stations, Sweetwater County has 12 stations. Sweetwater County also has the only fire training center within the study area.

Actual police department staffing figures could not be obtained for the four-county study area.

There were a total of 6,828 crimes within the four-county study area in 2002, the latest year that crime information could be obtained. The most crime occurred in Natrona County with 3,349 events, followed by Sweetwater County with 1,603 events. In all counties, the most common crime is larceny, with 4,824 occurrences, followed by burglaries, 1,100 of which occurred in 2002.

TABLE 2-28
Public Safety Statistics for the Four-County Study Area

Public Safety Statistics	Albany County	Carbon County	Natrona County	Sweetwater County	Study Area
Fire Department (2001)					
Number of Full-Time Fire Fighters	80	149	87	114	430
Number of Volunteer Fire Fighters	180	128	114	88	510
Number of Fire Stations	6	10	7	12	35
Number of Fire-Training Centers	0	0	0	1	1
Crime (2002)					
Number of Murders (2002)	0	2	3	2	7
Number of Rapes (2002)	18	7	8	14	47
Number of Robberies (2002)	0	5	8	18	31
Number of Assaults (2002)	171	61	146	85	463
Number of Burglaries (2002)	146	82	670	202	1,100
Number of Larcenies (2002)	903	399	2,322	1,200	4,824
Number of Motor Vehicle Thefts (2002)	57	25	192	82	356
Total Crime (2002)	1,295	581	3,349	1,603	6,828

Source: Wyoming GIS Data. 2005
Source: Wyoming Atlas Crime

2.7 Health

2.7.1 Location and Characteristics of Health Facilities

There are seven hospitals located in the study area. There are two hospitals in three counties, Carbon County has one hospital. Figure 2-11 shows the location of these facilities within the study area.

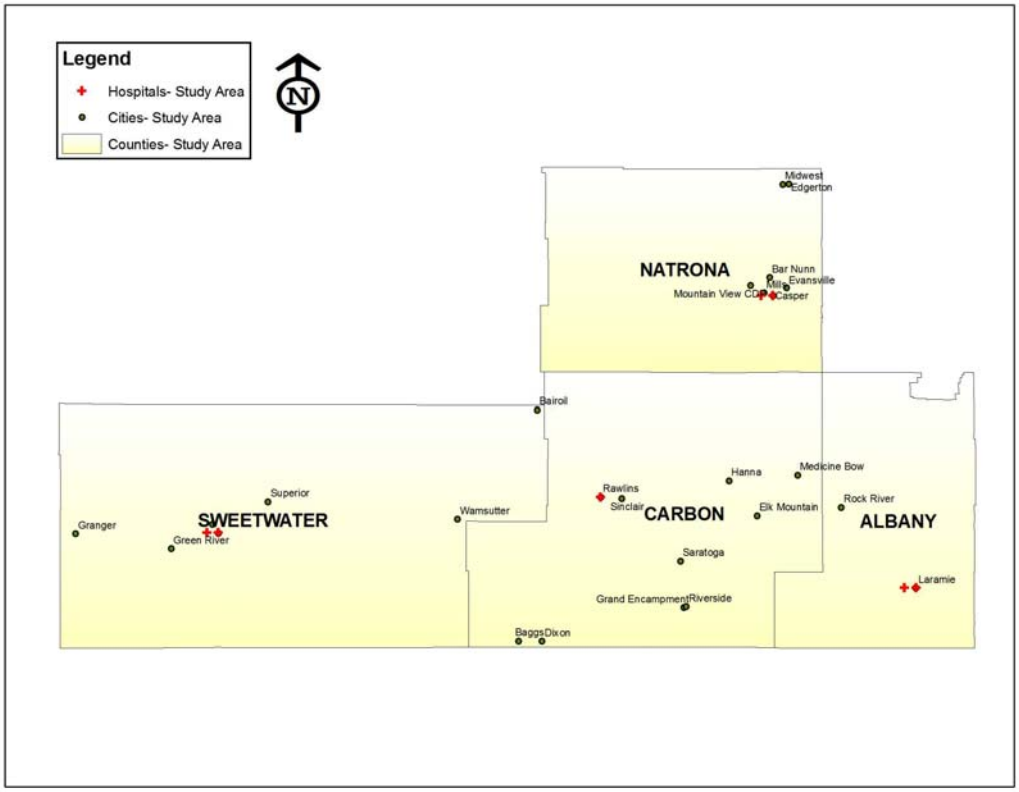

FIGURE 2-11
Location of Hospitals within the Study Area

In order to assess the direct impact on emergency medical treatment and emergency response, the number of ambulances within the Area of Impact was identified.

Some data such as number of long-term admissions per year, number of surgeries, and number of patients were unavailable.

Table 2-29 lists general hospital statistics for the study area.

TABLE 2-29
General Hospital Statistics for the Study Area

	Albany County	Carbon County	Natrona County	Sweetwater County
Number of Hospitals	1	1	1	1
Number of Acute Care Beds	NA	45	NA	NA
Average Bed Occupancy	99	35	201	99
Number of Acute Admissions per Year	NA	1,570	NA	NA
Number of Long-Term Admissions per Year	NA	NA	NA	NA
Number of Outpatient Visits	NA	29,400	NA	NA
Number of Inpatients	NA	1,760	NA	NA
Number of Surgeries	NA	700	NA	NA
Number of Emergency Room Visits per Year	15,309	8,200	25,689	19,092
Number of Swing Beds	119	35	0	0

Source: Personal Communication, 2004 and 2007. 2002 Wyoming GIS data.

Table 2-30 provides physician staffing levels for each county within the study area. Natrona County has the highest total number of physicians with 120. Of these, 105 work full time. Albany County has the second-highest number of physicians at 75, while Carbon County has the lowest number of physicians at 15. When general medical staff is included in the equation, Natrona County has the highest number of total medical staff at 813. Carbon County also has the lowest number of total medical staff at 121.

TABLE 2-30
Physician Staffing Levels by County within the Study Area

	Albany County	Carbon County	Natrona County	Sweetwater County
Total Number of Physicians	75	15	120	41
Number of Full-Time Physicians	58	14	105	40
Number of Part-Time Physicians	17	1	15	1
Total Number of General Medical Staff	73	106	693	180
Number of Full-Time General Medical Staff	64	104	507	142
Number of Part-Time General Medical Staff	9	2	186	38
Number of General Medical Staff Vacancies	4	3	37	11

Source: Wyoming Medical Professional Survey. Prepared for Wyoming Office of Rural Health by Wyoming Health Resource Network, Inc. and Wyoming Center for Business & Economic Analysis, LLC. October 2004.

Figure 2-12 shows the physician staffing levels for each county within the study area, including the current number of vacancies. Natrona County currently has the highest number of vacancies among its medical staff at 37, followed by Sweetwater County with 11. Albany and Carbon Counties have the lowest number of vacancies at four and three, respectively.

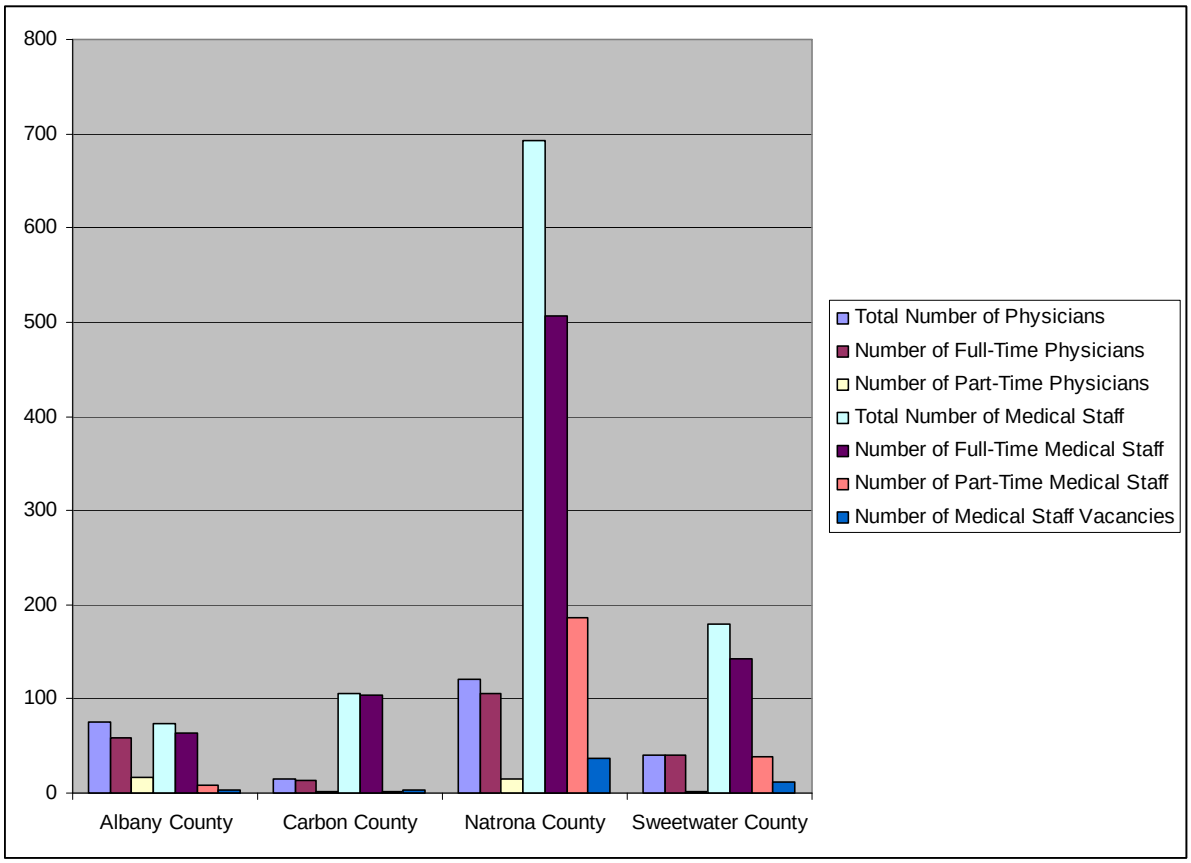

FIGURE 2-12
Physician Staffing Levels within the Study Area

Table 2-31 provides information on the number of full-time and part time physicians in each county within the study area as well as the ratio of physicians to the county population. The numbers of specialists and primary care physicians were not available.

TABLE 2-31
Ratio of Physicians to County Population within the Study Area

Physicians to Population Ratio	Albany County	Carbon County	Natrona County	Sweetwater County
Total Number of Physicians (full-time and part-time)	75	15	120	41
Population (2005)	31,600	15,320	67,980	36,160
Number of Physicians per 1,000 Population (2005)	2.37	0.98	1.77	1.13

Source: Wyoming Medical Professional Survey. Prepared for Wyoming Office of Rural Health by Wyoming Health Resource Network, Inc. and Wyoming Center for Business & Economic Analysis, LLC. October 2004.

2.7.2 Health Needs of the Existing Population

The level of services may be impacted in the near future by the aging population. National and state trends show aging of the population coincident with the "baby boom" generation moving into retirement years. This aging population will likely increase the demand for health services. The cost of health care may also increase due to this aging population. This fact is also echoed in *Employment Outlook: 2010* prepared by the Wyoming DOE, which states:

> "…the leading edge of the boom generation (15 percent of Wyoming's population) will most likely need more health services (associated with maturity) on a per capita basis than the nation. On a proportional basis, health care costs may rise more quickly in Wyoming than the nation due, in part, simply to differences in demographics." (p.4).

Therefore, it seems likely that health care will become an increasingly important issue in the next few years in each of these counties as well as for the entire state.

2.8 Municipal Services

2.8.1 Location and Characteristics of Municipal Facilities

The five primary municipal services examined in this report that are provided to citizens within the four-county study area were the following:

- Electricity
- Natural gas
- Water
- Wastewater treatment
- Waste disposal

Table 2-32 lists the electricity and natural gas suppliers within the study area and the counties and number of customers served, if available. There are seven primary suppliers of electricity for the four-county area.

TABLE 2-32
Electricity and Natural Gas Suppliers within the Study Area

Company	Counties Served	Service
PacifiCorp	Natrona County, Carbon County, Sweetwater County, Albany County	Electricity
Kinder Morgan	Natrona County, Albany County, Carbon County, Sweetwater County	Natural Gas
High Plains Power	Natrona County, Carbon County	Electricity
Carbon Power & Light	Carbon County, Albany County	Electricity
Yampa Valley EA	Carbon County	Electricity
Bridger Valley EA	Sweetwater County	Electricity
Wheatland REA	Albany County	Electricity
High West Energy	Albany County	Electricity
Town of Walden	Albany County	Natural Gas
Questar Gas Co.	Sweetwater County	Natural Gas

Source: Wyoming Public Service Commission. Wyoming Gas Utilities Certified Areas. March 2003.

2.8.1.1 Water

Water in the study area is provided through municipal water services in cities and more densely populated areas. Cities and towns in the study area that operate and maintain a municipal water supply include Laramie and Rock River in Albany County; Baggs, Dixon, Elk Mountain, Encampment, Hanna, Medicine Bow, Rawlins, Saratoga, and Sinclair in Carbon County; Casper, Edgerton, Evansville, Midwest, and Mills in Natrona County; and Bairoil, Granger, Green River, Rock Springs, Superior, and Wamsutter in Sweetwater County. Private wells serve the remaining, more rural portions of each of these counties.

2.8.1.2 Wastewater

Table 2-33 lists the wastewater treatment facilities in the study area. It should be noted that the list does not include all facilities that do not serve permanent populations, so facilities located in schools may not be included in the list. In addition, wastewater in more rural areas is discharged to private leaching fields or septic systems.

Natrona County has the largest population of all of the counties within the study area and has the most wastewater treatment facilities. The county has 48 facilities serving 71,410 customers. The largest facility is the Casper Board of Public Utilities wastewater treatment plant, which serves almost 54,500 customers.

Sweetwater County has 43 facilities and serves the second highest number of customers. The six facilities serve 47,751 persons. The largest facility is the City of Rock Springs, serving 19,050 persons.

Albany County's 28 wastewater treatment facilities serve 33,940 customers, the third highest number of customers within the study area. Carbon County's 29 facilities serve the least number of customers, at 17,094.

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
Antelope Ridge H.O.A	Albany	50	Groundwater	Active
Centennial Water and Sewer	Albany	150	Groundwater	Active
Country Meadow Estates	Albany	375	Groundwater	Active
Laramie, City of	Albany	28,000	Surface water	Active
Nine Mile Water and Sanitation District	Albany	198	Purch surface water	Active
Rock River, Town of	Albany	235	Surface water	Active
Seven Mile Water & Sewer Dist.	Albany	90	Purch surface water	Active
South Laramie W&S District	Albany	550	Purch surface water	Active
Wyoming Technical Institute	Albany	560	Groundwater	Active
Cathedral Home	Albany	55	Groundwater	Active
Mountain Cement Company	Albany	85	Groundwater	Active
Albany Lodge	Albany	25	Groundwater	Active
Camp Grace/Fletcher Park Baptist Youth	Albany	250	Groundwater	Active
Cavalryman, The	Albany	100	Groundwater	Active
Cenex #4 Gas Stop	Albany	250	Groundwater	Active
Flying X Ranch Mobile Home Park	Albany	300	Groundwater	Active
Medicine Bow NF Hidden Vall PG	Albany	30	Groundwater	Active
Medicine Bow NF Mirror Lake CG	Albany	250	Groundwater	Active
Medicine Bow NF Nash Fork CG	Albany	30	Groundwater	Active
Medicine Bow NF Rob Roy Upper CG Loop	Albany	90	Groundwater	Active
Medicine Bow NF Rob Roy Well #1	Albany	32	Groundwater	Active
Medicine Bow NF Vedauwoo CG	Albany	780	Groundwater	Active
Six K Incorporated	Albany	75	Groundwater	Active
Snowy Mountain Lodge	Albany	25	Groundwater	Active
Snowy Range Ski Area	Albany	180	Groundwater	Active
Vee Bar Guest Ranch	Albany	25	Groundwater	Active
WY Trans Dept Meridan RA	Albany	150	Groundwater	Active
WY Trans Dept Summit Rest Area	Albany	1,000	Groundwater	Active

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
Total	**28**	**33,940**		
Baggs, Town of	Carbon	490	Groundwater under infl of surface water	Active
Dixon Water System, Town of	Carbon	78	Surface water	Active
Elk Mountain, Town of	Carbon	186	Groundwater	Active
Encampment, Town of	Carbon	490	Surface water	Active
Hanna, Town of	Carbon	950	Surface water	Active
Medicine Bow, Town of	Carbon	270	Groundwater	Active
Rawlins Water Supply, City of	Carbon	9,006	Surface water	Active
Saratoga, Town of	Carbon	2,000	Surface water	Active
Sierra Madre JPB	Carbon	180	Groundwater	Active
Sinclair, Town of	Carbon	423	Purch surface water	Active
Flying J Travel Plaza	Carbon	978	Groundwater	Active
A Bar A Ranch	Carbon	150	Groundwater	Active
Arlington Outpost	Carbon	50	Groundwater	Active
Brush Creek Ranch	Carbon	33	Groundwater	Active
Deer Haven Mobile Home Park	Carbon	35	Groundwater	Active
Med Bow NF-S Brush CR CG-Upper	Carbon	40	Groundwater	Active
Med Bow NF-S Brush CR CG-Lower	Carbon	40	Groundwater	Active
Medicine Bow Lodge	Carbon	30	Groundwater	Active
Medicine Bow NF Ryan Park CG	Carbon	40	Groundwater	Active
Medicine Bow NF-Hog Park CG	Carbon	50	Groundwater	Active
Medicine Bow NF-BR CRK/Hayden	Carbon	50	Groundwater	Active
Old Baldy Club	Carbon	100	Purch surface water	Active
Seminoe Boat Club, Inc.	Carbon	200	Groundwater	Active
Sinclair Wyoming Refining Company	Carbon	130	Surface water	Active
The Place	Carbon	70	Groundwater	Active
Three Forks- Muddy Gap Service	Carbon	25	Groundwater	Active
WY Trans Dept FT Steele RA	Carbon	300	Surface water	Active
WY Trans Dept Shirley RIM RA	Carbon	100	Groundwater	Active
WY Trans Dept Wagonhound RA	Carbon	600	Groundwater	Active

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
Total	**29**	**17,094**		
Air Base Acres	Natrona	250	Purch surface water	Active
Alcova Dam Trailer Park	Natrona	45	Groundwater	Active
Broken Wrench LLC	Natrona	50	Groundwater	Active
Casper Board of Pub Utilities	Natrona	54,500	Purch surface water	Active
Central WY Reg Water Sys JPB	Natrona	25	Groundwater under infl of surface water	Active
Countryside Court	Natrona	125	Groundwater	Active
Edgerton, Town of	Natrona	169	Purch surface water	Active
Evansville, Town of	Natrona	2,200	Surface water	Active
Lakeview Improvement & Service District	Natrona	45	Purch surface water	Active
Midwest, Town of	Natrona	408	Purch surface water	Active
Mills, Town of	Natrona	3,200	Surface water	Active
Natrona County Int'l Airport	Natrona	312	Purch surface water	Active
Pioneer Water and Sewer District	Natrona	450	Purch surface water	Active
Pleasant View Water Company	Natrona	130	Purch surface water	Active
Poison Spider Improvement & Services Distr.	Natrona	100	Purch surface water	Active
Riverside Trailer Court	Natrona	155	Groundwater	Active
Sandy Lake Estates- ISD	Natrona	150	Purch surface water	Active
South Riverside Acres Water Impr Dist	Natrona	50	Groundwater	Active
Thirty-Three Mile Road I & SD	Natrona	150	Purch surface water	Active
Vista West Water Company	Natrona	1,600	Purch surface water	Active
Wardwell Water & Sewer Dist.	Natrona	2,100	Purch surface water	Active
North Platte Water & Sewer Dis	Natrona	2,000	Purch surface water	Active
U.S. Naval Res #3- Dept of Energy	Natrona	30	Purch surface water	Active
Alcova Lakeview Estates I	Natrona	38	Groundwater	Active
Alcova Lakeview Estate II	Natrona	24	Groundwater	Active
BLM Lodgepole Campground	Natrona	25	Groundwater	Active
Camp Sacajawea	Natrona	75	Groundwater	Active
Camp Wyoba and Lions Clubs	Natrona	140	Groundwater under infl of surface water	Active

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
Eagle Creek RV & Trailer Park	Natrona	25	Groundwater	Active
EKW State Park- Cottonwood	Natrona	25	Groundwater	Active
EKW State Park- HQ	Natrona	25	Groundwater	Active
EKW State Park- Platte River	Natrona	25	Groundwater	Active
Goose Egg Inn	Natrona	40	Groundwater	Active
Hogadon Ski Area	Natrona	300	Groundwater	Active
Lord of Lords Lutheran Church	Natrona	82	Groundwater	Active
MHVC 66 Ranch	Natrona	25	Groundwater	Active
MHVC Cherry Creek CG	Natrona	25	Groundwater	Active
MHVC Jackson CG	Natrona	25	Groundwater	Active
MHVC Visitors Center	Natrona	277	Groundwater	Active
Mills Spring Camp- 7th Day Adv.	Natrona	200	Groundwater	Active
Natrona County Park Beartrap	Natrona	50	Groundwater	Active
Natrona County Parks- Alcova Park	Natrona	800	Groundwater	Active
North 40 Lounge & Supper Club	Natrona	40	Groundwater	Active
Powder River Area Well	Natrona	50	Groundwater	Active
Sloanes General Store	Natrona	150	Groundwater	Active
Sunset Grill	Natrona	50	Groundwater	Active
WY Trans Dept Independence RA	Natrona	350	Groundwater	Active
WY Trans Dept Waltman RA	Natrona	300	Groundwater	Active
Total	**48**	**71,410**		
Bairoil, Town of	Sweetwater	150	Groundwater	Active
BP Man Camp- Wamsutter	Sweetwater	400	Groundwater	Active
Clearview Improvement Service	Sweetwater	400	Purch surface water	Active
Granger, Town of	Sweetwater	160	Surface water	Active
Green River, City of	Sweetwater	11,808	Purch surface water	Active
Jamestown-Rio Vista Water & Sewer	Sweetwater	600	Surface water	Active
Little America Hotels & Resorts, Inc./	Sweetwater	2,000	Surface water	Active
Pioneer Mobile Home Park	Sweetwater	1,500	Purch surface water	Active
Point of Rocks Mercantile	Sweetwater	100	Groundwater	Active
Rock Springs, City of	Sweetwater	19,050	Purch surface water	Active

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
Rock Springs/Green River JP	Sweetwater	25	Surface water	Active
Sandy Crossing Enterprises	Sweetwater	80	Groundwater	Active
Skyline Village Mobile Home Park	Sweetwater	900	Purch surface water	Active
Superior, Town of	Sweetwater	250	Groundwater	Active
Ten Mile Water & Sewer Dist.	Sweetwater	250	Purch surface water	Active
Wamsutter, Town of	Sweetwater	330	Groundwater	Active
White Mt. Water & Sewer Dist.	Sweetwater	3,000	Purch surface water	Active
Black Butte Coal Co.	Sweetwater	177	Groundwater	Active
Farson Eden School	Sweetwater	180	Groundwater	Active
FMC Corporation	Sweetwater	838	Surface water	Active
FMC Granger	Sweetwater	63	Surface water	Active
General Chemical Corporation	Sweetwater	781	Surface water	Active
Jim Bridger Power Plant	Sweetwater	400	Surface water	Active
McKinnon School	Sweetwater	33	Groundwater	Active
OCI Wyoming, LP	Sweetwater	450	Surface water	Active
Simplot Phosphates LLC	Sweetwater	190	Purch surface water	Active
Solvay Chemicals Inc.	Sweetwater	392	Surface water	Active
Sweetwater County Airport	Sweetwater	100	Purch surface water	Active
Ashley NF Buckbrd Crossing CG	Sweetwater	62	Surface water	Active
Ashley NF Firehole Rec Area	Sweetwater	100	Groundwater	Active
BLM Fontenelle Creek Campground	Sweetwater	25	Groundwater	Active
Cottownwood Corner	Sweetwater	25	Groundwater	Active
Country Burgers	Sweetwater	50	Groundwater	Active
Eaton Investments	Sweetwater	27	Groundwater	Active
Eden Saloon	Sweetwater	25	Groundwater	Active
Mitch’s Café	Sweetwater	25	Groundwater	Active
Rolling Green Country Club	Sweetwater	65	Groundwater under infl of surface water	Active
Sweetwater Co. Pioneer Trailer Park	Sweetwater	100	Surface water	Active
Sweetwater County Big Sandy Park	Sweetwater	40	Groundwater	Active
Sweetwater County Picnic Grounds	Sweetwater	100	Surface water	Active
WY Trans Dept Bitter Creek East	Sweetwater	1,000	Groundwater	Active

TABLE 2-33
Water and Wastewater Facilities within the Study Area

Water System Name	Principal County Served	Population Served	Primary Water Source Type	System Status
WY Trans Dept Bitter Creek West	Sweetwater	1,000	Groundwater	Active
WY Trans Dept Star Valley	Sweetwater	500	Groundwater	Active
Total	**43**	**47,751**		

Source: EPA Enviromapper. Accessed March 5, 2007. http://www.epa.gov/enviro/

Table 2-34 lists the characteristics of the waste disposal facilities in the study area, including the type of waste treated and whether the facility is currently active or proposed. The types of facilities in the list include industrial landfills; solid waste treatment, storage and disposal (SWTSD) facilities; and Type I and Type II municipal waste facilities.

TABLE 2-34
Waste Disposal Facilities within the Study Area

Facility Name	Facility Type	Status	County
Ark Recycling Services	SW TSD	Active	Albany
Bosler	Type II Municipal	Historic	Albany
CIG- Laramie Compressor Station	SW TSD	Proposed	Albany
Laramie Landfill	Type I Municipal	Active	Albany
Mountain Cement Ind. #2	Industrial Landfill	Proposed	Albany
Rock River #1	Type II Municipal	Historic	Albany
Rock River #2	Type II Municipal	Active	Albany
Union Pacific Railroad, Laramie Tie Plant	Hazardous Waste TSD	Active	Albany
Western Research Institute	SW TSD	Active	Albany
WR Metals Industries, Inc	Hazardous Waste TSD	Active	Albany
Facility Name	**Facility Type**	**Status**	**County**
Sinclair (8 sites)	2 sites: Type II Municipal 4 sites: Industrial Landfill 2 sites: TSD	1 site: Historic 3 sites: Closed 4 sites: Active	Carbon
Cheyenne Water Project	Industrial Landfill	Historic	Carbon
Rock River #1	Industrial Landfill	Historic	Carbon
Echo Springs	SW TSD	Active	Carbon
Baggs SWDD	Type I Municipal	Active	Carbon
Rawlins	Type I Municipal	Active	Carbon

TABLE 2-34
Waste Disposal Facilities within the Study Area

Facility Name	Facility Type	Status	County
Elk Mountain	Type II Municipal	Historic	Carbon
Elmo	Type II Municipal	Historic	Carbon
Hanna	Type II Municipal	Active	Carbon
Medicine Bow	Type II Municipal	Historic	Carbon
Saratoga	Type II Municipal	Active	Carbon
Facility Name	**Facility Type**	**Status**	**County**
SWACO, Casper	Hazardous Waste	Active	Natrona
Texaco Former Casper Refinery	Hazardous Waste	Active	Natrona
FMC Energy Services	Hazardous Waste TSD	Active	Natrona
Little America Refining Company	Hazardous Waste TSD	Active	Natrona
Land Treatment Facility, Casper	Industrial Landfill	Active	Natrona
Naval Petroleum Reserve Ind #2	Industrial Landfill	Active	Natrona
Salt Creek S. Unit	Industrial Landfill	Historic	Natrona
Baler/Transfer Facility	SW TSD	Active	Natrona
Black Hills Trucking-Casper Terminal	SW TSD	Active	Natrona
Mobile Concrete	SW TSD	Active	Natrona
PCS Treatment Facility-Casper	SW TSD	Proposed	Natrona
Robinson Contracting – UST	SW TSD	Active	Natrona
True Drilling	SW TSD	Active	Natrona
Used Oil Storage Facility	SW TSD	Proposed	Natrona
Wyoming Tire, Inc.	SW TSD	Active	Natrona
Casper Balefill	Type I Municipal	Active	Natrona
Central Wyoming Regional Landfill	Type I Municipal	Proposed	Natrona
Evansville	Type II Municipal	Historic	Natrona
Midwest Edgerton #2	Type II Municipal	Active	Natrona
Natrona City Parks- Pathfinder Reservoir	Type II Municipal	Historic	Natrona
Facility Name	**Facility Type**	**Status**	**County**
Anderson C & Son Trucking	Hazardous Waste TSD	Active	Sweetwater
Bairoil LTF- Formerly Amoco	Industrial Landfill	Active	Sweetwater
Church & Dwight Ind. #1	Industrial Landfill	Historic	Sweetwater
Church & Dwight Ind. #2	Industrial Landfill	Active	Sweetwater
CIG- Table Rock	Industrial Landfill	Historic	Sweetwater

TABLE 2-34
Waste Disposal Facilities within the Study Area

Facility Name	Facility Type	Status	County
Green River	Industrial Landfill	Historic	Sweetwater
Little America	Industrial Landfill	Historic	Sweetwater
PacifiCorp- Bridger Power Plant	Industrial Landfill	Active	Sweetwater
Sludge/Dewater/Drying Site	Industrial Landfill	Historic	Sweetwater
Sweetwater Resources, Inc.	Industrial Landfill	Historic	Sweetwater
U.P.R.R- Brady Gas Plant	Industrial Landfill	Historic	Sweetwater
Duke Energy Field Services, Emigrant Trail	Industrial Storage	Active	Sweetwater
Charles R Jacob	SW TSD	Active	Sweetwater
Mining Services International	SW TSD	Proposed	Sweetwater
Nelson Refining Systems	SW TSD	Active	Sweetwater
PacifiCorp- Jim Bridger Power Plant	SW TSD	Active	Sweetwater
Rock Springs TTSF	SW TSD	Active	Sweetwater
Universal Compression, Inc.	SW TSD	Active	Sweetwater
Farson	Type I Municipal	Historic	Sweetwater
Green River San #1	Type I Municipal	Active	Sweetwater
Green River San #2- Proposed	Type I Municipal	Proposed	Sweetwater
Rock Springs	Type I Municipal	Active	Sweetwater
Bairoil #1	Type II Municipal	Historic	Sweetwater
Bitter Creek	Type II Municipal	Historic	Sweetwater
Eden Valley SWDD	Type II Municipal	Active	Sweetwater
Granger #2- Proposed	Type II Municipal	Historic-Proposed	Sweetwater
Point of Rocks	Type II Municipal	Closed	Sweetwater
Rock Springs (old site)	Type II Municipal	Historic	Sweetwater
Superior- Transfer Station	Type II Municipal	Active	Sweetwater
Wamsutter #1	Type II Municipal	Historic	Sweetwater
Wamsutter #2	Type II Municipal	Active	Sweetwater

Source: Wyoming State Solid and Hazardous Waste Division (SHWD). 2005. Internet Resources. Accessed March 2, 2007. http://deq.state.wy.us/shwd.htm

Figure 2-13 shows the breakdown of the total number of waste disposal facilities by county. Sweetwater and Natrona Counties have the most waste disposal facilities in the study area with 43 and 31, respectively. Albany County has the fewest with 12 facilities.

The predominant types of waste disposal facilities in the study area are industrial landfills and Type II municipal facilities. There are a total of 30 Type II municipal facilities and 31 industrial landfills in the study area. Sweetwater has the highest number of industrial landfills in the study area with 17. Carbon County has the second highest number of industrial landfills with seven, followed by Natrona County with 5 industrial landfills, and Albany County with two industrial landfills.

Sweetwater County also has the most Type II municipal waste disposal facilities with 12, followed by Carbon County with nine, Natrona County with six and Albany County with three.

Hazardous waste facilities are the least predominant in the study area with only nine in the four county area. There are five such facilities in Natrona County, three in Albany County, one in Sweetwater County, and zero in Carbon County.

There are 27 SWTSD facilities in the study area. With 13 facilities, Natrona County has the most within the study area followed by Sweetwater County with eight. Albany and Carbon County each have three SWTSD facilities.

There are a total of 10 Type 1 municipal facilities within the study area. Sweetwater County has five Type 1 municipal facilities, followed by Carbon and Natrona Counties, which each have two Type 1 municipal facilities, and Albany County has one Type 1 municipal facility.

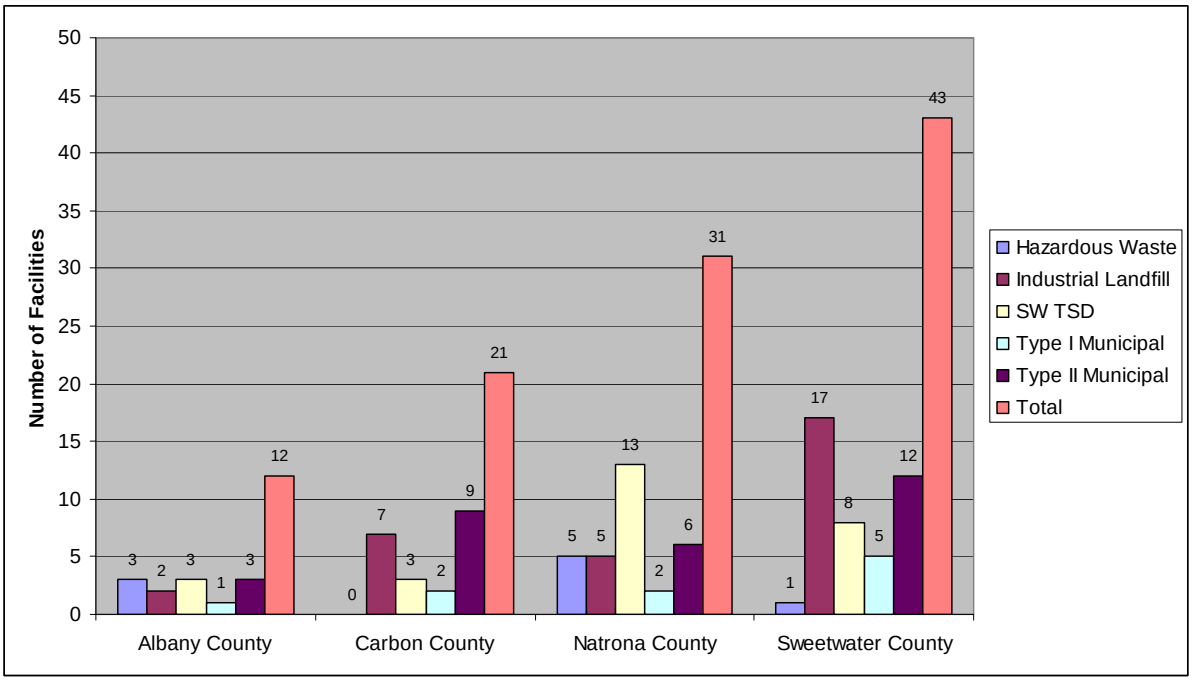

FIGURE 2-13
Types of Waste Disposal Facilities by County

2.9 Transportation

2.9.1 Identification of Major Facilities

Figure 2-14 shows the major transportation corridors within the study area. Interstate 25 (I-25) extends from the east of Natrona County and runs north from Casper. Interstate 80 (I-80) extends east-west through Albany County, Carbon County, and Sweetwater County.

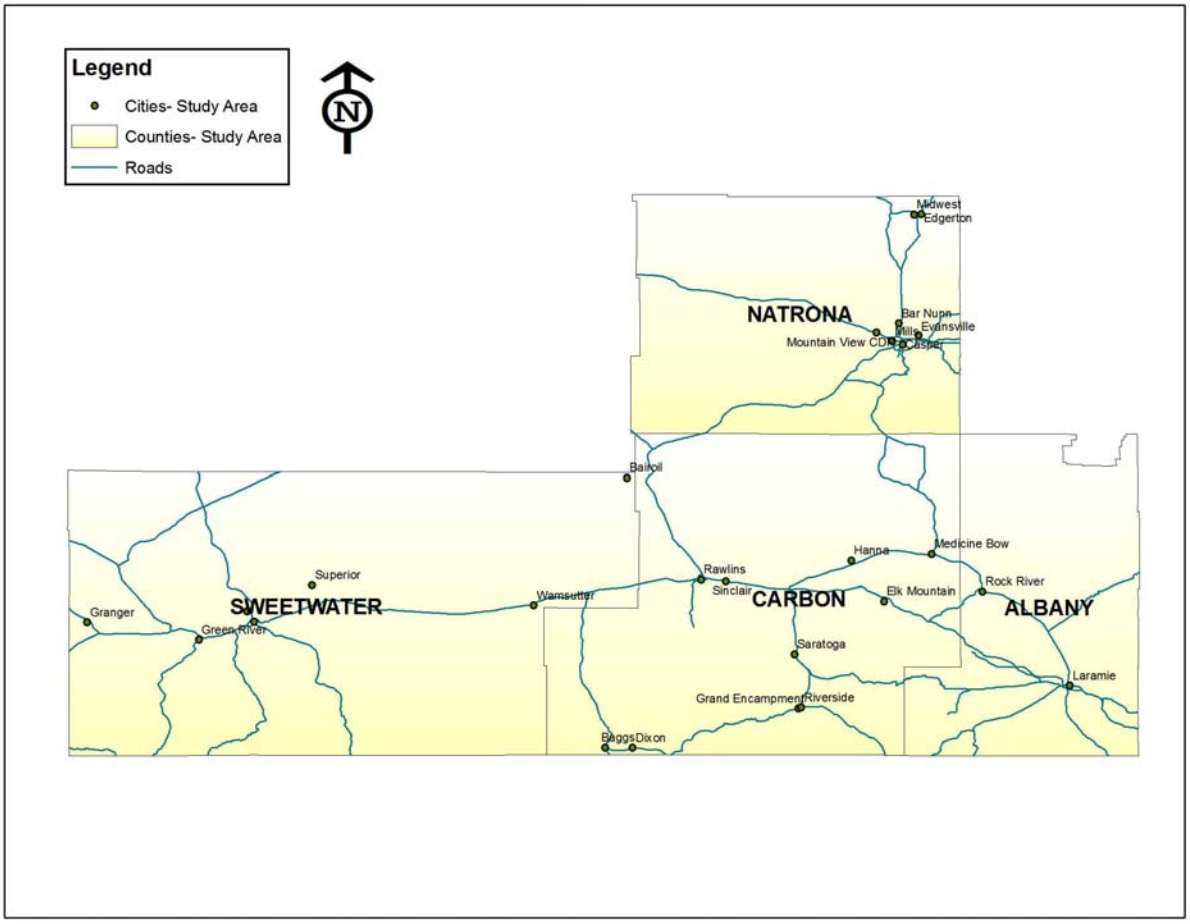

FIGURE 2-14
Major Roads and Highways within the Study Area

Table 2-35 details the major roads and highways in each county, their general direction, and the Annual Average Daily Traffic (AADT) volumes for all vehicles in 2002. More recent AADT information for these road segments is not available.

TABLE 2-35
Road Systems within the Four-County Study Area

County	Road	Type	General Direction	AADT Total (2002)
Albany	US 287	US Highway	North-South	3686
Albany	US 30	US Highway	East-West	16763
Albany	WYO130 & 230	State Highway	East-West	9989
Albany	I-80	Interstate	East-West	8399
Albany	US 30 & 287	US Highway	East-West	664
Carbon	I-80	Interstate	East-West	6948
Carbon	US 287 & WYO 789	US & State Highways	North-South	5345
Carbon	I-80	Interstate	East-West	9327
Carbon	WYO 220	State Highway	East-West	1401
Carbon	US 287 & WYO 789	US & State Highways	North-South	1966
Carbon	US 287 & WYO 789	US & State Highways	North-South	881
Natrona	I-25	Interstate	North-South	6335
Natrona	US 87	US Highway	East-West	1658
Natrona	WYO 255	State Highway	East-West	9509
Natrona	US 20 & 26 Bus.	US Highway	East-West	12221
Natrona	I-25	Interstate	North-South	4173
Natrona	US 20 & 26	US Highway	East-West	2009
Natrona	WYO 220	State Highway	North-South	2280
Natrona	WYO 487	State Highway	East-West	659
Natrona	WYO 220	State Highway	North-South	2858
Sweetwater	Elk St Viaduct, Rock Springs	NA	North-South	8014
Sweetwater	WYO 530	State Highway	North-South	NA
Sweetwater	I-80	Interstate	East-West	11861

Source: Wyoming Department of Transportation (WYDOT). 2002.

Figure 2-15 shows the total AADT on the major roads described above within the study area in 2002. Natrona County had the highest traffic volume with an AADT of 49,716. This is due to the higher volumes on Route 255 and U.S. Highway 20 and 26. Albany County has the second highest traffic volume with an AADT of 39,501. Carbon County had an AADT of 25,868, and Sweetwater County had the lowest traffic volume with AADT of 19,875.

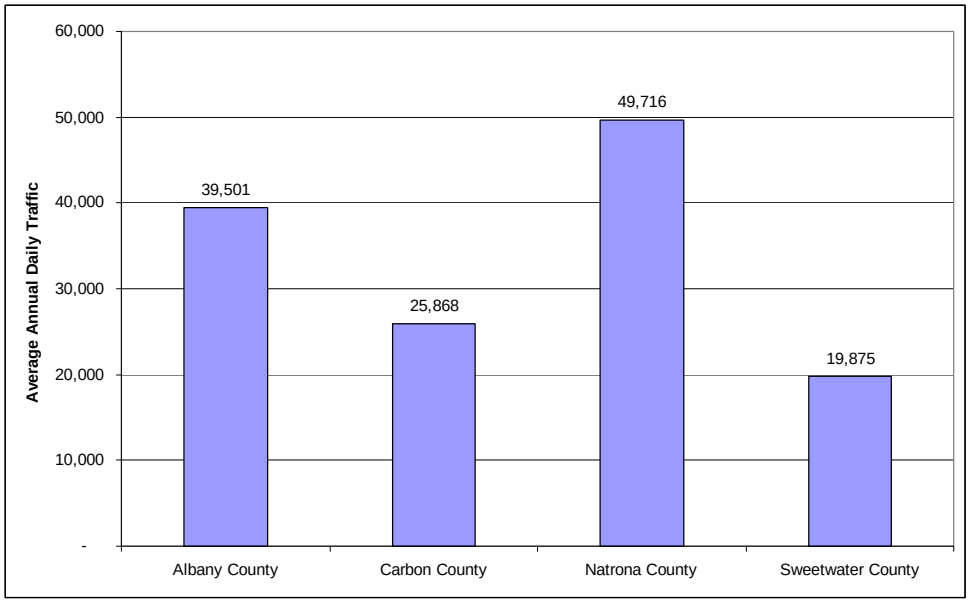

FIGURE 2-15
Total Average Annual Daily Traffic on Major Roads within the Study Area

Figure 2-16 shows the rail infrastructure within the study area. Major rail infrastructure is located in all counties within the study area.

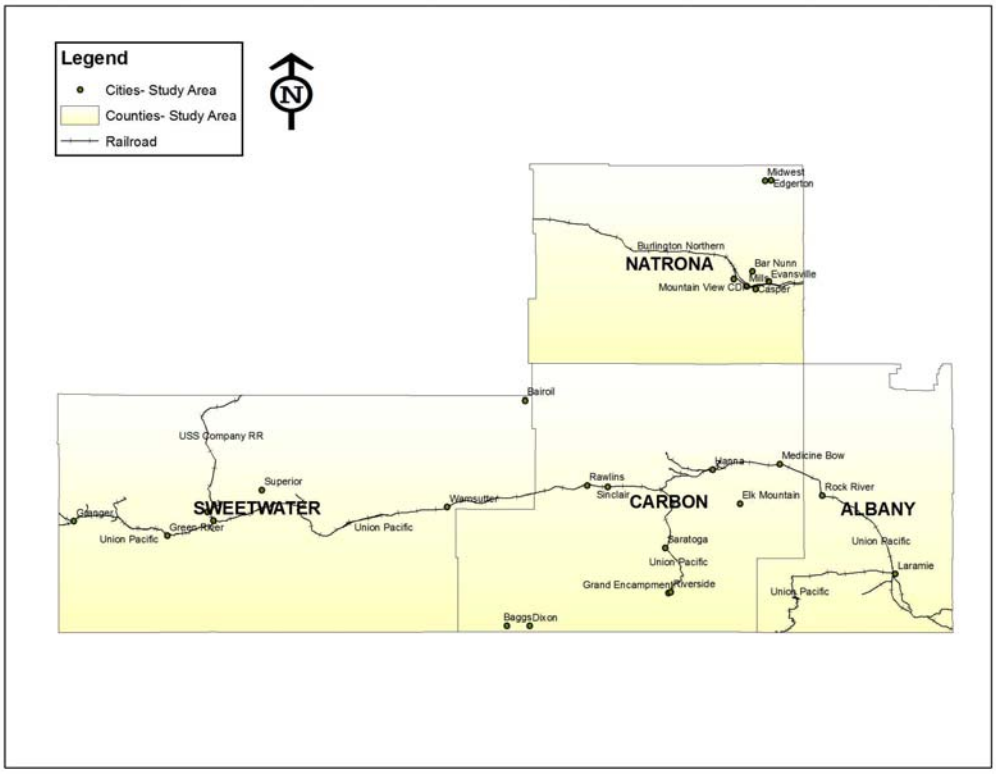

FIGURE 2-16
Location of Freight Rail Infrastructure within the Study Area

Table 2-36 details the properties of the freight rail infrastructure within the study area. There are approximately 655 miles of freight rail track within the study area. Sweetwater County has the largest rail infrastructure with 210 miles of track, followed by Albany County with 170 miles of track, then Carbon County with 160 miles of track, and Natrona County with 115 miles of track.

Union Pacific Railroad is the largest rail operator with 480 miles of track. Burlington Northern Railroad is the second largest rail operator in the study area, operating 88 miles of track. Other rail infrastructure is distributed throughout the four counties and is operated by several smaller rail companies.

TABLE 2-36
Freight Rail Infrastructure within the Study Area

County	Company	Miles of Track
Albany	Union Pacific Railroad	160
	Laramie Valley Railroad	10
	Total	170
Carbon	Union Pacific Railroad	126
	Union Pacific Spur	34
	Total	160
Natrona	Burlington Northern Railroad	88
	Cnw Railroad	20
	C and NW Railroad	7
	Total	115
Sweetwater	Union Pacific Railroad	160
	Uss Company Railroad	50
	Total	210
	Total Miles of Track within Study Area	655

Source: Wyoming Spatial Data Clearinghouse, 2001
Source: Wyoming Atlas Railroads

2.9.2 Review of Transportation Plans to Identify Planned Improvements

The WYDOT provides most of the transportation planning for the counties within the study area. Table 2-37 details WYDOT's planned construction activities in the four-county area. Activities primarily consist of widening, resurfacing, grading, paving, and bridge repair or replacement.

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TABLE 2-37
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Impacted Roads	County	Description	Length of Construction - Miles
LARA Marg/LARA River/WBL/BRDG	Interstate 80	Albany	Silica Fume Overlay	N/A
LARA STS/N 3rd St.	Rd 23	Albany	RPL Curb/Gutter/Sidewalk	0.09
LARA-COLO/TIE Siding SEC	Rd 23	Albany	Reconstruction/4 Lane Div Hwy	3.87
RKRV-BOXL/4-lane Sect/EBL #2	Rd 23	Albany	Pavement Overlay	8.71
RKRV-BOSL/4LN OVL/EBL	Rd 23	Albany	Pavement Overlay	16.24
LARA MARG/WUL-TELEPHON CYN	WUL-Telephone Canyon	Albany	PH 1 & 2 PE/Widen/Rehab/BR	9.14
LARA STS-NO 3rd/WYO Tech		Albany	PHS 1 PE/Turn Lanes	0.25
WALC-Lara/Quealy Dome	Quealy Dome Section	Albany	Reconstruction 3R	8.85
BOSL-WHTL/NO Sybille Cr	North Sybille Creek Section	Albany	Reconstruction	4.9
LARST/UPRR Overpass Sec	UPRR Overpass Section	Albany	Reconstruction	0.63
LARASt/UPRR Overpass #CIF	UPRR Overpass #CIF	Albany	Bridge Rehab	N/A
LARAST/GRND/15th-22nd	Grand Avenue/15th-22nd	Albany	CSA/Reconstruction	0.67
LARA-COLO/State Ln Sec	State Line Section	Albany	Widen Roadway/Reconstruction	5.74
MEDB-BOSL/ROCK R SEC	Rock River Section	Albany	Widen/Overlay/ISO-Reconstr	8.78
SNOW/CO LN SEC	County Line Section	Albany	Overlay	13.36
WALC-LARA/LARA W SEC	Laramie West Section	Albany	Resurface	11
LARA MARG/30th STR INT	30th Street Interchange	Albany	New Construction	0.4
LARA Marg/GRND Ave Int	Grand Avenue Interchange	Albany	Bridge Rehabilitation	N/A
LARA Marg/GRND Ave Sec	Grand Avenue Section	Albany	Widen & Overlay	3.55
LARA-COLO/BUTTES SEC	Buttes Section	Albany	Widen Roadway/Reconstruction	2.72
MEDG-BOSL/JCT No WBL	BOSL JCT North WBL	Albany	Widen & Overlay	7.72

TABLE 2-37
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Impacted Roads	County	Description	Length of Construction - Miles
LARA MARG/CURTIS ST INT	Curtis St Int/ +X Road 4200 .54	Albany	CSA/Repl Structure/Reconstruct	0.4
LARA-COLO/UPRR Sep SEC	UPRR Separation Section	Albany	Widen Roadway/Reconstruction	3.73
MEDB-BOSL/RK R SO WBL	Rock River South WBL	Albany	Widen & Overlay	8.52
LARA-COLO/LARA SO SEC	Laramie South Section	Albany	Widen Roadway/Reconstruction	4.95
LARA-COLO/LARAST STR SEC	Laramie Streets Section	Albany	Widen Roadway/Reconstruction	2.1
CENT-ALBY/ALBY	Albany Road	Albany	Widen & Overlay	10.94
Laramie		Albany	Extend R/W 12/30	
DEWAR DRIVE INTG/APW APV	SmUbn&Ubnzd Interstate 80	Sweetwater	Bridge Replacement	N/A
DEWAR DR INT-PILOT BUTTE INT	SmUbn&Ubnzd Interstate 80	Sweetwater	Resurfacing/Struc Repl/ITS WC	5.82
Pilot Butte Int (+107.06)	SmUbn&Ubnzd Interstate 80	Sweetwater	Enhancement	N/A
RKSP/DEWAR DR/STG 2	SmUbn&Ubnzd Interstate 53	Sweetwater	Reconstruction	0.32
GRRV-FONT/FONTENL E	Fontenelle East	Sweetwater	Reconstruction/3R	6.59
KEMM-GRNG/US 30/GRANGER East	US30	Sweetwater	Mill & Overlay	5.84
Lyman-Grng/Grng Jct	Granger Junction	Sweetwater	Reconstruction	0.8
RKSP-FARS/LTL Sandy	Little Sandy River Str. #BRK	Sweetwater	Bridge Rehabilitation	N/A
RKSP-RAWL/WAMS W	Wamsutter West	Sweetwater	Resurfacing/Reconstr/ITS	12
Dist 3/Brdg Rehab /07	Various Locations	Sweetwater	Bridge Rehabilitation	N/A
SW CO/MEANS Canal #ESK ESL	CR 4-10E & 4-10G/STR #ESK #ESL	Sweetwater	Bridge Replacement	N/A
SW CO/Middle Baxter Rd	Middle Baxter Rd/CR #4-45	Sweetwater	Reconstruction	N/A
SW Co/Salt Wells Cr #EPJ	Salt Wells Crk/Str #EPJ	Sweetwater	Bridge Replacement	N/A
Dist 3/PVMT Repair/07	Various Locations	Sweetwater	Concrete Pavement Repairs	N/A

TABLE 2-37
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Impacted Roads	County	Description	Length of Construction - Miles
RKSP-RAWL/TIPTON	Tipton Section	Sweetwater	Resurfacing	8.2
SW CO/GRRV #FJE	STR# FJE/CR 180-3/MP .5	Sweetwater	Bridge Replacement	N/A
FARS-LAND/EDEN CANAL	Eden Canal Section	Sweetwater	Widen/Overlay/ISO-Reconstr/ITS	10.1
RKSP/ARPT Rd	ARPT Rd.	Sweetwater	Widen/Overlay	4.66
FLMG/I-80 SO	I-80 South	Sweetwater	Widen/Overlay/ISO_Recon	3
GRRV-RKSP/FLAM G INT	Flaming Gorge Int/US191/#CVZ	Sweetwater	Bridge Replacement	N/A
GRR/WILKES & 2nd So	2nd South/4th-Uinta	Sweetwater	Pavement Rehabilitation	7
HIAW/SALT Wells Cr	Salt Wells Creek Section	Sweetwater	Widen & Overlay	10.51
FONT-FARS/RESURF		Sweetwater	Resurface	7.39
HIAW/SEC 1	Section 1	Sweetwater	Reconstruction	6.18
FARS-Land/CO LN SEC	County Line Section	Sweetwater	Reconstruction	10.31
FLMG/Utah Ln Sec	Utah Line Section	Sweetwater	Reconstruction	7.51
RKSP-Rawl/WAMS East	Wamsutter East	Sweetwater	Resurfacing	13.39
FLMG/I-80 Utah	I-80 - Utah Line	Sweetwater	Reconstruction	8.68
SUPR/Reconstr		Sweetwater	Reconstruction	7.3
CB CO/FTST Park/06	Rural Local System	Carbon	Gravel Rd Construction	N/A
CRST-BAGGS/W 789 OVRLY	WYO-789	Carbon	Level/Overlay/Chip Seal	9.63
WALC-SARA/JCT SO	Walcott Jct South	Carbon	Overlay/Chip Seal	8
(+P-021 3RD/CEDAR-SPRUCE)	SmUbn&Ubnzd Othr Prin Arterial 54	Carbon	CSA/Reconstruction	1
Hanna-ElkM/US30 to I-80	WYO-72/US30 to I-80	Carbon	Widen/Overlay/ISO-Reconstr	10.74
RAWL SOUTH/SAGE CR RD	Sage Creek Rd/U 0-2.27	Carbon	Widen & Overlay	10.47

TABLE 2-37
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Impacted Roads	County	Description	Length of Construction - Miles
RAWL/MURRAY/BYPAS-AIRPT	US 287 Bypass-Airport Road	Carbon	Reconstruction	N/A
RKSP-RAWL/RAWLINS W	Rawlins West-Surfacing	Carbon	MILL/LEVEL/OVERLAY/3R	12
RAWL MARG/Cedar Str Int/Stg 1	Cedar Street Interchange	Carbon	Replace Interchange/Stg 1	N/A
WALC-LARA/MEDB/EBL	Medicine Bow Section /EBL	Carbon	Resurface	12
MEDB-BOSL/MEDB E		Carbon	Widen & Overlay	11.5
CRST-BAGGS/Resurface	WY-789	Carbon	Resurface	10
RAWL-MUDG/BEL SPRG	Bell Springs Section	Carbon	Widen & Overlay/+Lanes	10.14
SARA-ENCT/SARA SO	Saratoga South	Carbon	Grading/Guardrail Upgrade	16.77
WALC-LARA/DANA RDG/EBL	Dana Ridge Section/EBL	Carbon	Concrete Rehabilitation	7
BAGGS-COLO/Widen&Resurf		Carbon	Widen & Resurface	3
RAWL MARG/CEDAR Str Int/Stg 2	Cedar Street Interchange	Carbon	WBL Realign & Widening/STG 2	1.15
BAGGS-ENCT/Battle Mtn	Battle Mountain Section	Carbon	ISO-Recon/widen/Ovly/3R	9.8
Snowbrush CR/PH 2	Brush Creek Section/PHS 2	Carbon	Reconstr/RETN Wall/Wetlands	2.4
RKSP-RAWL/RAW W	Rawlins West - Interchanges	Carbon	BR & Interchanges/3R & 4R	9.9
Dist 2/I-25 Mill & Overly	MP 39.75 - 76.00/+ MP 192-210 254-270	Natrona	Milling/Pavement Overlay	6.85
CASP/HAT Six Rd/Reconstr	Hat Six Road	Natrona	Reconstruction	1.08
GLNK-CASP/Hat Six Section		Natrona	Widen & Overlay/4R/ITS	9.86
SHRM/WYO 487/Ovrly	Wyo 487	Natrona	Level and Overlay	11.8
Casp STS/2nd/N David/N Popular		Natrona	Reconstruction	N/A
Casp/W Belt Loop/Sec 1	New P-021 Bypass/P-021-034 6.5	Natrona	New constr/Grading/Structures	N/A
Casp/Walsh Dr Ext	Walsh Dr Ext/PO Rd - Yellowstone	Natrona	New construction	N/A

TABLE 2-37
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Impacted Roads	County	Description	Length of Construction - Miles
MUDG-CASP/CASP So SEC	Narrows Section	Natrona	Reconstruction/4 Lane Div Hwy	5.4
Casp/CY & Popular	CY Ave .18 MI & Popular .21 Mi	Natrona	Reconstruct Intersection	0.22
Mills STS/Poison Spider Rd		Natrona	Reconstruction	N/A
CASP St/US-20/26 Spur MP 0-2.9	Shoshoni Connector	Natrona	Reconstruction	2.9
CASP STS/WYO-254/Salt Crk Hwy		Natrona	Reconstruction	0.5
CASP/W Belt Loop/Sec 2	New P-021 Bypass/P-021-034 6.5	Natrona	New construction/Surfacing	N/A
Casper Outer Drive	Casper Outer Drive	Natrona	Widen & Resurface	4.18
CASP/Robertson Rd	NCL-Poison Spider Rd	Natrona	Reconstruction	N/A
Smokey Gap - MIDW/Reconst		Natrona	Reconstruction/4R	7.99

Source: WYDOT Construction Report. Accessed May 4, 2005. http://wydotweb.state.wy.us State Transportation Improvement Program, 2005.

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2.9.3 Condition of Roadway Facilities

There were no roadways identified in the vicinity of the proposed project that are presently over capacity. The segment of County Road 1/3 adjacent to the proposed site is currently a two-lane, gravel road. It serves oil trucks, school buses, local residents, and summer tourists. Traffic volumes suggest that the level of service (LOS) on this road is good.

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SECTION 3.0

Impacts

3.1 Area of Impact Defined

As determined by a review of the larger, four-county study area, the Primary Area of Impact defined for the project can correctly be narrowed to Carbon County. The project team desires to maximize the benefits of the project to the local communities, while containing the impacts as much as possible. This is based on the following:

- Census 2000 Journey to Work data indicate that 90 percent of those who work in Carbon County also live in Carbon County. We anticipate that this trend will continue with the implementation of this project. Therefore, the number of workers who would actually commute to the site from outside of Carbon County is estimated to be about 10 percent.
- Every attempt will be made to house the imported workforce within Carbon County, thereby minimizing or eliminating any potentially negative impacts to the surrounding counties.

The project team believes that the more the workforce is integrated into the local community, the fewer associated social problems will result. This is due to the fact that social problems related to a transient workforce are generally related to isolation of the workforce.

While the intent of the project team is to ensure that adequate housing is available within Carbon County for its workforce, it is recognized that some members of the workforce may choose to reside outside of Carbon County temporarily. Therefore, a Secondary Area of Impact is defined as that area within a reasonable commute based on the commuting pattern identified in Section 1. For purposes of this analysis, the Secondary Area of Impact would be focused primarily on eastern Albany County and southern Natrona County including the cities of Casper and Laramie.

3.2 Project Employment

3.2.1 Projected Overall Employment Needs

3.2.1.1 Construction

The facility will require an estimated 2,000 coal-to-liquids plant workers and 307 coal mine workers for the Engineer-Procure-Construct (EPC) contractor and its subcontractors at the peak of construction. The total duration of employment greater than 1,500 workers is only anticipated to last 11 months, with the actual peak of 2,300 workers lasting for a much shorter duration.

Security personnel are assumed to be hired locally. Because security represents an insignificant fraction of the overall project and does not impact housing issues, this staff is not considered further in this analysis.

EPC workers will be needed in the following trade categories:

- Civil works
- Structural steel
- Equipment
- Piping
- Electrical
- Instrumentation
- Insulation/Paint

The total EPC man hours of labor required for the construction are estimated at 5,321,244 hours. It is estimated that the construction of the coal-to-liquids plant will require a workforce of approximately 2,000 at peak construction and 900 on average. For the construction of the coal mine, the required workforce is approximately 307 at peak construction and 226 on average. Figure 3-1 displays the number and types of workers required for construction of the coal-to-liquids plant during the estimated 3-year construction period.

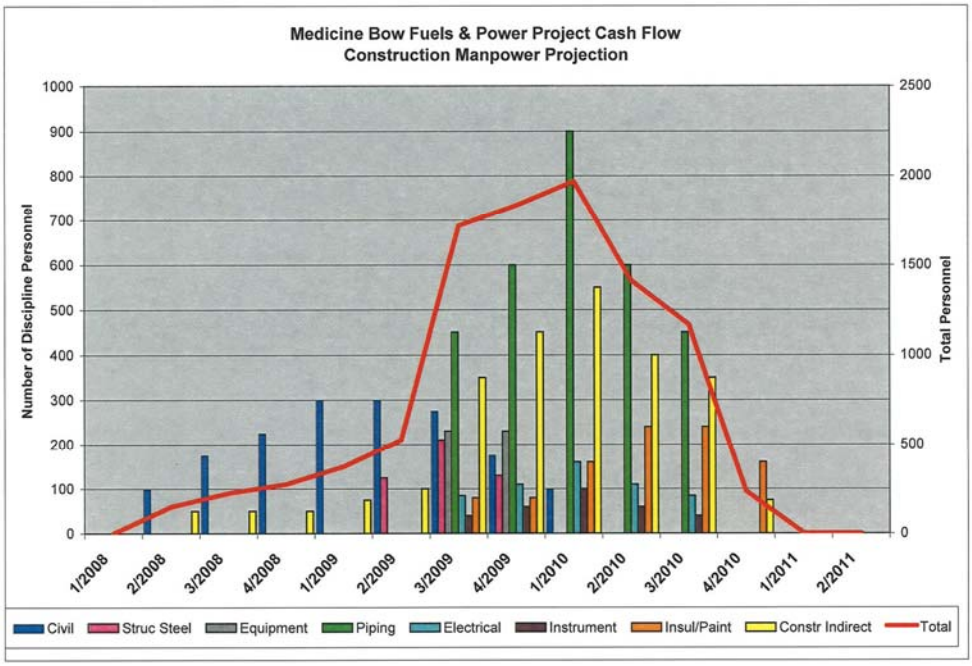

FIGURE 3-1
Workers by Month and Trade Type

The project is anticipated to require nearly 3 years for construction, from mid 2008 to mid 2011.

3.2.1.2 Operations

There will be a need for approximately 200 full-time workers for operation of the coal-to-liquids plant. The workers that will be required for plant operations include the following types:

- Operations
- Maintenance Workers
- Technical Support
- Administrative Support

There will be a need for approximately 250 skilled full-time workers to operate and maintain the underground mining equipment and coal-handling system. The workers that will be required for coal mine operations include these types:

- Operators and supervisors
- Maintenance workers
- Mechanics
- Plant manager
- Laboratory technicians
- Engineers
- Operations managers
- Administrative support
- Heavy equipment operators
- Instrument technicians
- Electrical technicians
- Health and safety
- Human resources
- Accounting
- Security

3.2.2 Wages

3.2.2.1 Construction

The estimated wages and average number and types of workers required for the EPC construction workforce are displayed in Table 3-1. These wages are somewhat higher than local wages paid for similar construction jobs, which should assist in recruitment of workers.

TABLE 3-1
Construction Workers and Estimated Wages

Trade	Estimated Mean Wage Workers	Estimated Mean Wage Within Study Area
Civil Works	19.03	17.23
Structural Steel	19.54	16.73
Equipment	22.45	17.32
Piping	22.96	20.13
Electrical	23.10	21.88
Instrumentation	24.61	21.58
Insulation/Paint	20.02	17.31

3.2.2.2 Operations

Table 3-2 displays the numbers and types of workers and estimated annual costs required for operations.

TABLE 3-2
Operations Workforce

Project Location	Operations Workforce Required	Estimated Annual Cost
Coal to Liquids Plant	200	$14,279,253
Coal Mine	250	$17,141,877

Source: Medicine Bow Estimates

3.2.3 Local and Imported Employment Estimates

3.2.3.1 Construction

Overall, the jobs hired locally represent 10 percent of the total employment, with imported labor representing 90 percent of the total. At peak construction, this results in 1,098 imported workers coming to Carbon County alone, 972 workers bringing families to Carbon County, and 230 local workers.

3.2.3.2 Operations

As noted previously, an operational workforce for the coal-to-liquids plant of 200 in addition to the operational force for the coal mine of 250 would be required for operations. The project team estimates that a large percentage of this workforce will be from the local area.

3.3 Project Benefits

3.3.1 Direct Benefits

Peak construction is anticipated to be 2010 for the proposed plant. This would produce construction jobs over a 3-year period, with 2,300 EPC jobs at peak construction. In addition, a total of 450 permanent jobs will be required for operations at both the plant and mine.

3.3.2 Indirect Benefits

In order to estimate the potential for indirect job creation in Carbon County and the Secondary Area of Impact, a regional economic analysis model was used. For this project, IMPLAN was used to estimate the indirect and induced impacts. Indirect and induced employment effects include the purchase of goods and services by firms involved with construction.

3.3.2.1 Construction

Peak EPC construction employment for the proposed plant would be approximately 2,000 workers for the coal-to-liquids plant and 307 workers for the coal mine. It is estimated that up to 637 indirect jobs (potentially temporary employment over 3 years) would be created as a result of the construction jobs.

3.3.2.2 Operations

During operations, the increase in permanent workforce of 200 persons for the coal-to-liquids plant and 250 persons for the coal mine, approximately 374 (140 for the coal-to-liquids plant and 234 for the coal mine) additional jobs are being created permanently in Carbon County and the Secondary Area of Impact.

Table 3-3 below summarizes the generated indirect employment.

TABLE 3-3
Indirect Employment Generated as the Result of Project Actions

Type of Project Activity	Number and Type of Direct Employment	Indirect Employment Created
Construction for Coal-to-Liquids Plant	2000 - Temporary	337 jobs
Construction for Coal Mine	307 - Temporary	301 jobs
Operations for Coal-to-Liquids Plant	200 - Permanent	140 jobs
Operations for Coal Mine	250 - Permanent	234 jobs

Source: CH2M HILL Projections

3.3.3 Tax Implications

Project benefits from a tax perspective would occur based on the ad valorem taxes that would be collected and the state and local sales and use taxes on purchases of goods required to complete the construction. Indirectly, the project would also increase the coal mined in the area of impact so that mineral severance taxes would also increase after commencement of operation of the project. Carbon County currently receives about 5 percent of the state total for mineral taxes. In 2006, Carbon County's mineral taxable valuation was $730,458,033.

Ad Valorem Taxes

For the period 2008 through 2102, it is estimated the total ad valorem tax revenue generated will be $9,830,000. The estimate incorporates the pollution control equipment exemption, 11.5 percent assessed value, and a 60.10 mill levy. The coal production from the mine during construction is subject to the Gross Production Ad Valorem tax and is included in the overall revenue estimate. The annual ad valorem tax estimate is shown in Table 3-4.

In addition to the ad valorem taxes, the mine coal production is subject to the state's mineral severance tax. The mine production will be taxed at the underground coal production rate of 3.75 percent of the gross value of the coal produced.

TABLE 3-4
Estimate of Ad Valorem Taxes Paid Per Year

Operation	2008	2009	2010	2011	2012	Total
CTL Plant	-	$450,000	$1,200,000	$2,500,000	$3,300,000	$7,450,000
Mine	-	-	$170,000	$410,000	$700,000	$1,280,000
Coal Production	-	-	-	-	$1,100,000	$1,100,000
Total	-	$450,000	$1,370,000	$2,910,000	$5,100,000	$9,830,000

Source: DKRW Advanced Fuels. Estimate based on CTL plant equipment value of $807 million and mine equipment value of $101 million. The annual estimate is based on equipment installed as of January 1 each year. The estimate utilized the pollution control exemption, a 11.5% assessed value and a mill levy rate of 60.10.

Sales and Use Tax

State sales and use taxes are 4 percent of the value of the goods on materials and supplies during construction. Carbon County also assesses a 1.0 percent County Option tax. The estimated total sales and use taxes that will be paid on the materials purchased for the construction of this project is $3,710,000. The estimate for each year is shown in Table 3-5.

TABLE 3-5
Estimate of Sales and Use Taxes Paid Per Year

Operation	2008	2009	2010	2011	2012	Total
Total for CTL and Mine	$450,000	$810,000	$1,500,000	$950,000	-	$3,710,000

Source: DKRW Advanced Fuels. Estimate includes state sales and use tax and county option tax.

3.4 Future Burdens on the Area of Impact Carrying Capacity

3.4.1 Carrying Capacity of the Area of Impact Without Project

This section analyzes how the available infrastructure (schools, housing, municipal services, health care, and transportation) would function with expected population growth in the Area of Impact if the project were not built. This allows a baseline to compare the additional burden of the project (in the following section) to what will be expected in the Area of Impact as a result of natural population growth.

3.4.1.1 Housing

The current and projected availability and affordability of housing in Carbon County are used to establish the carrying capacity of housing in the county as well as to determine whether the projected need for housing exceeds this carrying capacity.

The rough estimate of the potential housing need in Carbon County through 2025 is provided in Table 3-6. For a detailed explanation as to how these numbers were calculated, please see the discussion under Section 2.4, Housing.

TABLE 3-6
Projected Housing Gap for Carbon County, 2005-2025

Carbon County	2005	2010	2015	2020	2025
Households					
Number of Households	6,185	6,625	6,986	7,425	7,931
Number of Units	8,455	8,603	8,751	8,899	9,047
Projected Housing Gap	2,270	1,978	1,765	1,474	1,116
Renters					
Number of Renter Households	1,708	1,769	1,796	1,840	1,896
Estimated Number of Rental Units	2,449	2,492	2,534	2,577	2,620
Projected Rental Housing Gap	741	723	738	737	724
Homeowners					
Number of Homeowner Households	4,477	4,856	5,190	5,586	6,035
Estimated Number of Homeowner Units	6,006	6,111	6.217	6,322	6,427
Projected Homeowner Housing Gap	1,529	1,255	1,027	736	392

Source: All household projections and units for 2005 are from the Wyoming Housing Database Partnership. *A Profile of Demographics, Economics and Housing: Semiannual Report, Ending December 31, 2006*. March 2005.

Note: Negative numbers indicate a gap (shortage) of housing; positive numbers indicate a surplus of housing.

As shown in the table, Carbon County has a surplus in housing for both renter and homeowner households. Although a surplus, the overall housing gap gradually decreases through the year 2025. The rental unit gap remains fairly consistent contrary to the homeowner units, which decrease from 1,529 to 392.

Table 3-7 illustrates the number of owner-occupied and renter-occupied households depending on the income range. The income range from $50,000 to $74,000 has the highest owner-occupied households. This income range is higher then the median household income of $41,600 for homeowners. For renter-occupied households, the income range from $25,000 to $34,999 has the highest renter-occupied units, which is higher than the median household income of $24,931 for renters.

TABLE 3-7
Households by Income Range

	Owner Occupied		Renter Occupied	
Income Range	**Households**	**Percent**	**Households**	**Percent**
Less than $5,000	105	2.42	139	7.78
$5,000 to $9,999	229	5.27	243	13.61
$10,000 to $14,999	328	7.55	153	8.57
$15,000 to $19,999	278	6.40	201	11.25
$20,000 to $24,999	294	6.77	159	8.90
$25,000 to $34,999	581	13.38	326	18.25
$35,000 to $49,999	836	19.25	271	15.17
$50,000 to $74,999	1,014	23.35	208	11.65
$75,000 to $99,999	381	8.77	49	2.74
$100,000 to $149,999	183	4.21	22	1.23
$150,000 or more	114	2.62	15	0.84
Total	4,343	100.00	1,786	100.00
Median Household Income	$41,600		$24,931	

Source: Wyoming Housing Database Partnership

Table 3-8 illustrates the average rental cost for apartments, mobile home lots, mobile homes, and houses within Carbon County from 2005 to 2006. Each type of housing unit has increased since 2005 and is anticipated to remain higher within the State of Wyoming compared to national levels until the housing supply meets the ongoing demand.

TABLE 3-8
Average Rental Costs in Carbon County

	2005	2006	Percent Change
Apartment	$507	$619	22.2%
Mobile Home Lot	$128	$138	7.8%
Mobile Home	$546	$625	14.5%
House	$396	$564	42.3%

Source: Wyoming Cost of Living for the Second Quarter, 2006, Department of Administration and Economic Analysis Division

With the increasing economic developments in Wyoming, there is a significant shortage of adequate housing. The Legislature of the State of Wyoming has enacted The Wyoming Workforce Housing Infrastructure Program, sponsored by the Joint Mineral, Business, and Economic Development Interim Committee. As the bill is stated, this is an act relating to economic development; establishing a program to provide funding for cities, towns,

counties, special improvement districts, and joint powers boards for workforce housing infrastructure and community land trusts; establishing an account; providing for administration of the program and account; providing rulemaking authority; requiring reports; providing for a continuous appropriation and making other appropriations; and providing for effective dates. In addition, the purpose of the act is to promote and continue economic development by providing adequate housing necessary to create additional economic health and a stronger state economy.

According to the *Carbon County Community Needs Assessment*, published in December 2002, of the 32 respondents, 34 percent of them reported their level of satisfaction as good, 53 percent rated their level of satisfaction as fair, and 13 percent measured their level of service as poor. The unavailability of Section 8 housing in Medicine Bow, lack of housing for disabled persons, and lack of assisted living housing for elderly residents were reasons provided by the respondents who rated housing poor. Some respondents in the communities of Saratoga, Encampment, and Riverside expressed the lack of low-income housing and frustration with the complexity of the U.S. Department of Housing and Urban Development (HUD) Section 8 application, whereas respondents in the Little Snake River area did not have these issues. The City of Baggs affordable housing opportunities fluctuate depending on the temporary employment changes. The City of Medicine Bow has a growing number of purchases of vacant homes from retirees outside of their community. As a result, the limited unoccupied homes available contain unsuitable living conditions. Additional low-income housing is needed in the City of Hanna as the Hanna Housing Authority reported that all housing units are occupied. Overall, Carbon County and the other municipalities need to collaborate and administer an assessment of low-income housing requirements.

3.4.1.2 Educational Facilities

To determine the current carrying capacity of the educational facilities in Carbon County, current and historical enrollment were examined in conjunction with pupil-teacher ratios (Table 3-9). Since the early 1990s, the number of students enrolled in Carbon County District #1 schools has steadily decreased to 2005. Enrollment in the early 1990s was over 2,000 students, approximately 14 percent of the population, whereas enrollment since 1998 has dropped below 2,000 students with approximately 11 percent of the population enrolled in school. Carbon County District #2 has fluctuated in enrollment the past several years and has gradually decreased since the 1990s. Overall for District #2, the enrollment has decreased from over 1,000 students, approximately 7 percent of population, to below 700 students, 4 percent of the total population.

School quality, based on a comparison of pupil-teacher ratios to state and national standards, has improved concurrently with the decrease and fluctuation in enrollment for Districts #1 and #2. The pupil-student ratio in Carbon County has been significantly lower than the national standard since 1996, the earliest year for which data were obtained. In 2003, the latest year for which information is available, the pupil-teacher ratio in the county for District #1 was 12.8 and 8.7 for District #2, compared to a ratio of 15.9 for the nation as a whole.

TABLE 3-9
Carbon County Enrollment and Pupil-Teacher Ratios

	District #1		District #2		Pupil-Teacher Ratios				
Year	October 1 Enrollment	Percent of Population Enrolled	October 1 Enrollment	Percent of Population Enrolled	Carbon County District #1	Carbon County District #2	Study Area Average	Wyoming	United States
2006	1,753	11	662	4	N/A	N/A	N/A	N/A	N/A
2005	1,727	11	662	4	12.5	8.2	10.3	N/A	N/A
2004	1,664	11	700	5	12.3	8.9	10.7	N/A	N/A
2003	1,728	11	699	5	12.8	8.7	10.7	13	15.9
2002	1,778	12	743	5	14.2	9.0	11.6	12.5	15.9
2001	1,923	13	724	5	13.8	9.0	11.4	13.3	16
2000	1,946	12	791	5	13.8	9.3	11.6	13.3	16.1
1999	1,965	12	887	6	14.2	10.2	12.2	14.2	16.4
1998	1,992	13	898	6	14.4	10.2	12.3	14.5	16.8
1997	2,076	13	1,010	6	14.6	10.7	12.7	14.7	17.1
1996	2,216	14	1,033	6	15.7	10.5	13.1	N/A	N/A
1995	2,240	14	1,057	7	16.4	10.9	13.7	N/A	N/A
1994	2,224	14	1,130	7	N/A	N/A	N/A	N/A	N/A
1993	2,346	14	1,107	7	N/A	N/A	N/A	N/A	N/A
1992	2,379	15	1,123	7	N/A	N/A	N/A	N/A	N/A
1991	2,420	15	1,209	7	N/A	N/A	N/A	N/A	N/A

Source: Wyoming Department of Education (see Baseline for Cite).
Wyoming Data Handbook (Equality State Almanac) 1981, 1985, and 1991 (see Baseline for Cite).
National Center for Education Statistics. Digest of Education Statistics, 2003.

To determine the carrying capacity of a school district, an assessment was completed on the number of students that could be added to a district before the teacher-pupil ratio exceeds a certain standard. Table 3-10 shows that enrollment in Carbon County school district could increase by 465 students for District #1 and 620 students for District #1 before the national teacher-pupil ratio is exceeded.

TABLE 3-10
Enrollment Increase Required for Carbon County Districts Before U.S. Teacher-Pupil Standard is Exceeded

District Number	Total FTE 2005	Enrollment 2005	Student-Teacher Ratio in 2005	No. of Students that Could be Added Before National Student-Teacher Ratio is Exceeded
District # 1	137.91	1,727	12.52	465
District # 2	80.65	662	8.21	620

Note: National Student-Teacher Ratio assumed to be 15.9 based on average ratio since 2000.

To assess which future needs are anticipated for the baseline population growth in the area, local school district CIPs were reviewed for planned expansions. Table 3-11 shows the planned improvements for Carbon County School Districts. This does not include minor

updates such as painting and repaving parking. In general, the following improvements should not significantly change the carrying capacity of the county schools.

TABLE 3-11
Major Capital Improvement Projects for Carbon County School Districts

District Name	School Name	Building Name	Project Description
Carbon County School District No. 1	Rawlins Consolidated ES-Rawlins Consolidated ES (3-5) Proposed		Construction on new consolidated elementary school
Carbon County School District No. 1	Rawlins Consolidated ES-Rawlins Consolidated ES (K-2) Proposed		Construction of new elementary school
Carbon County School District No. 2	Saratoga MS (6-8)	Saratoga MS	Demolition

Source: State of Wyoming School Facilities Commission, Major and Minor Capital Improvement Projects, 2005. http://sfc.state.wy.us/DMPInfo.aspx

Through the evaluation of historic and current enrollment, student-teacher ratios, and CIPs, it is clear that the carrying capacity of the educational facilities in Carbon County is not currently being exceeded or expected to be exceeded in the future with natural population growth.

3.4.1.3 Public Safety (Law Enforcement and Fire Services)

Carbon County has approximately 41 law enforcement officials and 130 fire fighters. To determine the carrying capacity of public safety within Carbon County, the ratio of citizens to law enforcement officials and fire fighters in the county was compared with state and national standards. Table 3-12 displays this information for 2000, 2005, and 2010.

TABLE 3-12
Level of Public Safety in Carbon County

Law Enforcement Statistics			
		Citizen to Police Ratio	
Carbon County		**Wyoming**	**U.S.**
Carbon County Population 2000	15,639		
Carbon County Population 2005	15,331		
Carbon County Projected Population 2010	15,730		
Number of Law Enforcement	41		
Citizen to Police Ratio per 1,000 Citizens (2000)	2.6		
Citizen to Police Ratio per 1,000 Citizens (2005)	2.7	2.5	2.5
Citizen to Police Ratio per 1,000 Citizens (2010)	2.6		
Fire Statistics			
Carbon County		**Wyoming**	**U.S.**

TABLE 3-12
Level of Public Safety in Carbon County

Carbon County Population 2000	15,639		
Carbon County Population 2005	15,331		
Carbon County Projected Population 2010	15,730		
Number of Fire Fighters	130		
Citizen to Fire Fighter Ratio per 1,000 Citizens (2000)	8.3		
Citizen to Fire Fighter Ratio per 1,000 Citizens (2005)	8.5	1.8	1.8
Citizen to Fire Fighter Ratio per 1,000 Citizens (2010)	8.3		

Source: National Fire Protection Administration; National Justice Center Statistics. Population projections from: http://eadiv.state.wy.us/pop/wyc&sc20.htm

As shown in the table, for 2000 and 2005, there are 2.6 and 2.7, respectively, law enforcement officers per 1,000 citizens in Carbon County. This was slightly higher than the ratios for the State of Wyoming and the United States, which are both 2.5 officers per 1,000 citizens. In 2010, the ratio is expected to be 2.6 law enforcement officers per 1,000 citizens if there is no change in officer employment.

The ratio of fire fighters to 1,000 citizens is excellent in Carbon County as compared to the 1.8 ratio standard established by the National Fire Protection Administration. In Carbon County, the ratio of fire fighters to 1,000 citizens for 2,000 and 2005 was 8.3 and 8.5, respectively. In 2010, the ratio is expected to be the same at 8.3 fire fighters to 1,000 citizens. However, over 100 fire fighters would need to leave and not be replaced in order to bring the ratio close to the national standard. This seems to be a highly unlikely occurrence. Therefore, it is inferred that the population in the county can increase greatly before the carrying capacity of public safety is exceeded.

3.4.1.4 Health

Carbon County offers a variety of health service centers including a hospital, medical services, nursing homes, and dental office. Carbon County Memorial Hospital is the largest health care services provider in the county and, as such, will be used to determine the carrying capacity of health care services within the county. The general hospital statistics are provided in Table 3-13 below.

TABLE 3-13
Carbon County Memorial Hospital Statistics

Carbon County Memorial Hospital	Carbon County
General Statistics (2001)	
Number of Acute Care Beds	45
Average Bed Occupancy	9 to 14 per day
Number of Acute Admissions per Year	1,570
Number of Outpatient Visits	29,400
Number of Inpatients	1,760

TABLE 3-13
Carbon County Memorial Hospital Statistics

Carbon County Memorial Hospital	Carbon County
Number of Surgeries	700
Number of Emergency Room Visits per Year	8,200
Number of Swing Beds	35
Staffing Levels (2004)	
Total Number of Physicians	15
Number of Full-Time Physicians	14
Number of Part-Time Physicians	1
Total Number of Medical Staff	106
Number of Full-Time Medical Staff	104
Number of Part-Time Medical Staff	2
Number of Medical Staff Vacancies	3

Source: Wyoming Professional Medical Survey, October 2004.
Baseline document from Tetra Tech for 2001.

http://www.imhcc.com/

General statistics were from Carbon County personal communication July 2007

The hospital has 45 acute care beds with an additional 35 swing beds. In 2001, there were 1,570 acute admissions per year with almost 29,500 outpatient visits and 8,200 emergency room visits. Services include emergency room (ER), intensive care unit (ICU), medical, surgical, pediatrics, obstetrics (OB), ambulatory surgery, and long-term care. There were a total of 15 physicians working at the hospital in 2004. They represent a number of specialties including emergency medicine, family practice with OB, general surgery, pediatrics, and otorhinolaryngology (ears, nose, throat, head, and neck disorders) according to the Wyoming Office of Rural Health, 2004. In addition to the physicians, 106 general medical staff work at the hospital as well.

To determine the current carrying capacity of Carbon County Memorial Hospital, the physician-patient ratio at the hospital was compared to the recommended physician-patient ratio adopted by the Bureau of Health Professionals and the Graduate Medical Education National Advisory Committee. The Bureau recommends a physician-patient ratio of 230.9 physicians per 100,000 population; the National Advisory Committee recommends 194.6 physicians per 100,000 population. In addition to these metrics, carrying capacity can also be determined by comparing the number of beds per 100,000 population in the county to the ratio at state and national levels. These metrics are shown in Table 3-14 below.

TABLE 3-14
Physician-Patient Ratio and Bed-Patient Ratios for Carbon County Memorial Hospital, Wyoming, and the United States, 2000

	Carbon County	Wyoming	U.S.	Bureau-Recommended Physician-Patient Ratio	Advisory Committee-Recommended Physician-Patient Ratio
Total Number of Physicians	15	764	558,054		
Population	15,639	526,180	282,224,000		
Number of Physicians per 100,000 Population	93.8	145.2	197.7	230.9 physicians/ 100,000 Population	194.6 physicians/ 100,000 Population
Number of Beds per 100,000 Population	281.3	364.7	291.8		

Source: US. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professionals, *HRSA State Health Workforce Profiles: Wyoming*.

As shown in the table, the carrying capacity of Carbon County Memorial Hospital is currently being exceeded. The physician-patient ratio at the hospital was 93.8 in 2000, which was less than the ratios in both Wyoming and the United States. However, none of these ratios meets the Bureau's recommended physician-patient ratio of 230.9 physicians per 100,000 population, although the ratio for the United States does meet the Advisory Committee ratio recommendation of 194.6. The number of beds per 100,000 population in Carbon County was 281.3, which was less than the state ratio of 364.7 and U.S. average of 291.8.

3.4.1.5 Municipal Services

Electric power, natural gas, telephone, and cable services are readily available in Carbon County. These services are expected to meet the needs of its citizens given the expected population growth of Carbon County.

Water and wastewater services require a more detailed evaluation of their carrying capacity. There are a total of 29 water and wastewater facilities in Carbon County serving over 17,094 people. In terms of municipal water supply, carrying capacity is determined by comparing the total maximum capacity, average day use, and peak day use. Table 3-15 provides the general statistics of municipal water supply systems in Carbon County.

TABLE 3-15
Carbon County Municipal Water Systems

Water System Name	Population Served	Total Maximum Capacity (gpm)	Average Day Use (gpm)	Peak Day Use (gpm)	Percentage Available Before Exceeding Peak Day Use
Baggs	400	200	66	104	48.0%
Dixon	75	220	15	19	91.4%
Elk Mountain	207	250	23	42	83.2%
Encampment	443	300	98	231	23.0%
Hanna	876	1,000,000	345	556	99.9%
Medicine Bow	282	620	64	90	85.5%
Rawlins	NA	7,017	1,297	2,866	59.2%
Saratoga	1,850	1,250	347	833	33.4%
Sierra Madre	195	263	20	69	73.8%
Sinclair	500	1,388	1,389	1,389	0.0%

Source: Wyoming Water Development Commission, State of Wyoming 2004 Water System Survey Report

Of the 10 municipalities, Dixon, Elk Mountain, Hanna, and Medicine Bow have over 75percent available capacity at peak day before the system reaches total maximum capacity. In addition, Rawlins and Sierra Madre have between 50 and 75 percent available capacity. The communities of Baggs, Encampment, and Saratoga have between 23 and 48 percent capacity available. The water system for Sinclair has already reached the maximum capacity at peak day use. Overall, the municipalities average over 50 percent available peak day use before reaching maximum capacity.

The carrying capacity of wastewater treatment facilities in the study area was not available.

3.4.1.6 Roads and Highways

The project is located approximately 13 miles south of Medicine Bow. The site will be accessed from the north via the US 30/287 (Minor Arterial Road classification) and County Road 1/3 intersection in Medicine Bow. There are five highways and one county road that may be affected by the project. Personnel and truck traffic from the west will use WYO 72 (Major Collector Road classification) to access US 30/287. Truck traffic from the east will use WYO 13 (Major Collector Road classification) to access US 30/287. Personnel from the east will access US 30/287 in Laramie. Personnel from Casper will use WYO 220 (Other Principal Arterial classification) and WYO 487 (Minor Arterial Road classification) to access US 30/287. The site will not be accessed from the south on County Road 1/3. Although Interstate 80 will be used during project construction, it is not expected to be affected permanently by the project. Interstate 80 through Wyoming is a major freight route for trucks traveling between Chicago and San Francisco. Half of its volume is semi-trucks, so the road is maintained to accommodate heavy vehicular loads.

The operating conditions or LOS provided by the highways and the US 30/287 intersection with County Road 1/3 were assessed using the *Highway Capacity Manual* two-lane highway and unsignalized intersection methodologies. LOS is a term used to describe operating conditions qualitatively in a traffic stream and motorists' perceptions of those conditions. Six LOS classifications are given a letter designation from A to F with A representing the best operating conditions and F the worst. LOS D is typically considered desirable for peak-hour operations.

For two-lane highways, LOS is defined in terms of average travel speed and percent time spent following another vehicle. US 30/287 is multi-lane for part of the segment between Laramie and Medicine Bow; however, the two-lane section closer to Medicine Bow represents the worst-case scenario for evaluating traffic operations. For unsignalized intersections, LOS is defined in terms of average delay per vehicle for the stop-controlled movements. The method incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street, stop-controlled intersections, a delay is typically represented in seconds for each movement from the minor approaches and the left turns from the major street.

Existing Peak-Hour Levels of Service

Volumes and roadway/intersection geometries are inputs to the analysis methodologies. WYDOT provided 2006 and 2016 average daily traffic volumes and truck percentages for the highways. An annual growth factor was calculated from these two volumes and applied to the 2006 volumes to determine the 2007 volumes. The directional distribution is assumed to be a 60/40 split per the *Highway Capacity Manual* default value. WYDOT also had some volume counts on County Road 1/3 for various years between 1986 and 2002. These counts show a decreasing trend. A 2007 daily volume was estimated for this road by reducing the last known count by 10 vehicles in accordance with the decreasing trend. To be conservative, it is assumed that the volume will not continue to decrease beyond 2007. The peak hour is estimated to be 10 percent of the daily volume for all roadways.

No turning movement counts are available for the US 30/287 and County Road 1/3 intersection. An assumption was made that the traffic on County Road 1/3 is equally distributed to/from the north, west, and east. This assumption determined the peak-hour turning movement counts between the two roadways and the through movement on County Road 1/3 across US 30/287. The through movement volume on US 30/287 was determined by subtracting the left and right turns on each approach from the given highway volume. Table 3-16 shows the existing highway and intersection volumes and corresponding LOS. The intersection LOS is shown for both morning and evening peak hours.

TABLE 3-16
Existing Peak Hour Operating Conditions (Year 2007)

Facility	Average Daily Volume	Peak-Hour Volume	Percent Trucks	Peak-Hour LOS
Highways				
US 30/287	880	88	15	A
WYO 13	265	27	12	A
WYO 72	755	76	5	A
WYO 220	3625	362	22	C
WYO 487	640	64	10	A
Intersection				
Westbound Left	N/A	3	1	A/A
Eastbound Left	N/A	3	1	A/A
Northbound	N/A	9	1	A/A
Southbound	N/A	9	1	A/A

Source: CH2M HILL, 2007.

All of the facilities operate at very desirable levels of service during the peak hours. On the highways, the average travel speed is relatively high, and the percent time spent following another vehicle is correspondingly low. At the intersection, the turning movements experience an average delay of less than 10 seconds per vehicle.

Table 3-17 below is the Planned Improvements to Transportation Infrastructure that have been identified in the project area.

TABLE 3-17
Planned Improvements to Transportation Infrastructure by WYDOT

Site	Facility	County	Description	Length of Construction
Medicine Bow-Bosler Junction	US 30 / 287	Carbon and Albany	Widen and overlay	11.52 miles
Hanna-Elk Mountain	WYO 72	Carbon	Widen and overlay	10.74 miles

Source: WYDOT FY 2007 State Transportation Improvement Program Report. Accessed July 20, 2007. http://www.dot.state.wy.us WYDOT Home>Agency Operations>Planning Program>Programming.

3.4.2 Carrying Capacity of the Area of Impact With Project

To determine the impact of the project on the area of impact infrastructure, the impact of the imported workforce and natural population growth as described above were analyzed. The following describes those results.

3.4.2.1 Housing

The construction of the proposed project will require 2,300 EPC workers for both the plant and mine during peak construction. Based on Medicine Bow calculations, it is assumed that 10 percent will be local workers and 90 percent will be imported workers coming to Carbon County. At peak construction, this results in 2,070 imported workers coming to the county that will need housing. At peak construction in 2010, the total housing gap, according to Table 3-5, is a surplus of 1,978 total units. Of these units, 723 are renter units and 1,255 are homeowner units. With the construction jobs being temporary, it is assumed that the majority of the workers relocating to the area will rent.

Assuming a worse case scenario in which all 2,070 workers relocating at peak construction will rent and a projected surplus in Carbon County of only 723 units, there is a shortfall of 1,347 rental units in Carbon County. It is assumed that additional adequate housing will be provided through the housing mitigation strategies outlined in Section 5.

The average estimated income for construction workers was determined from the estimated hourly wage per trade displayed in Table 3-1. Assuming that the employees work 2,080 hours a year, not including overtime or bonuses, the average annual income was determined for each construction trade category. From this, it was estimated that the median annual income is $46,696 for all construction workers (Table 3-18). This is higher then the median household income for homeowners and renters in Carbon County of $41,600 and $21,931, respectively. The detail of each trade is displayed below.

TABLE 3-18
Estimated Median Household Income

Homeowner Median Household Income	$41,600
Renter Median Household Income	$21,931
Civil Works	$39,582
Structural Steel	$40,643
Insulation/Paint	$41,642
Equipment	$46,696
Piping	$47,757
Electrical	$48,048
Instrumentation	$51,189
Median Annual Income	$46,696

Source: CH2M HILL Calculations

As stated above, the average workers estimated median annual base income is $46,696. As shown below, this income range is the second highest percent for owner and renter-occupied households per income in Carbon County. The income range of $45,000 to $49,999 is above 61 percent of the total owner-occupied households and above 84 percent of renter occupied households. Although limited in supply, it is anticipated that the available rental units will be affordable to the construction workforce.

TABLE 3-19
Households by Income Range

Income Range	Owner-Occupied		Renter-Occupied	
	Households	Percent	Households	Percent
Less than $5,000	105	2.42	139	7.78
$5,000 to $9,999	229	5.27	243	13.61
$10,000 to $14,999	328	7.55	153	8.57
$15,000 to $19,999	278	6.4	201	11.25
$20,000 to $24,999	294	6.77	159	8.9
$25,000 to $34,999	581	13.38	326	18.25
$35,000 to $49,999	836	19.25	271	15.17
$50,000 to $74,999	1,014	23.35	208	11.65
$75,000 to $99,999	381	8.77	49	2.74
$100,000 to $149,999	183	4.21	22	1.23
$150,000 or more	114	2.62	15	0.84
Total	**4,343**	**100**	**1,786**	**100**

Source: Wyoming Housing Database Partnership

3.4.2.2 Educational Facilities

To evaluate the potential impact of the project on the Carbon County School Districts, the number of school-aged children was determined. It is projected that at the time of peak construction, 2,300 workers will be needed for the project. Of those workers, 230 are projected to be local and the remaining 2,070 will come from outside of the county and Secondary Area of Impact.

Because any children from local workers are already in the Carbon County school system, the potential impact will come from those workers who relocate to Carbon County with their families. Based on prior large construction projects, it is assumed that 53 percent (1,098) of all non-local workers would relocate to the area of impact without other household members, thereby assuming a single status for the duration of their stay in the area of impact. Using these numbers, it is expected that 47 percent (972) of imported workers will bring their families and their estimated household size would be similar to that in the four-county study area, namely 2.4 per household.

Using these assumptions, it is estimated that an additional 389 school-aged children will be enrolled in the Carbon County School Districts at the peak of construction. Because this is significantly lower than the 1,093 students needed to exceed the national student-teacher ratio, the carrying capacity of the school district will not be impacted by the project. Table 3-20 below provides a detailed breakdown of the calculations described above.

TABLE 3-20
Potential Impact of School-Aged Children on Carbon County School Districts

Number of Workers Needed at Peak Construction	2,300
Number of Potential Local Workers at Peak Construction	230
Number of Potential Imported Workers at Peak Construction	2,070
Estimated Number of Imported Workers Bringing Households to Carbon County	972
Average Household Size	2.4
Total Number of Family Individuals in Households in Carbon County	2,333
Number of Adults in Family Households in Carbon County	1,944
Number of School-Aged Children at Peak of Construction Added to Carbon County	389
Number of School-Aged Children That Could be Added Before National Student-Teacher Ratio is Exceeded	1,093

Source: CH2M HILL calculations.

3.4.2.3 Public Safety (Law Enforcement, Fire Services, Emergency Medical Treatment)

To determine whether the carrying capacity of public safety within Carbon County would be impacted by the project, the ratio of citizens to law enforcement officials and fire fighters in the county was compared with state and national standards both with and without the project. Table 3-21 displays this information for 2010, the peak construction period.

TABLE 3-21
Potential Impact of Project on Carbon County and Town of Medicine Bow Public Safety

		Citizen to Police Ratio	
		Wyoming	**U.S.**
Without Project Law Enforcement			
Carbon County Projected Population 2010	15,730		
Number of Law Enforcement	41		
Police-to-Citizen Ratio Per 1,000 Citizens (2010)	2.6	2.5	2.5
With Project Law Enforcement			
Number of Imported EPC Workers and Associated Household Members	3,431		
Estimated Carbon County Population With Imported EPC Workers (2010)	19,161		
Police-to-Citizen Ratio Per 1,000 Citizens With Project (2010)	2.2	2.5	2.5
Fire Statistics		**Wyoming**	**U.S.**
Without Project Fire Fighters			
Carbon County Projected Population 2010	15,730		
Number of Fire Fighters	130		
Fire Fighter-to-Citizen Ratio Per 1,000 Citizens (2010)	8.1	1.8	1.8
With Project Fire Fighters			
Number of Imported EPC Workers and Associated Household Members	3,431		
Estimated Carbon County Population With Imported EPC Workers (2010)	19,161		
Fire Fighter-to-Citizen Ratio Per 1,000 Citizens With Project (2010)	6.8	1.8	1.8

Source: National Fire Protection Administration. National Justice Center Statistics.

As shown by the table, neither the ratio of law enforcement officers nor fire fighters per 1,000 citizens falls below the national ratio for these statistics when the projected population increase is included in the calculations. The ratio of law enforcement officers to 1,000 citizens with the additional population associated with the project is 2.2, compared to the national standard of 2.5. In terms of the ratio of fire fighters to 1,000 citizens, the ratio with the additional population falls from 8.1 fire fighters per 1,000 citizens to 6.8 fire fighters per 1,000 citizens. Again, this is substantially better than the national standard established by the National Fire Protection Administration. Therefore, despite a slight decline in the ratios of public safety officers to citizens, the resulting ratios are still significantly higher than the state and national ratios, indicating that the population increase due to the project will have negligible impact on the level of public safety in the county.

3.4.2.4 Health

The carrying capacity of health service levels are currently being exceeded as was detailed in Section 3.4.1.1. Table 3-22 shows the potential impact of the project on health services within the county, particularly as they relate to Carbon County Memorial Hospital. It should be noted that data for the total number of physicians and the total number of beds for the county are from 2007, while the corresponding data for Wyoming and the United States are from 2000, the latest years for which data could be obtained. Projected numbers for health care are not available.

TABLE 3-22
Potential Impact of Project on Carbon County Health Services, 2010

	Carbon County Without Project	Carbon County With Project	Wyoming (2000)	U.S. (2000)	Bureau Recommended Physician-Patient Ratio	Advisory Committee Recommended Physician-Patient Ratio
Total Number of Physicians (2000)	15	15	764	558,054		
Total Number of Beds (2000)	45	45	1,919	823,530		
Population (2010)	15,730	19,161	526,180	282,224,000	230.9 physicians/ 100,000 population or 1 physician for every 433 persons	194.6 physicians/ 100,000 population or 1 physician for every 514 persons
Number of Physicians per Population (2010)	1 physician for every 1,049 persons	1 physician for every 1,277 persons	1 physician for every 689 persons	1 physician for every 506 persons		
Number of Beds per Population (2010)	1 bed for every 349 persons	1 bed for every 426 persons	1 bed for every 274 persons	1 bed for every 292 persons		

Source: US. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professionals, *HRSA State Health Workforce Profiles: Wyoming.*

The national standard for physicians to population is one physician to every 433 persons (according to the Bureau recommendations) or one physician to every 514 persons (according to the Advisory Committee recommendations). For the Carbon County area, the number of physicians goes from one for every 1,049 persons without the project to one for every 1,277 persons with the project. Both numbers are well below the national standard for

physician-to-patient ratios. However, the Wyoming and U.S. averages are also well below the national standard, with one physician to every 689 and 506 persons, respectively.

Similarly, the number of beds per person is reduced from one bed for every 349 persons without the project to one bed for every 339 persons with the projects. These ratios may be somewhat higher in reality because they are calculated using the projected 2010 population but only 2000 data for total physicians and beds. It is expected that the number of physicians and beds would increase to some extent in this period. Regardless of the calculation, it is clear that the exceedance of the carrying capacity is not a result of the project but rather due to current staffing levels.

3.2.4.5 Municipal Services

The municipalities within Carbon County average over 50 percent available peak day use before reaching maximum capacity. It is anticipated that the additional population of workers and their families to the area will not impact current municipal water supply.

The carrying capacity of the wastewater treatment facilities was not available in the study area. It is anticipated that the wastewater treatment facilities projections would result in a similar fashion as the municipal water supply and will have not impact.

3.2.4.6 Roads and Highways

During project construction, roads and highways may be impacted by vehicles hauling materials to and from the site. Contractors will comply with existing federal, state, and county requirements and restrictions to protect the road network and the traveling public. In addition, load limits will be observed at all times to prevent damage to existing paved road surfaces. If necessary, arrangements to transport oversized loads will be coordinated with and approved by the WYDOT.

It is expected that there will be approximately 2,300 personnel working at the site during the peak construction period. Of this total, 500 will be housed onsite with the remaining 1,800 traveling to the site via US 30/287 and County Road 1/3. These personnel are expected to live in various locations and use the following access routes:

- Hanna - US 30/287 (500 personnel)
- Elk Mountain - WYO 72 to US 30/287 (250 personnel)
- Laramie – US 30/287 (500 personnel)
- Casper - WYO 220 to WYO 487 to US 30/287 (50 personnel)
- Medicine Bow – WYO 487 and County Road 1/3 (500 personnel)

The project team will supply chartered busing from Hanna, Elk Mountain, and Laramie to reduce the number of vehicles traveling to Medicine Bow. The personnel that travel via car will be required to park in a designated lot in Medicine Bow and ride a bus along County Road 1/3 to complete their commute to the project site. This lot is anticipated to be on the north side of US 30/287. It is assumed that the personnel living in Medicine Bow will use local roads rather than US 30/287 to access this parking lot.

It is expected that the needed construction materials will be hauled to the site by rail and truck. The closest rail siding is parallel to US 30/287 on the south side in the vicinity of Medicine Bow. Materials shipped by rail will be off-loaded onto trucks to complete the

journey to the project site. It is expected that 5,000 deliveries will be required during the peak period in the last 11 months of construction.

After construction is complete, the mine and plant operations will require 370 personnel. Like the construction period, the site will be accessed from the north via the US 30/287 and County Road 1/3 intersection. It is assumed that all operations personnel will drive their own vehicles to the project site. These personnel are expected to live in various locations and use the following access routes:

- Hanna - US 30/287 (124 personnel)
- Elk Mountain - WYO 72 to US 30/287 (123 personnel)
- Medicine Bow – Various local roads to County Road 1/3 (123 personnel)

Operations Analysis of Potentially Affected Roads and Highways

In order to assess the potential traffic impacts associated with the proposed project, existing and future traffic conditions were analyzed both with and without the project for three time periods: existing, construction, and operations. The Institute of Transportation Engineers' *Trip Generation Manual*, the Federal Highway Administration's *Highway Capacity Manual*, and the WYDOT planning department were used as resources for this analysis.

Construction Period Peak-Hour Levels of Service

The highways and intersections were analyzed with and without the project to determine impacts to the facilities due to the construction project. The construction will take place over three years between 2008 and 2011. The peak will occur in 2010, so it is used as the analysis year to represent the worst case scenario.

Background Analysis - The highway volumes were grown by the same annual growth rate to obtain 2010 background volumes. Due to the nature of the properties it accesses, the county road volume is assumed to remain the same as the 2007 volume. Hence, the turn movement volumes at the intersection remain the same while the through movements on US 30/287 show a minimal growth for the background scenario. It is assumed that the truck percentage does not grow. Table 3-23 shows the 2010 background highway and intersection volumes and corresponding LOS. The intersection LOS is shown for both morning and evening peak hours.

TABLE 3-23
Construction Period Background Operating Conditions (Year 2010)

Facility	Average Daily Volume	Peak Hour Volume	Percent Trucks	Peak Hour LOS
Highways				
US 30/287	910	91	15	A
WYO 13	285	29	12	A
WYO 72	810	81	5	A
WYO 220	3645	365	22	C
WYO 487	680	68	10	A
Intersection				
Westbound Left	N/A	3	1	A/A
Eastbound Left	N/A	4	1	A/A
Northbound LTR	N/A	9	1	A/A
Southbound LTR	N/A	10	1	A/A

Source: CH2M HILL, 2007.

All of the facilities operate at very desirable levels of service during the peak hours. On the highways, the average travel speed is relatively high and the percent time spent following another vehicle correspondingly low. At the intersection, the turning movements experience an average delay of less than 10 seconds per vehicle.

Total Analysis – Adding the site-generated traffic to the background traffic yields the volumes for the analysis of the construction period with the project. The trip generation and distribution process used the following assumptions to calculate the additional highway and turn movement volumes due to the construction project:

- Construction will occur in two daily shifts with the first shift utilizing 70 percent of the workforce.
- The workers all arrive in the morning peak hour and depart in the evening peak hour.
- In the towns where buses are available, half of the workers will ride the bus and the other half will ride in personnel vehicles.
- Each bus will transport 40 people.
- The average vehicle occupancy is 1.3 people per vehicle.
- The buses will travel directly to the project site from the US 30/287 and County Road 1/3 intersection.
- The personnel traveling in cars will turn north through the US 30/287 and County Road 1/3 intersection to access a designated parking lot and then transfer to a bus to complete the commute to the project site.
- The buses from the towns only make one trip per peak hour.
- The buses from the designated parking lot make round trips during each peak hour between the parking lot and the project site.
- The 5,000 truck deliveries over the peak 11-month period equates to two deliveries, or four trips, per hour. Eight truck trips are assumed in each peak hour to provide a factor of safety.
- Truck trips are distributed evenly to the east and west.

These assumptions result in the estimation of 246 additional cars, six buses, and two trucks traveling to Medicine Bow and through the intersection from the west and 146 cars, four buses, and two trucks from the east. Twenty-one buses travel across US 30/287 on County Road 1/3 to shuttle personnel between the designated parking lot and the project site.

Table 3-24 shows the 2010 total highway and intersection volumes and corresponding LOS. The distribution of personnel results in different volumes on US 30/287 on either side of Medicine Bow, so two LOSs are shown for this highway. Likewise, the WYO 487 analysis is split into two. It experiences a greater volume increase in town because of the personnel staying in Casper and in Medicine Bow as opposed to north of town in which the volume increase is only attributable to the personnel staying in Casper. The truck percentage

increases on all routes that experience bus and truck travel generated by the construction project. The intersection LOS is shown for both morning and evening peak hours.

TABLE 3-24
Construction Period Total Operating Conditions (Year 2010)

Facility	Average Daily Volume	Peak Hour Volume	Percent Trucks	Peak Hour LOS
Highways				
US 30/287	1785	321	20	C West of Medicine Bow
US 30/287	1480	146	20	B East of Medicine Bow
WYO 13	330	32	15	A
WYO 72	1160	160	10	B
WYO 220	3750	393	22	C
WYO 487	790	95	10	A North
WYO 487	1175	232	10	B In Medicine Bow
Intersection				
Westbound Left	N/A	250	1	A/A
Eastbound Left	N/A	9	1	A/A
Northbound LTR	N/A	34	90	D/B
Southbound LTR	N/A	423	90	C/B

Source: CH2M HILL, 2007.

All of the facilities operate at desirable levels of service during the peak hours. Most of the highways experience a decrease in LOS due to the additional volume generated by the construction project. This equates to a lower average travel speed and fewer passing opportunities that cause an increase in percent time spent following. The biggest increases in average delay at the intersection are experienced by the northbound and southbound left, through, and right movements. The available gaps through which to turn or travel across the intersection are reduced because of the significant increase in westbound left turns that are accessing the designated parking lot on the north side of US 30/287 in the morning. In the evening, 146 southbound vehicles turning left from the parking lot to eastbound US 30/287 cause some additional delay for the northbound approach.

Operations Period Peak-Hour Levels of Service

The highways and intersections were analyzed with and without the project to determine impacts to the facilities due to the operations of the project after construction is complete. The operations will begin in 2011, so the analysis year is 2011. WYO 220 and WYO 487 are not analyzed for this period because it is assumed that no operations personnel will live in Casper.

Background Analysis - The highway volumes were grown by the same annual growth rate to obtain 2011 background volumes. Due to the nature of the properties it accesses, the county road volume is assumed to remain the same as the 2007 volume. Hence, the turn movement volumes at the intersection remain the same while the through movements on

US 30/287 grow a little for the without project, or background, scenario. It is assumed the truck percentage does not grow. Table 3-25 shows the 2011 background highway and intersection volumes and corresponding LOS. The intersection LOS is shown for both morning and evening peak hours.

TABLE 3-25
Operations Period Background Operating Conditions (Year 2011)

Facility	Average Daily Volume	Peak Hour Volume	Percent Trucks	Peak Hour LOS
Highways				
US 30/287	920	92	15	A
WYO 13	300	30	12	A
WYO 72	825	83	5	A
Intersection				
Westbound Left	N/A	3	1	A/A
Eastbound Left	N/A	5	1	A/A
Northbound LTR	N/A	9	1	A/A
Southbound LTR	N/A	11	1	A/A

Source: CH2M HILL, 2007.

All of the facilities operate at very desirable levels of service during the peak hours. On the highways, the average travel speed is relatively high, and the percent time spent following another vehicle is correspondingly low. At the intersection, the turning movements experience an average delay of less than 10 seconds per vehicle.

Total Analysis – Adding the site generated traffic to the background traffic yields the volumes for the analysis of the operations period with the project. The trip generation and distribution process used the following assumptions to calculate the additional highway and turn movement volumes due to the operation of the project:

- Mine workforce will operate in three 8-hour shifts. First shift will arrive and third shift depart in morning peak hour. Second shift will arrive and first shift depart in evening peak hour.
- Plant workforce will operate in two 12-hour shifts. First shift will arrive and second shift depart in morning peak hour. First shift will depart and second shift arrive in evening peak hour.
- All personnel will travel in their own vehicles to the project site.
- Two truck deliveries, or four truck trips, per peak hour.
- Truck trips are distributed evenly to the east and west.

These assumptions result in the estimation of 256 additional cars and two trucks traveling to Medicine Bow and through the intersection from the west and two trucks from the east. An additional 26 cars travel on County Road 1/3 north of US 30/287.

Table 3-26 shows the 2011 total highway and intersection volumes and corresponding LOS. The distribution of personnel results in different volumes on US 30/287 on either side of Medicine Bow, so two LOSs are shown for this highway. The truck percentage increases slightly on all routes that experience truck travel generated by the operation of the project. The intersection LOS is shown for both morning and evening peak hours.

TABLE 3-26
Operations Period Total Operating Conditions (Year 2011)

Facility	Average Daily Volume	Peak Hour Volume	Percent Trucks	Peak Hour LOS
Highways				
US 30/287	1450	321	16	C West of Medicine Bow
US 30/287	940	146	16	A East of Medicine Bow
WYO 13	310	320	13	A
WYO 72	1145	160	7	B
Intersection				
Westbound Left	N/A	4	1	A/A
Eastbound Left	N/A	5	1	A/A
Northbound LTR	N/A	165	1	B/B
Southbound LTR	N/A	37	1	B/B

Source: CH2M HILL, 2007.

All of the facilities operate at desirable levels of service during the peak hours. Two of the highway segments experience a decrease in LOS due to the additional volume generated by the operation of the project. This equates to a lower average travel speed and fewer passing opportunities that cause in increase in percent time spent following. The biggest increases in average delay at the intersection are experienced by the northbound and southbound left, through, and right movements. For the northbound left, the available gaps through which to turn are reduced because of the increase in the southbound through movement. The southbound left also has fewer gaps due to the increase in the northbound through movement across the intersection.

Summary of Operations Analysis of Potentially Affected Roads and Highways

Although the highways and intersections that will experience additional traffic due to the construction and operations of the proposed project will operate at a lower level of service than without the project, they will still operate at desirable levels of service in the peak hours. The most significant degradation to the operating conditions of the facilities occurs during the 11-month peak construction period. If the US 30/287 and County Road 1/3 intersection operations do prove to be unacceptable during the construction period, the project team is prepared to hire off-duty police personnel to control traffic through the intersection in the morning and evening peak hours.

Proposed Roadway Improvements

The project team is working with Carbon County to design upgrades to County Road 1/3 that will improve the facility to meet county standards for their Industrial Strength roadway classification and address drainage issues. In addition, acceleration and deceleration lanes on US 30/287 to accommodate turning traffic generated by the project are recommended to maintain the through movement operations on the highway. According to WYDOT and the American Association of State Highway and Transportation Officials (AASHTO) guidance, acceleration lanes for the northbound and southbound right turns should be 280 feet to reach a merging speed of 30 miles per hour (the posted highway speed through town). The right-turn deceleration lanes should also be 280 feet long to decelerate from 30 miles per hour to negotiate a 90-degree right turn. Left-turn deceleration lanes already exist for the left-turn lanes on US 30/287. Based on this analysis, no improvements are required to add capacity to the highways to accommodate the construction or operations-generated traffic.

3.5 Cumulative Impacts

In reviewing the potential projects in the study area, it was determined that the development of several wind energy projects could have the potential for cumulative impacts. These include Seven Mile Hill, High Plains Wind Energy, and Pine Draw Wind Farm Facility projects. These projects are described below:

- PacifiCorp proposes to develop the Seven Mile Hill wind farm located in Carbon County approximately 3 miles northwest of Medicine Bow. The facility, as presently designed, will include 66-1.5 megawatt General Electric wind turbines and associated plant assets. Construction is expected to commence in 2008 with operation to follow in 2009.
- GreenWing Pacific Energy Corp proposes to develop the High Plains Wind Energy project in Albany and Carbon Counties, approximately 5 miles southwest of the town of Rock River. The facility will consist of up to 125 wind turbine generators and associated plant assets. Construction of the wind farm is scheduled to begin in early 2008 and expected to occur over 10 to 12 months.
- Pine Draw Wind Farm is located 5 miles north and west of Medicine Bow in Carbon County. This wind farm is expected to include up to 125 wind turbines capable of generating up to 187.5 MW of electricity.

Based on potential housing needs for the above projects as well as for the Medicine Bow coal-to-liquids plant, the current housing mitigation plan as proposed will be adjusted accordingly to account for fluctuations in available housing units.

In addition, the cumulative effect of these projects represents a major benefit to skilled trade workers in the community as it provides the opportunity for much steadier employment in the region.

SECTION 4.0

Trade-Off Analysis

4.1 Project Impacts Compared to Project Benefits

The construction and operation would have the following benefits and impacts to the local community:

- The creation of up to 2,300 EPC new construction jobs over 3 years, about 10 percent of which would provide employment for local workers.
- The creation of approximately 450 permanent jobs for the local labor force.
- The additional employment of up to 638 temporary indirect jobs over 3 years resulting from construction. An additional 374 indirect jobs will result from operation of the plant and mine.
- Sales and use taxes of approximately $3,710,000 over the construction period.
- Ad valorem taxes and an increase in the assessed value of the county. It is estimated that the total ad valorem tax revenue generated during construction will be $9,830,000.
- Temporarily increase the population of Carbon County by 2,070 workers during peak construction. Of the total 2,070 workers, 972 are expected to bring their families. This peak is anticipated to last approximately 11 months.
- Increase the permanent population of Carbon County by 450 workers (some with families) for operations.
- Impact the availability of housing for the community and create the need for an additional 1,347 housing units to house the 2,070 construction workforce during peak construction.
- Incrementally add to an existing shortage of physicians in the community.

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SECTION 5.0

Recommendations

5.1 Mitigation Measures for Areas Where Impacts Exceed Benefits

Housing mitigation measures would be required due to the limited supply of available housing units. Housing is a concern of the local community even without these projects. Mitigation measures for housing are identified below.

5.1.1 Housing

It is recognized that adequate housing opportunities in Wyoming are decreasing due to the extensive energy development occurring in the state. In an effort to alleviate some of the shortages currently experienced, a preliminary housing study was performed to prevent an overload on any given community. Potential solutions were identified in the study to accommodate a potential housing shortage including building temporary housing, relying on long-term rentals in motels/hotels, using manufactured housing and fifth wheel sites, using construction worker camps, or building more permanent housing. Alternatives will continue to be refined during project development.

It is estimated that the rental market in Carbon County will be very tight during project construction and that the construction workforce will exceed available rental housing by approximately 1,347 units. The housing study evaluated housing options for up to 2,000 personnel.

The following general housing scenarios were identified in the study:

- The project site will have a housing facility with the capability of housing up to 500 personnel. The onsite housing facility will aid in the winter construction campaigns and also during start up and operations phases of the project.
- Adjacent communities within a reasonable commuting distance of the project site will be studied for the possibility of some type of both permanent and temporary housing. Possible locations include Saratoga, Medicine Bow, Hanna, Elk Mountain, Rock River, MacFadden, Arlington, Walcott, and Riverside/Encampment.
- The temporary housing facilities will be further evaluated with additional visits to the sites in the near future. It is anticipated that the temporary housing facilities will be tailored to the local area to utilize as much local assistance as possible, thereby maximizing benefits to the local community.

It is recommended that project team meet with local stakeholders and work to meet the housing needs of the temporary construction workforce in a manner that facilitates the long-term housing needs of adjacent communities and the county.

It is expected that all permanent operations employees would be able to find adequate housing in Carbon County.

SECTION 6.0

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