Navajo Mountain Chapter
Community Based Land Use Plan

NAHASDA Land Use Planning Project Number: JT-2000-1
The Navajo Mountain chapter covers about 389,000 acres and is home to about 1300 residents. It has about 630 registered voters as of 1997. Navajo Mountain has 1 Council Delegate that is shared with the Inscription House chapter. It is part of the Western Agency. It is located southeast of Navajo Mountain and south of Lake Powell and is accessed by traveling north on Navajo Route 16. Route 16 is the closest paved road, and starts 24.5 miles from the chapter house. An estimated 31 family farms are located within the chapter.

Navajo Mountain is the most isolated chapter within the Navajo Nation. It is also one of several sacred mountains of the Navajo religion. Its summit is the highest point on the Navajo Nation at 10,388 feet above sea level.

The chapter is situated in Coconino and Navajo Counties in northern Arizona and San Juan County in southern Utah. This unique situation has caused some conflict within the chapter because of a lack of balance of funding between the states and counties.

Primary employers are the Bureau of Indian Affairs (BIA) boarding school, employing 37, and the Navajo Nation. The Chapter's largest community is Rainbow Village. It has a population of approximately 260 and is located in the shadow of Navajo Mountain.

Precipitation ranges from 8 to 28 inches annually, with more than half of the precipitation falling during the winter. Temperatures average from 45 to 57 degrees and the winters are cold. The growing season lasts between 110 and 180 days. The area's weather is affected by its proximity to Navajo Mountain and Lake Powell.
Location
The area surveyed was within San Juan County, Utah and was made in part in the Navajo Indian Reservation. This area borders Arizona to the south and Colorado on the east. The San Juan River is the boundary to the north. The western boundary is Lake Powell on the Colorado River. Deep gorges exist along the San Juan River and the Colorado River.

Five settlements or communities exist within the area, the first being established in 1906. The area became an official part of the Navajo Reservation in March of 1933.

Climate
The Sierra Nevada Mountains and the Rockies greatly influence the climate of the area. The Rockies provide a barrier against cold blasts from the Great Plains and the Sierras block much of the moisture from the Pacific Ocean. This results in a cool desert-like environment. The precipitation rate and humidity level are low and daily temperatures can fluctuate greatly. Much of the precipitation arrives from the Gulf of Mexico. Average annual rainfall is less than 10” except in upper elevations; however, precipitation rates vary widely over the survey area. The wettest period of the year is in early fall. Flash flooding is often a problem during this time.

Winters are cold with a minimum low of 0 degrees Fahrenheit or lower 30% of the year. Snowfall is usually less than 12” a year. Temperatures can exceed 100 degrees during the summer months though with a very low humidity. The average length of the growing season is between 140 and 200 days.
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This section includes information on the planning process, the approach used, and the schedule of meetings and community participation. It also details the agreement with the CLUP committee.
The Planning Education Process employed by the consultant intended to assist the people of the chapter with a typical land use planning process, as well as to inform them about the decisions being made by the CLUP Committee and Chapter officials concerning land use. One of the primary ideas that were presented is that the process would not fulfill its purposes unless the public was involved. If the public does not support the ideas that are being pursued, the plan becomes obsolete and will never be completed.

The Native American Housing Assistance and Self-Determination Act (NAHASDA) has provided funds to the Office of Navajo Government Development in order to initiate land use planning and technical assistance for chapter governments within the Navajo Nation. The objective is to develop a land use plan based on the needs and concerns of the community, with an emphasis on designating land for housing and coordinating infrastructure development. This land use plan is to comply with the Navajo Nation Local Governance Act.

As stated by the Chapter officials, the fundamental goal of the Land Use Plan is to prepare for the growth of the future. Growth is a natural part of life and should not be resisted, but in order for growth to be as smooth and beneficial as possible, certain guidelines must be laid out beforehand.

Who is involved?

Office of Navajo Government Development (ONGD)
Funding for the project is provided through the Office of Navajo Government Development. All submissions and payment requests are sent to this office. The Executive Director acts as the project manager and primary contact for the Planning Team.

Atkins Benham Planning Team
The Planning Team was hired by the ONGD to develop the Land Use Plan and document the process. They make presentations to the local chapter and submit information to the ONGD and the local chapter.

Community Land Use Planning Committee (CLUP)
The CLUP is comprised of local residents who help review with the Planning Team. In some cases, CLUP members are also chapter officials or people with expertise in areas relating to planning. They also attend and help coordinate meetings with the public and the Planning Team.

Local Land Use Planning Assistant (LLUPA)
The LLUPA works under the Planning Team and acts as a local liaison. The LLUPA does research in order to obtain information about existing conditions in the chapter and helps to inform the Planning Team about new information that develops.

Who is affected?

The Navajo Nation
Development resulting from the implementation of the Land Use Plan will affect the Navajo Nation in terms of commerce, providing jobs, and increasing income. As each of the 110 chapters adopts a Land Use Plan, the Nation will become stronger as a whole.

The Chapter
The adoption of a Land Use Plan is essential in fulfilling the Local Governance Act, which allows the local chapter to make more decisions concerning its own policies. The chapter also benefits from increasing commerce, new jobs, new development, increased tourism and increased public awareness.

The Individual
The Land Use Plan designates land for specific uses such as new homesites and proposes new infrastructure for new and existing homesites. The individual residents of the chapter also benefit from new jobs from construction or incoming businesses. Fulfillment of the Local Governance Act requirements will allow for a more localized government with better awareness of their personal needs.
The Office of Navajo Government Development requires that each Planner is to have a Local Land Use Planning Assistant (LLUPA) to work under direct supervision of the Planner and assist in all stages of the planning process. The LLUPA is a local resident of the chapter whose various functions include locally obtaining research, data and maps, assisting in the organization of meetings and public hearings, dispersing information and coordinating local planning activities.

The LLUPA has been key in gathering information from local offices and different divisions under the Navajo Nation. Because the LLUPA resides on the Navajo Nation, they can communicate freely with the people who provide us with information and are allowed easier access to these sources.
Considerations
In order to understand what all is entailed in the planning process, it is important to recognize some fundamental concepts of the planning field if the result is to be a useful tool in guiding development and if the planner is to operate effectively.

Planning is an ongoing process and must be considered as a framework for guiding the process rather than an imposed development pattern.

One output of the process should be a detailed program for implementation that identifies what should be done, who should do it, when it should be done, how it should be done, how it can be monitored and how it can be paid for.

Planning is an overview in which the big picture is of great importance.

One of the principal responsibilities of the planner is to coordinate the process and communicate with all the agencies and individuals that are involved with the project.

Planning is done based on the qualities of a particular area and the people who reside, work, relax, travel, or have an interest in the area. It does not serve a decision-making function, but provides information that will aid in future decision-making.

Awareness of Need
The process of planning is usually sparked by interest in a particular problem or need, which may be quite specific, or very general. In this case, the Office of Navajo Government Development has obtained funds through the Native American Housing Assistance and Self-Determination Act (NAHASDA) for developing a community-based land use plan emphasizing designation of land for affordable housing and coordination of infrastructure development.

At this stage, ample information is already available to identify which parties are concerned and what the important issues are. The outcome of this planning process will be dependant upon and have effects on various Navajo Nation agencies including the Navajo Land Department, Navajo Housing Authority, the Navajo Tribal Utility Authority, Bureau of Indian Affairs and more. Some major issues that have been identified through communication with these agencies include the extension of water, power, sewer, sanitation and utilities through the chapter, location of new roads and extension of existing roads, location of new affordable housing, encouraging commercial and economic development, and meeting the educational needs of the community, among others.

The public should be involved as early as possible in the process and coordination among various groups should be established quickly. This includes the scheduling of public events with the Community Land Use Planning Committee and various other members of the community. The meetings that have been conducted to date have been instrumental in identifying current conditions in the chapter and recognizing the importance of various issues that must be addressed.

Data Collection and Analysis
The second step is to collect data and synthesize an analysis based on the need that was identified beforehand. Some of this information would be first hand, or gathered directly from the source. Secondary information is also essential, and is gathered from sources that have already compiled it. The goal is to learn more about the causes of the problem at hand and to better understand how it might be solved. In general, a plethora of secondary information is often available from existing sources, including census data, economic indicators, and a variety of existing planning documents. Additional primary information such as transit boarding counts, origin and destination surveys, or housing surveys, are often gathered as part of this process also.

At this stage, the Local Land Use Planning Assistant (LLUPA) becomes a key part of the process. The LLUPA works under direct supervision of the planner to obtain data and maps from various agencies, assisting in Community Land Use Planning meetings and public hearings, sharing and coordinating information, and other general assistance throughout the project.
Development of Goals and Objectives

Although the words “goals” and “objectives” are used interchangeably, there is a distinct difference. Goals are general in nature, conditions that can be attempted but may not be fully achievable. Objectives are much more specific and seem to be easier to accomplish. They have been examined in depth and plans will be made to attain them. Courses of action are to be judged in relationship to how well they address the objectives. Objectives may be quantitative or qualitative, based on what is most appropriate to the issue. They should be worded in a way that makes its measure of achievement apparent. Most goals will be laid out fairly early in the process, while objectives will be determined after close examination of the goals. The primary goal of this process, laid out by the Navajo Nation, is to develop a community-based land use plan that will emphasize the designation of land for affordable housing and infrastructure development. Through this process, other areas may be identified for commercial, agricultural, industrial, recreational and other land uses.

Objectives for the Chapter will be further delineated as the planning process moves along, but will include specific targets such as the placing of utility lines in a particular area, offering new services to chapter residents, establishment of new agencies to coordinate various functions within the chapter and more.

In the past, setting goals and objectives was delegated only to elected officials, planners, or local planning commissions or boards, but the participation of citizens and interest groups has become more and more vital in the process. The tasks of interpreting and organizing these objectives and goals will be left up to the professional planning team. Their expertise is based on experience in similar situations and collective knowledge of what the planning process is to achieve.

Clarification and diagnosis of the problem

After a statement of goals and objectives has been formulated, the problem and the environment within which it is found need to be clarified and the situation diagnosed. This may also involve creating a hierarchy among the objectives, determining which are most important, and which are desired but not essential. We may find that our initial response is not the most practical after reviewing it in relationship to its effects on other objectives. For example, if an airport has been overcrowded with traffic, the first response would be that a new airport is needed. However, if we look deeper into the problem, we may find that reorganization of the management would solve the dilemma, or even redirecting traffic to another airport. In almost any situation, problem identification and diagnosis can lead to better options. Alternatives presented in response to this analysis tend to be even more responsive to the goals and objectives. In any type project, needs and problems must be clearly stated in order to receive appropriate solutions as the end result. Again, community involvement is essential in order to understand and define the scope of the problem.

Identification of Alternative Solutions

Various alternatives can generally be formulated to meet planning objectives, and any single idea or combination of ideas may be appropriate in the given situation. It is important to have an all-inclusive list of alternatives. Presenting only one course of action is a poor planning practice and can be dangerous and inefficient. Any involved parties should be given the opportunity to propose a solution for meeting the planning objectives. An alternative presented by an interested group or individual could end up being the most appropriate solution. This is why it is important for the planning committee to keep an open mind to be successful in the planning process.

When formulating optional solutions, several objectives will need to be considered. One approach is to choose a course of action that provides the most benefit concerning each of the stated objectives. Multi-purpose objective alternatives can be formulated, but only after evaluation of the single-purpose alternatives. These alternatives may vary based on the importance given to certain objectives over other objectives. The best multi-purpose objective is one that maximizes the overall objective without drastically minimizing any single objective. Constraints and parameters that are beyond the planners' control may also make one solution less feasible when compared to the others. A successful solution must also be flexible in order to accommodate unforeseeable changes after the planning process is complete. Public participation should again be encouraged at this critical phase, which may mean presenting the alternatives and employing procedures for assessing impact.
Analysis of Alternatives
This step involves determining the effects or impacts of each optional solution by detailed forecasting of variables that will influence how each alternative will perform if implemented. Impact should be assessed in terms of physical, social, economic, fiscal, environmental, and aesthetic implications on the study area. Impact assessment is done with a significant amount of input from the affected groups in which they scrutinize each alternative as it relates to the group’s own specific objectives and concerns. Based on the opinions of these groups, we can determine which solutions will satisfy more people. The results should also be presented in a way that allows clear and meaningful comparison amongst the alternatives.

Development of Implementation Program
There are two ways to address implementation, prescriptive or descriptive. A descriptive approach would involve making broad statements about general steps to be taken to satisfy the issues. A prescriptive approach describes implementation in which specific steps are laid out to be followed in the way a doctor “prescribes” medicine. The approach chosen should be based on the individual needs of the specific project and the people who will be carrying out the plan. The plan will be presented in the form of written narratives, maps, and diagrams to explain existing conditions, projected needs, and suggested developments. Suggested developments could be at various scales, from overall road and utility location to design guidelines for specific buildings.
Generally the plan is adopted and carried into operation, depending upon the outcome of the planning process. Occasionally, however, a demonstration project may be carried out to allow the implementing agency and its clients to build experience with the project. This also allows further refinement of the solution process. Depending upon what resources are available, it may be feasible to begin with only one phase of the planning solution at a time. If the means are available, it may be best to tackle all phases at once, although they may need to be divided among various people and agencies for execution.
Implementation can be the hardest part of the planning process to accomplish, but difficulties can be reduced if the interested parties are involved throughout the entire planning process. This stage may include assembling and organizing the necessary legal documents, securing financing, contracting, hiring or assigning persons to do the work, scheduling milestones, and a variety of other tasks. If these needs are addressed during preparation, a minimal number of obstacles will be encountered.

Surveillance and Monitoring
Monitoring provides feedback for officials to determine whether the selected course of action is producing the effects that they anticipated and to assess the performance of the planning process concerning the achievement of the objectives. Corrections can be made if needed and unexpected problems can be addressed. Changing factors may alter the expected outcome of the chosen course of action and may merit a reevaluation of the completed planning process. This step is often the end of the process, but may be the beginning of a new planning process in order to meet the changing needs of the Chapter.
identify problems and needs

collect and analyze data

develop goals and objectives

clarify and diagnose problems or issues

identify possible alternatives

analyze alternatives and assess impacts

evaluate and recommend alternative for selection

develop detailed implementation program

evaluate/manage
Community planning meetings are a primary influence in providing accurate direction for the planning process. The people of the community are the most qualified to identify existing conditions and current and projected needs. It is essential in the planning process to have the input of the people to most effectively address the issues of the area. Planning meetings also allow the Planning Consultant to keep the people of the community informed about the progress of the project and to get feedback on the decisions that have been made throughout the process. In order for the meetings to be fully effective, it is also fundamental that chapter officials promote them and encourage the people of the chapter to get involved with the process.

The Community Participation Plan is intended to help educate the public about the planning process and organize public meetings for the Community Land Use Planning Committee, the Planning Consultant, and the members of the community. The Planning Team was required to participate in six community meetings over the course of the project. We satisfied the once a month meeting requirement of the contract by having the LLUPA represent us at the monthly CLUP meeting and relaying the information to us prior to our next presentation. The Chapter officials and citizens then had the chance to give feedback and input during the public presentation.

Please refer to appendix section A-21 for a more detailed description of the chapter meeting discussions.

**NAVAJO MOUNTAIN CHAPTER PLANNING PARTICIPATION SCHEDULE**

**First Public Meeting**

Dec. 7

At the first public meeting we had personnel introductions, explained the purpose of the project and discussed the expected results of the deliverables. Concerns were about boundary lines, and planning areas. Specific topics discussed were: Grazing rights, Water resources, Tourism, Creating jobs, Housing, trail, and marina/golf resort, sewer capacity issues, existing community facilities, water storage, water wells, and the proposed schedule. Based on this discussion of the public's concerns, we began to strategize an approach for planning the chapter and to develop the basis for the Land Use Plan document.

**Second Public Meeting**

March 1

The second meeting explained the planning process and how it related to the overall project and pertinent data. We presented base maps delineating existing Chapter Planning boundaries, physical features, and landmarks. The initial data gathering we completed one month previous was distilled down to a planning needs board, which dealt with such issues as infrastructure, economy, community development, housing, etc. At this meeting more comments were made pertaining to the desired future of the Chapter from the people who live there. Specific topics discussed at this meeting were: The resort, more discussion about the types of tourism, different areas for development, the Chapter's participation to date, and the Navajo Religion. This discussion led to further clarification of the existing status of the chapter and allowed us to analyze how the existing needs should influence the strategy for planning.
May 8  

Third Public Meeting

The third public meeting again presented ideas and data from a conceptual viewpoint. We covered critical data from the LUPA's work. We hoped to have all existing infrastructure identified (i.e. water, sewer, electrical). Also, the existing physical features were identified along with soil types, endangered species and culturally significant areas. Preliminary results from the survey were compiled. We defined and summarized the progress of the community assessment portion of the project at this meeting. Specific topics discussed were: Young people and housing, infrastructure to housing, senior housing, jobs, grazing and planning. The information we gathered helped us to analyze the ideas we had proposed and to develop them further.

July 13

Fourth Public Meeting

At the fourth meeting we departed from the conceptual and presented what could be called a preliminary final plan. This plan was based on a realistic view of what ought to be for the future land use plan. All survey data was compiled and presented. All land uses issues were resolved and special projects conceptualized. Preliminary land suitability analysis and infrastructure analysis were reviewed and reported at this meeting. Specific topics discussed were commercial parcel development, Grazing conflicts with land use, and community facilities. The group decided that the proposed golf course was not feasible in the proposed location because of the rock and cost to build. We were able to refine the Land Use Plan and address the concerns that the public had.

Sept 1

Fifth Public Meeting

This meeting incorporated any final comments from the fourth meeting and again refined and focused on the final land use plan and all of its elements. All pieces of the final report were identified and presented. We went over the specific areas of development and reviewed the proposed land use plan. We presented the revised resort and golf course plan. We were able to make final adjustments to the document to assure the Chapter's satisfaction with the outcome of the planning process.

September 11, 2001

Terrorist Attack, All travel suspended

Nov. 12

Sixth and Final Public Meeting

Presented final draft report along with associated maps, charts, specific land use plans, residential subdivisions, and final conceptual idea for any other projects the Chapter has identified through the planning process. This presentation was the culmination of a year's worth of work. The Chapter requested to add more information on solar energy and community design ordinances.
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<td><strong>APPROX. DATE:</strong> January 19, 2001</td>
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<tr>
<td><strong>GOAL/OBJECTIVE</strong></td>
<td><strong>GOAL/OBJECTIVE</strong></td>
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<tr>
<td>Introduce program and team to club committee. LUPA process begins.</td>
<td>Identify topics of study; brainstorming.</td>
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<td><strong>SUMMARY/DISCUSSION</strong></td>
<td><strong>SUMMARY/DISCUSSION</strong></td>
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<tr>
<td>Schedules, deliverables of project, expectations, planning process, jobs</td>
<td>Balancing natural beauty with development, jobs, tourism, 160 acre development, neighborhoods, roads</td>
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<td><strong>GOAL/OBJECTIVE</strong></td>
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<tr>
<td>Refine topics, identify committee's involvement</td>
<td>Review public meeting data, finalize study areas</td>
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<td><strong>SUMMARY/DISCUSSION</strong></td>
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<td>Piute Mesa subdivision, equestrian trails, golf course development, drainage to Lake Powell.</td>
<td>Land use issues with 160 ac. Infrastructure required, old windmill site, deep canyon areas.</td>
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<td><strong>GOAL/OBJECTIVE</strong></td>
<td><strong>GOAL/OBJECTIVE</strong></td>
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<td>Review conceptual ideas of planning process and community master plan.</td>
<td>LUPA data gathering, surveys, how chapter input influences design</td>
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<td><strong>SUMMARY/DISCUSSION</strong></td>
<td><strong>SUMMARY/DISCUSSION</strong></td>
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<tr>
<td>Planning principles of specific areas, lot sizes, infrastructure</td>
<td>LUPA survey data, compiled, farming communities</td>
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### JUNE

**APPROX. DATE:** June 22, 2001

**GOAL/OBJECTIVE**
Review of preliminary findings, specific project designs.

**SUMMARY/DISCUSSION**
Sawmill, rodeo, parking requirements

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### JULY

**APPROX. DATE:** July 20, 2001

**GOAL/OBJECTIVE**
Review and discussion of public meeting, impact of real projects

**SUMMARY/DISCUSSION**
Marketing of facilities, one-acre lots

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### AUGUST

**APPROX. DATE:** August 17, 2001

**GOAL/OBJECTIVE**
Continue project refinement, lock on master plan

**SUMMARY/DISCUSSION**
Hotel discussion at Sawmill town center, opportunities!

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### SEPTEMBER

**APPROX. DATE:** September 21, 2001

**GOAL/OBJECTIVE**
Review public meeting, revise and refine rough draft reports

**SUMMARY/DISCUSSION**
Circulation aid to surrounding chapters

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### OCTOBER

**APPROX. DATE:** October 19, 2001

**GOAL/OBJECTIVE**
Review for final draft report

**SUMMARY/DISCUSSION**
Roads to private and golf, resort/marina, strategy to define boundary

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### NOVEMBER

**APPROX. DATE:** November 9, 2001

**GOAL/OBJECTIVE**
Prepare for final public meeting and any last chapter input

**SUMMARY/DISCUSSION**
Follow thru of report and implementation
<table>
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<tr>
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<tr>
<td>7\textsuperscript{th} – First Public Meeting</td>
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<td>August 2001</td>
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<tr>
<td>March 2001</td>
<td>September 2001</td>
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<tr>
<td>1\textsuperscript{st} – Second Public Meeting</td>
<td>1\textsuperscript{st} – Fifth public meeting</td>
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<td>11\textsuperscript{th} – Travel Suspended</td>
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<td>May 2001</td>
<td>November 2001</td>
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<tr>
<td>8\textsuperscript{th} – Third Public Meeting</td>
<td>12\textsuperscript{th} – Sixth and Final Public Meeting,</td>
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<td>June 2001</td>
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</tbody>
</table>
Our planning approach from the beginning was community based. The scale of the project is very large in area and in scope. We realized very early on that we could not and would not be able to apply just any planning theories or normal thought processes to the individual Chapter. By being a community-based process we were guaranteed to represent the ideas and thoughts of the people who lived in the Chapter and the surrounding areas. The early meetings established the direction of the projects with brainstorming sessions with all that wanted to have input. We met with the Chapter officials before the public meetings to refine agendas and establish main topics for the open forum. The Chapter officials were in total agreement with our approach. Our boards and handouts were valuable tools for the people to understand the ideas and thought processes that the approach revealed. Although the language barrier was there at times, the translations worked, and at times added a unique interaction between people. At each of the following meetings we would update our plans to incorporate the previous meetings data and discussion. There were times when we did have to start over because the idea or location was misinterpreted. For the most part we have represented what we believe to be the Chapter’s wishes for growth and development. We also hope that the plans presented in this report actually get implemented and receive the anticipated growth the way the people desired.
This section includes information on the existing conditions within the chapter and the desires of the community for development. Much of the information compiled here was obtained through public meetings with chapter members. The evaluation of this information provides the basis for the proposed Land Use Plan, presented later in this document.
The vision for the Navajo Mountain Chapter is to balance development of the chapter with preservation of its natural beauty. Rainbow Bridge and Lake Powell each draw hundreds of thousands of tourists every year. If the chapter were to develop a world-class resort along with a golf course, it would serve to establish Navajo Mountain as a premier destination. At the same time, the overarching goal would be to provide the opportunity for people to enjoy the natural scenic beauty of the surrounding landscape in its natural state. The establishment of reliable infrastructure will lead the way for development and is a key factor for the future of the Navajo Mountain chapter. Once the infrastructure is in place, then development will follow, which will in turn be followed by an increase in tourism. An increase in tourism will generate more jobs, and improve the unemployment situation within the chapter. This will then encourage the building of new housing for people that already live there, and as more workers will be needed, new housing will be built for them. All this must be handled with special attention on the delicate balance between progress and the respect for nature.
The need for suitable housing was identified by the Navajo Nation and the Chapter as one of the primary reasons for developing a Land Use Plan. Some other needs have been identified through discussion with the citizens of the chapter at various town meetings. The following topics have been identified as high priority.

Water
The chapter is lacking sufficient water storage and distribution. Some existing water storage also needs to be upgraded. There are also few sources for fresh water. A major issue was the fact that a good portion of natural water drains across Navajo Mountain Chapter and on into Lake Powell without the Chapter taking advantage of it. Other ideas that came out as future discussion items were: storage tanks, natural irrigation, and potential new lake locations.

Economy
Because of its proximity to several natural resources, Navajo Mountain is in a location that would allow it to become a destination for people with all sorts of interests. Navajo Mountain, Lake Powell, and Rainbow Bridge are all located within the chapter and already draw thousands of tourists to the area per year. By providing accommodations and roads, the chapter could take advantage of all these assets. The chapter has also expressed interest in improving the community for the benefit of its residents in order to improve the quality of life in the chapter. Other ideas that came out as further future discussion items were: Hotel/Resort/Golf, Navajo Mountain, Rainbow Bridge, Lake Powell, Cattle, and Agriculture.

Roads
One thing that is holding back development in the Navajo Mountain area is the lack of easily accessible roads. The provision of strategically placed roads could encourage more tourism and commerce. Other issues related to circulation are Connection to Ojito, UT or Halls Crossing, connection to Kayenta, and the distribution of products throughout the Chapter and Navajo Nation.
### Community Demographics

#### Employment Status

<table>
<thead>
<tr>
<th>Subject</th>
<th>Navajo Mountain CDP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
</tr>
<tr>
<td>Population 16 years and over</td>
<td>246</td>
</tr>
<tr>
<td>In labor force</td>
<td>113</td>
</tr>
<tr>
<td>Employed</td>
<td>87</td>
</tr>
<tr>
<td>Unemployed</td>
<td>26</td>
</tr>
<tr>
<td>Not in labor forces</td>
<td>133</td>
</tr>
<tr>
<td>EDUCATIONAL ATTAINMENT</td>
<td>NAVAJO MOUNTAIN CDP</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Subject</td>
<td>#</td>
</tr>
<tr>
<td>Population 25 years and over</td>
<td>201</td>
</tr>
<tr>
<td>Less than 9th grade</td>
<td>85</td>
</tr>
<tr>
<td>9th to 12th grade, no diploma</td>
<td>20</td>
</tr>
<tr>
<td>High School graduates (includes equivalency)</td>
<td>35</td>
</tr>
<tr>
<td>Some college no degree</td>
<td>32</td>
</tr>
<tr>
<td>Associate degree</td>
<td>5</td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>24</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>0</td>
</tr>
<tr>
<td>Percent high school graduate or higher</td>
<td></td>
</tr>
<tr>
<td>Percent bachelor's degree or higher</td>
<td></td>
</tr>
</tbody>
</table>

**Navajo Mountain CDP Educational Attainment by Percent**

- Less than 9th grade
- 9th to 12th grade, no diploma
- High school graduates (includes equivalency)
- Some college no degree
- Associate degree
- Bachelor’s degree
- Graduate or professional degree
### Community Demographics

<table>
<thead>
<tr>
<th>Income In 1999</th>
<th>Navajo Mountain CDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>#</td>
</tr>
<tr>
<td>Households</td>
<td>108</td>
</tr>
<tr>
<td>Less than $10,000</td>
<td>35</td>
</tr>
<tr>
<td>$10,000 to $14,999</td>
<td>28</td>
</tr>
<tr>
<td>$15,000 to $24,999</td>
<td>6</td>
</tr>
<tr>
<td>$25,000 to $34,999</td>
<td>13</td>
</tr>
<tr>
<td>$35,000 to $49,999</td>
<td>14</td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
<td>7</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
<td>5</td>
</tr>
<tr>
<td>$100,000 or more</td>
<td>0</td>
</tr>
<tr>
<td>$100,000 to $149,999</td>
<td>0</td>
</tr>
<tr>
<td>$150,000 to $199,999</td>
<td>0</td>
</tr>
<tr>
<td>$200,000 or more</td>
<td>0</td>
</tr>
</tbody>
</table>

- Median household income (dollars): $14,196
- Per Capita income (dollars): $6,265
- MEDIAN EARNINGS (DOLLARS)
  - Male full-time, year-round workers (dollars): $8,750
  - Female full-time, year-round workers (dollars): $23,750

[Diagram: Pie chart showing income distribution in 1999]
US Census 2000 information for Navajo Mountain

Maps provided by US Census Bureau

Navajo Mountain Chapter

Boundaries
- 00 Am Ind Area
- 00 Am Inc Area
- 00 Off-Res TL/SL
- 00 Off-Res TL/SL
- 00 Tribal Tract
- 00 Tribal RG
- 00 ARE
- State
- 00 County
- 00 Place
- 00 Urban Area
- 00 Urban Area

Features
- Major Road
- Streams/Waterways
- Streams/Waterbody

Navajo Mountain CDP*

Boundaries
- State
- 00 County
- 00 Co Sub
- 00 Subdivision
- 00 Place
- 00 Place
- 00 Con City
- 00 Urban Area
- 00 Urban Area

Features
- Major Road
- Street
- Streams/Waterways
- Streams/Waterbody

*CDP - Census designated place (as defined by the U.S. Census Bureau)
A statistical entity, defined for each decennial census according to Census Bureau guidelines, comprising a densely settled concentration of population that is not within an incorporated place, but is locally identified by a name. CDPs are delineated cooperatively by state and local officials and the Census Bureau, following Census Bureau guidelines. Beginning with Census 2000 there are no size limits.
LLUPA Survey

In order to gain a more accurate view of the people of the Navajo Mountain chapter than could be provided by U.S. Census information, we created a survey for the LLUPA to distribute. These surveys were also distributed at the public meetings. There was, however, no response from the people of the chapter. Included here is a copy of the survey used originally. This survey was revised in order to eliminate questions about income and redistributed, but the response did not improve.

### CHAPTER PLANNING SURVEY
(Please limit one per household)

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
<th>Age</th>
<th>Marital Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(S – Single, M – Married)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(X – Separated, D – Divorced)</td>
</tr>
</tbody>
</table>

Please list the ages and sex of the occupants living in your household.

What is your level of education?
- Less than High School
- High School or Better
- Some College
- Associate Degree
- Bachelor’s Degree
- Graduate Degree

What is your annual household income?
- Less than $10,000
- $10,001 to $20,000
- $20,001 to $30,000
- $30,001 to $40,000
- $40,001 to $50,001
- $50,001 to $60,000
- $60,001 to $70,000
- $70,001 or Higher

What sort of dwelling do you live in?

How many rooms do you have in your dwelling?

What is your occupation?

How many miles do you travel to work?

What are the road conditions?

Have you seen any increase in your annual income?

What would you like to see develop in your Chapter? (e.g. programs, day care, facilities, events, etc.)

What programs/facilities do you have now that you feel need improvement?

Other specific/general comments or suggestions you would like the Consultant to incorporate into the Chapter Master Plan.
Because of the vast size of the Navajo Mountain chapter, 389,000 acres, it was very difficult to locate each individual homesite or land withdrawal. Instead, we have identified the overall land use characteristics of several core areas on map 2-5.

1 This area is the most populous zone of the chapter and is often referred to as Rainbow City. Nearly half of all the occupied housing units in the chapter are located in this area. It also includes the Navajo Mountain Boarding School, the Navajo Mountain Chapter House, San Juan Southern Paiute Reservation, Rainbow City Assembly of God Church, Navajo Mountain Preschool, Navajo Mountain Community Warehouse, and Naa Tsis Aan Community School. The US Census Bureau refers to the area as Navajo Mountain CDP, or Census Designated Place. A CDP is a statistical entity, defined for each decennial census according to Census Bureau guidelines, comprising a densely settled concentration of population that is not within an incorporated place, but is locally identified by a name. CDPs are delineated cooperatively by state and local officials and the Census Bureau, following Census Bureau guidelines. Beginning with Census 2000 there are no size limits.

2 This area contains primarily scattered housing and open space. There is little or no commercial or industrial development. The Navajo Mountain Mission is located in this area.

3 This area contains a large amount of farming and grazing land and some scattered housing.

4 This area is basically undeveloped because of the steep slopes and lack of infrastructure.

5 This area is basically undeveloped because of the steep slopes and lack of infrastructure.

6 This area is also mostly undeveloped, but the canyons connected to Lake Powell are used for recreation.

7 This area includes Navajo Mountain and is considered a sacred site.

8 This area includes Rainbow Bridge National Monument and is considered a sacred site.
Some important locations in land use zone 1 and 2 are designated here.
Navajo Mountain Chapter Planning Area

Refer to 2-4 for description of each land use area
Existing and Future Residential Needs

As with many Navajo chapters, there is a shortage of housing, and many of those who actually rent or own a home do not have utilities. As previously stated, one of the primary goals of the Land Use Planning process is to designate areas for new housing.

According to the 2000 U.S. Census, there are only 322 total housing units in all of the Navajo Mountain Chapter, and of these, there are only 187 units that are actually occupied. Ninety-three occupied units, nearly half of these, are located within the Navajo Mountain CDP (Census Designated Place), an area that includes the chapter house and school. Based on an annual growth rate of 2.5 percent, the Navajo Mountain Chapter will need approximately 52 new housing units in the next ten years.

<table>
<thead>
<tr>
<th>Total Population 2000</th>
<th>632</th>
<th>Navajo Mt. Chapter</th>
<th>379</th>
<th>Navajo Mt. CDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected Population 2005</td>
<td>715</td>
<td>429</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 year Increase</td>
<td>83</td>
<td>50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected Population 2010</td>
<td>809</td>
<td>485</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 year Increase</td>
<td>177</td>
<td>106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied Housing Units 2000</td>
<td>187</td>
<td>93</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected Housing Units Needed 2005</td>
<td>211</td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 year Increase</td>
<td>24</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected Housing Units Needed 2010</td>
<td>239</td>
<td>119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 year Increase</td>
<td>52</td>
<td>26</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Projections based on 2.5 percent annual growth rate.

The approach to building homes in the past has been very haphazard and disorganized. There are few "neighborhoods" or planned housing areas in the chapter. There has been some problem with homes being built without going through the Lease application process. Those who want the homesite simply go to the landholder and ask permission. People get tired of waiting so many choose to buy mobile homes. Most people end up waiting around three years to get a home. Also, there are currently no local contractors or builders in the area.

There are fifteen Home Ownership Housing Units at the NHA Housing location (see location key 12). The housing will become the ownership of the individual paying at the end of the contract. Homeowners go through the process using NHA Housing guidelines. At the present time, the Indian Health Services is reluctant to offer approval for additional housing until further water sources can be obtained. The Feasibility Study conducted by the Department of Water Resource is an attempt to do just this. The present Housing sits on approximately 15.0 Acres of land withdrawn by the Navajo Mountain Chapter in 1980.

A new subdivision is possible in the Rainbow City area. The houses and utilities that run to the edge of the canyon will have water and electric service. This housing tract will encompass 75 acres (see location key 2). Another possible scattered housing site is on the Plate Mesa.

A total of ten Public Rental Units have been constructed to assist people needing housing for a period of time whether for students to attend the local school or for employment purposes. Some people come from remote area of the community; others may be pending housing assistance from the chapter.
The following map shows the locations of one hundred homesites where each number represents an individual existing home.

Through discussions with chapter residents, we learned more about what types of housing arrangement are preferred. We investigated alternatives through drawings and narrative (section 2-7) and presented this exhibit to the people. This allowed us to get very specific feedback about the needs of the individual area. We also learned that people within the Navajo community tend to want a certain amount of privacy, so duplexes and apartments, as well as small lots, are not desirable.

Through our discussion and investigation, we also learned that there are some drawbacks and hindrances to building a new home. For example, chapter members desiring a home must first apply for a Homestie Lease. This is a difficult process in which the land being applied for must be withdrawn from the public lands and then re-designated as a homestead, and can drag on for years. Applicants need to have a Homestie Lease in order to develop any land. These leases are passed down from generation to generation. The chapter must first approve the lease application by resolution approved in a chapter meeting. The family then submits the application to the Land Department in Ft. Defiance for processing. The Grazing Officer must check the land and approve the application. The Chapter, Land Administration Office, and BIA all keep records of where the site would be. Demand for these Homestie Leases is high, but they are very hard to get because much of the land is currently used for grazing and you must have permission from the Grazing Permeites. The Archaeological Clearance fee is $300.00, which most of the low-income applicants cannot afford. We learned that many people who are interested in building a new home are not familiar with the process they must go through and do not know what action they must take. For that
reason, we have provided an overview of the Homestead Lease process located in the appendix (section A-15). We also feel that the local governments, as well as the Navajo Nation, should take a more active role in educating the people about the requirements.
The Navajo Nation has a strong respect for family and families tend to live very near to their relatives, out away from modern conveniences such as water, electricity, and sewer. Many different housing alternatives and layouts were developed to help blend the modern conveniences that people desire for daily living and the "breathing room" the Navajo people desire.

Scheme "A" has several different housing arrangements, on a variety of different lot sizes. All of which are located just off the main utility truck lines, which run along the main road. By servicing the housing in this manner it greatly reduces the cost of utility installation, materials, and maintenance. The upper left corner has four homes, each on a one-acre parcel. This allows families to live close together and still have room to have animals or other items.

The upper right hand corner has nine homes on four acres. Each home is on a third to half-acre parcel. The homes are placed towards the back of the lots to give more separation between the street and the homes. Having more homes on a particular street decreases the cost of utilities. The smaller lots and homes make excellent places for single people or young couples just starting out to live.

The bottom left corner has eight homes on four acres. Two homes are one acre each, two homes are on a half-acre parcel and four homes are on a quarter acre parcel. The four homes that run along the road are good starter homes for the younger generations and the larger lots allow the more established families to have more room for livestock.

The bottom right corner has two homes on an acre and a half for those who need large land area. The four quarter acre lots utilize the street frontage for direct utility access.

Between the four quadrants would be a public access area. Walking trails and a park like area would give citizens a place to gather.

Scheme "B" has many different lot sizes and configurations much like those in Scheme "A". The advantage of this scheme is the line of homes run along the main utility line. Any combination of home arrangements can run along the length of the street and the utility line can be any length necessary, which could easily be extended.

Scheme "C" is an adaptation of the traditional hogan housing. There are three hogans grouped together, which would help reduce construction. The grouping creates a park in the center of the
complex, which is an excellent place for children to play or families to gather. The community that it creates is a good place for single people, single parents, or small families to live for less money.

Scheme "D" would create housing on a grid system more typical of a residential neighborhood. The main difference is that the lots are very large and the houses are more spaced out. In each of the quadrants the centers are open for shared grazing area. This allows people to live on smaller lots, but can still have access to large grazing area.

Scheme "E" has traditional hogans placed on a typical residential street. Some people prefer to live in a more traditional setting, but want modern conveniences. This is a good blending of both.

All the housing alternatives give the best to the people and can improve their standard of living. Citizens can live on a variety of different lot sizes depending on their personal needs. They will have access to all utilities, many of which they currently do not have. The layouts also make the utility company's job very easy. They are laid out in a manner that makes installation easy and future maintenance cost effective.
For the past 300 years, the Navajo of this area have had a livestock oriented culture. During the early part of this period, the people of this semi-nomadic culture raised sheep and horses that were the primary users of the range feed. Cattle numbers have increased in recent years. Today, based on economics, horses and burros are secondary users of the range plants. However, they are strong competitors for the range forage due to the increasing numbers. Since the beginning of the twentieth century, the Navajo people have struggled to reach a balance between modern policies and their traditional migratory/nomadic herding practices. The Navajo people are attempting to restore equilibrium among animals, land and people by creating new opportunities to blend traditional values with modern policies.

The chapter would like to irrigate certain areas for agriculture to allow better crops and larger quantities to be produced. This would provide more products that could be sold within the chapter and even sold to other chapters for more income. Irrigation would also create better grazing areas that could in turn allow more cattle to graze. This would produce more meat that could be sold to chapter residents, as well as the local school and stores. The chapter mentioned a siphon dam technique to irrigate with water from existing streams, such as the spring in Tall Mountain. Collaboration between local sheep herders and cattle farmers could allow for greater efficiency of grazing.

Within the Navajo Mountain area and within the Coconino County portion of the community, there are three approved Range Management Unit areas. The approvals were made at the District Two Grazing Committee meetings, the local Chapter meeting and through the Navajo Nation Council's Resource Committee. The Bureau of Indian Affairs made final approval at the end of the process. The local land users also took part in the Granting of Consents. The applicants for proposed Range Management Unit devised plans as to how they intended to improve their range area and to upkeep their land. The following people have Range Management Units and are situated in the Coconino County portion of the community.
Approximately four to five families have farm plots located at the bottom of the Lower Piute Canyon area. A spring is located above the plots that serve as irrigation to the area. Fruit trees are the common growth with squash and corn. The plots are handed down from generation to generation to continue the tradition.

Piute Canyon Farm Demonstration Project
Navajo Mountain Chapter

Families have farm plots in the Upper Piute Canyon farming area. Some of these plot owners are deceased, and family members wanting to assume ownership have to apply to land administration with chapter approval.
Existing and Future Commercial and Industrial Development Information

The Navajo Mountain community is situated in the northwest corner of the Navajo Nation and is isolated from most of the major development within the Navajo Nation. The community currently lacks all sorts of development, although it is located in a prime location for future economic development.

There are many constraints that are responsible for slow economic growth on the Navajo Nation. One major factor is the long and cumbersome business site leasing process. It takes 3 to 5 years to complete the process on the Navajo Nation, where the same permits can be received in 3 days in cities just off the reservation. This lengthy process discourages many prospective business owners from operating on the Nation instead of in the border towns. Because the land is held by the federal government and cannot be bought or sold, it cannot be used as collateral for start-up loans for new buildings. Many grazing permit holders are unwilling to give up part of their land for economic development. Businesses on the Navajo Nation are subjected to dual taxation, from the Nation and from the state. Few skilled entrepreneurs attempt to do business on the Navajo Nation because of the many restrictions. There are also very few Navajo people with enough capital to start their own business, and very few financial institutions to support businesses or industries. There is a lack of skilled labor, technology, infrastructure, housing and community facilities, and goods and services.

Despite these limitations, the Navajo Mountain Chapter has plans to pursue several proposed projects for the community. These developments will hopefully reduce the unemployment rate within the chapter. The following are the proposed projects.

Oil and gas production is a major industry at the Aneth Basin oilfield. Most other income is derived from the sale of wool, sheep, goats, and a small amount of cattle. The Black Mesa coal mining operation and an electrical generating plant at Page also provide several hundred job opportunities.

One major obstacle that has prevented economic development and growth has been the condition of the road leading into the community of Navajo Mountain. In the past, there were about forty-seven (47) miles of unpaved road, which has been graded and maintained by the Bureau of Indian Affairs on a once-a-month basis. There have been potential business people that had an interest in starting a business within the community. However, when they travel the road and find out how much it would cost to get merchandise and goods to their location, the development is often halted. The cost is too high when goods have to be delivered over the rough road. In 1981, improvement of paving the road began taking place. To date, about 20.5 miles have been paved, with an additional 7.0 miles undergoing construction and to be completed during the summer of 2001. Beginning in 2002 another 13.5 miles will begin construction with funding from the Bureau of Indian Affairs Federal Road Program and part of the Navajo Nation roads project. Utilizing the Federal Funds requires various clearances, which prolongs the process. Once the road pavement is completed in the community, the potential for economic development will increase.

Over 60% of Navajo money is spent in off-reservation communities because the Nation lacks wholesale and retail outlets and transportation. The people of Navajo Mountain have requested some facilities in their community, including a post office, a grocery store, a gas station, a Laundromat and a restaurant/motel. Residents have expressed a need for the types of business that can aid them in their everyday life, such as tractor repair, farm supply, etc. The nearest community that has these facilities is Kayenta, which is an hour and a half away. Residents also visit Page and Cortez for these facilities. The development of a new
commercial area would encompass the building of roads, the cost of handling and maintaining vehicles, and preparing the area for commercial and retail use.

There is some timber on Navajo Mountain that is protected by strict regulation. However, a large amount of timber is wasted because trees that fall naturally are not harvested and end up rotting in the forest. This causes more harm than good. If a timber management committee were implemented, these wasted resources could be used to create jobs and income for the chapter.

Tourism accounts for 90% of all income made within Navajo Mountain, although most people do not work within Navajo Mountain and travel to other towns. The Navajo Mountain community has a lot to offer to the tourism industry. There are places within the community where travelers can just get away and relax or enjoy the natural beauty of the Chapter.

The Lake Powell Tribal Recreation Area covers over 2 million acres on the southeastern shores of Lake Powell and receives over 500,000 visitors annually. The lake was formed by the creation of the Glen Canyon Dam in 1956 in order to assure downriver states the necessity of water. The Glen Canyon National Recreation Area was established in 1972. Lake Powell has four full service marinas with accommodations and dining offered at some of these. Powerboats, personal watercraft, kayaks and houseboats are available for rental and there are cruises to Antelope Canyon and Rainbow Bridge as well as a dinner cruise and a paddle wheeler.

Rainbow Bridge National Monument is the world’s largest natural stone bridge. It spans 275 feet and is 290 feet tall at its crest. Rainbow Bridge was known for centuries by the Navajo and Paiute natives of the area, but was introduced to the public when President William Howard Taft created Rainbow Bridge National Monument in 1910. Before the construction of Glen Canyon Dam, travel to Rainbow Bridge included a long boat ride followed by a treacherous hike, totaling about three days. Since the creation of Lake Powell, access to the Bridge has been made much easier and brings thousands of visitors each year. Rainbow Bridge is a sacred religious site for the Navajos. After years of legal battling, a Management Plan was adopted for the area in order to mitigate visitor impacts and preserve resources. The area can be reached by boat from Wahweap, Halls Crossing or Bullfrog, or by foot if the proper permits are obtained before using these trails. Another proposal is to re-establish a trail to Rainbow Bridge National Monument directly northwest behind Navajo Mountain. Certain spots along the trail will be equipped with tables and necessities. The trail will have signs posted so that tourist will not wander off to other direction. The tour will have local Navajo guides either by horse back or on foot depending of the type of the trip. The community at the Chapter will collect fees.

There is a landing strip in the chapter, but the residents would like to add a heliport also. This would allow for easier travel for tourists. A helicopter would also allow hikers to be taken out to other interesting hiking and horseback riding locations, including lookouts, scenic points and canyons.
The Navajo Nation would like to provide a pavilion for outdoor meetings and a tourist facility that would host many activities, including biking, hiking, horseback riding. The state is also in support of the addition of some sort of resort. The addition of these tourist facilities would provide new jobs not only in construction, but also in the operation of the facilities.

During the March 18, 2000 the Naa Tsis Aan Community Land Use Planning Committee (NCLUPC) considered a “Concept Paper for the Proposed Economic Development Project” for the Navajo Mountain Chapter and Community, which proposed the development of a Visitor’s Center on High Mesa between Navajo Mountain and Inscription House. The Committee supported the effort for this project.

If another visitor’s center is built on the 160.0 acres within the Navajo County, the horse trail could end there. Tourists could continue on to their next destination, whether to the south or to the north of Navajo Mountain, to visit the famous Rainbow Bridge for more horse back riding, or for a good long hike.

Also at the March 18, 2000 NCLUPC meeting, the proposed Naskahi Marina project was considered and the committee supported the idea. This project was at one time pursued, but the idea was abandoned along the way.

The development of a business venture within the community needs to have the input from the people, both as individuals and collectively, because of the direct impact that will be made upon individuals, their livelihood, their environment and their social relationship within the community, and external associations. The people need to voice their concerns and make recommendations on what type of business and/or projects should be considered within their community. The emphasis in the overall planning for business development is to keep the local and regional area as natural as possible, which will remain a major incentive for future growth and development.
Existing and Future Community and Public Facilities Information

The Chapter government assists the local people with housing, temporary employment, student scholarship, training, and other youth services. Many of these are administered through the Central Navajo Nation government. Once the Chapter Governance is certified under the Five Management System then the chapter can administer local programs. The chapter now employs about 20 people.

The chapter is interested in community development such as a preschool, a senior center, senior housing, a recreation center, youth facilities, a community college, a vo-tech school and a trucking school.

Education

There are several different types of schools on the Navajo Nation. Some are run by government divisions and others are privately run. The following list describes the differences.

Public Schools - Just like any other local public school district. Funding is from local taxes, Federal Impact Aid, and State funds. Districts are responsible to the Arizona Department of Education and also pay State taxes.

Charter Schools - These schools are also funded by the State and have local boards, but may serve a narrower purpose than regular public schools.

Parochial & Private Schools - This includes church affiliated schools of a variety of denominations, as well as private academies.

B.I.A. Boarding Schools - At one time roads were so poor that students had to remain at school in dormitories. People lived too far from each other to make day schools feasible. With better roads and the growth of public schools, fewer families part with their children for long periods. In order to stay in business, boarding schools now often operate as day schools as well. They compete with other school districts for the same students, even sending their buses over the same routes used by public school busses.

Contract Schools - These are community, or B.I.A. schools contracted to be operated by an independent party.

Navajo Mountain High School - San Juan School District

The Navajo Mountain High School was built in 1998, ordered by Court Decree and Bond Election of the San Juan County Voters. It serves students of the Navajo Mountain community and has an enrollment of fifty-five students. The High School employs thirteen staff and has six trailer unit houses located on this piece of land. The school buses are not allowed to cross the state line, so students that live in Utah are met by the bus at the state line.

Navajo Mountain Community Pre-School

The Navajo Mountain Community Pre-School Center provides early childhood education to Pre school age children. There are approximately 13 students enrolled at the center, which employs one Head Teacher, one Teacher Aide and one Bus Driver. The center was constructed for a maximum of twenty-one students. If there are fewer students, then home-based type of teaching is provided. The Center was constructed in 1983 on a two-acre piece of land, which was never properly withdrawn by the chapter.
Existing and Future Community and Public Facilities Information

Naa Tsix Aan Community School - Lower and Middle School
In 1983, the Navajo Mountain Chapter conducted a groundbreaking ceremony for 93.75 Acres. The land is intended for Education purposes for the community and to be a community Resource Center. With this intent, the Bureau of Indian Affairs built the school for Kindergarten through Sixth grade. In 1986, the seventh and eighth grades were added. In 1998 the BIA School was converted to a Community Controlled School (Grant School). The school employs the following people:

- Academic: 20
- Residential: 8
- Kitchen: 4
- Facility: 3
- Administration: 7
- Transportation: 2

The school has a Facility Management building, a dormitory for 175 students, a kitchen, a dining room, a gymnasium, and an academic building. There are three duplexes and two two-bedroom trailers. The Naa Tsix Aan Community School is trying to get twenty additional houses at the school.

Old Navajo Mountain BIA Boarding School
About 21.58 acres was drawn for the Navajo Mountain BIA School (former BIA School). Natural stone octagon houses were built with an L-shape Dormitory. Students who attend the school live at the school. Kindergarten and first grade are the primary grades, with approximately 21 students. Presently, the stone buildings are not in use, but there are three buildings on the land that are being used as living quarters for the Community School staff.

Long distance learning is currently available in Navajo Mountain, which allows students to earn college credits or attend community college in Kayenta, Tuba City or Page. Bill Gates has also set up a program to provide computers to members of this chapter. A satellite community college is wanted in Navajo Mountain. Community leaders would like for more young people to stay in or return to the area, but because of the distance to the surrounding towns, most leave the chapter as soon as they are able to.

Community

Navajo Mountain Chapter House
The Navajo Mountain Chapter House was built in 1960 with general funds from the Navajo Nation, in order to serve as a general meeting area for the local people. The Chapter House stands on 3.42 acres. Prior to the construction of the Chapter House, meetings were held in the classrooms at the Old BIA school directly northeast, when classes were not in session. Since the building of the Chapter House, meetings are held twice a month. The Chapter members are in need of a new Chapter House to accommodate offices, meeting rooms, and other community facilities.
Navajo Mountain Assembly of God Church – Rainbow City, Utah

Navajo Mountain Alliance Church (Mission)
The Navajo Mountain Alliance Church was the first established church within the Navajo Mountain community by the Missionaries of the Christian & Missionary Alliance Organization with Headquarters in New York. The first Missionaries were Glen and Louise Hurd, sent to Navajo Mountain in the early 1950’s. In the early 1960’s the church was built at the present location along N-16. It has a congregation of about 75 members. The church’s land consists of 4.5 Acres with one church building, one educational building, two houses and one mechanic building. These were built with Alliance funds utilizing local congregations.

Navajo Mountain Community Warehouse – Arizona
The Navajo Mountain community warehouse was established in the 1960’s by the Navajo Mountain Chapter to accommodate the local community members. The warehouse is used to store hay and other livestock products. Later in the same year two office buildings were built, one as an office and the other as an Arts and Craft building. The land, consisting of about two acres, was just picked and building began. The chapter has additional plans for this property in the future. The Navajo Engineer and Construction Authority (NECA) is presently using the area for their buildings (Office trailers) and equipment storage. NECA is the company doing the road construction into Navajo Mountain community. They will continue to use the space until the road is fully completed. The Navajo Mountain Chapter is also using the present building as offices, as well as the Naa Tsis Aan Community Land Use Planning Committee (NCLUPC). During the County and Federal Elections, the building is used as the Coconino County Election Precinct. Other meetings are conducted weekly here for the NECA and Roads.

Community Warehouse – Utah
Another warehouse was constructed in the Utah portion of the community to serve the people residing to the north of the Chapter House. The land was not withdrawn but is estimated to be one acre. It is used for storing hay and grain. Other purposes are decided at the chapter meetings. Along side the warehouse is the Adult Learning Center, which is presently being used as an office area for the New Mexico Water Association. Another section is proposed to be leased to the Navajo Nation TANF program as a sub-office.

Community Landing Strip (Dirt)
The Navajo Mountain community has a landing strip near the Utah State line south of the Chapter House. The airstrip was established in the late 1950’s to accommodate the Bureau of Indian Affairs Boarding School, Health Services, local government and the local businesses. It is primarily used for delivery and transport of services into and out of the community. The San Juan County Roads Department maintains the strip at the present time with grading services. It is the wishes of the local people to upgrade the landing strip so that better services can be provided. Proper development for all-weather service with night-lights would be sufficient for emergency services where there may be life-threatening situations.

The Navajo Nation Department of Transportation Aviation Program how has the landing strip on a national priority list for upgrade, hopefully to coincide with the construction of the N-16 highway. The upgrade will accommodate tour flights into the community from nearby major airports, including Page, Flagstaff, Grand Canyon, St. George, Las Vegas, and Farmington.
Navajo Mountain Health Center (Clinic)

The Utah Navajo Development Council, when it was still in existence in the 1960's, built the Navajo Mountain Health Center to provide health services to the Navajo people. In those days, the nearest Health facilities were located in Tuba City, Kayenta and Monument Valley. A Nurse Practitioner was stationed at the clinic to provide services five days a week and a regular Doctor would fly in on one day a week. The clinic sits on a land that is not properly withdrawn but is estimated to be about two acres. The community is working on a new facility to replace the current clinic. It is proposed that the Utah Navajo Health Care Systems administer the clinic.

At present, the health services available to the people include the Indian Health Services under the Kayenta Service Unit. There are two clinics under this Service Unit, the Kayenta Clinic and Inscription House Clinic. The Navajo Mountain Clinic is under the Inscription House Clinic. The Service Unit has its own Health Advisory Board comprised of eight Representatives from the District Two and District Eight Chapters.

Today the Navajo Mountain Clinic is open two days a week, on Monday and Thursday. The staff drives in from the Inscription House Health Center, usually a Doctor and some nurses. The clinic is closed on holidays.

To get Emergency services to Navajo Mountain takes anywhere from three to five hours, depending upon the location and the weather. Snow gets from one to three feet deep in severe weather and IHIS/PHS Ambulances or emergency drivers may not be accustomed to the inclement weather.

Navajo Mountain Social Service Building

The Navajo Nation and its Division is in the process of decentralizing some of its services either to the Agency level or to the Chapter level. Since the Navajo Mountain community is isolated from the other Navajo Nation communities, people have to travel great distance to obtain services. This includes Social Services, which is either located at Tuba City Agency Social Services or the Kaibeto Social Services Sub-office that serves the Navajo Mountain area. Social Service Programs include General Assistance, Adult In-Home Care Services, Child Protective Services, Heating Program, Emergency and Burial Services.

The only program that has brought its services to the Chapter is the Child Protective Services. A trailer office has been brought in to accommodate this individual staff member. At the present time the trailer is situated on the Chapter House land with an estimated one acre located directly north of Chapter House. Other personnel will be establishing offices for the people when additional office space is available.

Navajo Mountain Senior Citizen Center

Through the Navajo Nation Area Agency on Aging, the Navajo Mountain Chapter established the Senior Citizen Center. The Center was built with funds from the Navajo Nation Capital Improvement Project and San Juan County. Another portion of the center (office addition) should be built in the summer of 2002. The operation of the center began in the late 1960's through the VISTA Corp and eventually was run through the ONEO of the Navajo Nation.

The Center provides services to the elderly with congregate meals and meals on wheels for home bound clients. They also provide In-home care services and Transportation. The center has three full-time staff and three part-time in-home care workers. Each day different areas are served, and they operate on a five-day a week service. The center sits on a one-acre lot north of the Chapter House.
Land Suitability Analysis

The information contained in this section portrays characteristics of the land of the chapter in order to identify appropriate areas for development. Some of these characteristics could pose limitations for potential development and may even eliminate certain areas for use. Areas for development should be examined in terms of these characteristics before they are designated.
SITE

GROUNDS AND SURFACE WATER
Surface Water Two streams running northeast through property
Aquifer Bidahochi Aquifer, Mancos Shale Geologic Formation

SOILS INFORMATION
Soil Type A coarse, moderately permeable, sandstone soil
Precipitation 10"-20" of precipitation annually
Elevation 6380' to 6410' elevation
Vegetation Supports grassland vegetation

SLOPES AND TOPOGRAPHY
Slope This site is located on gentle slopes of 1% to 3% over the entire site. Two-thirds of the south site is on 1% or less.

VEGETATION AND WILDLIFE
Forest Cover Type Juniper Pinyon
Crown Density 0% - 25%
Endangered Species No known habitats

CULTURALLY SIGNIFICANT AREAS
None

TRADITIONALLY SENSITIVE AREAS
None

ENVIRONMENTALLY SENSITIVE AREAS
None

ACCESSIBILITY
Roads Major road along N.E. side of site to the N.W. and S.E. minor (dirt) roads throughout area.

POTENTIAL LIMITATIONS
No major limitations

SUITABLE FOR DEVELOPMENT
Yes

CONCLUSION
This area is suitable for a small, self-sustainable community. Residential and small commercial development would be appropriate land uses for this area along the newly developing transportation route. Refer to the suitability matrix (3-1) for a more specific analysis of the relationship between land use and biophysical factors.
### SUITABILITY MATRIX

#### NAVAJO MOUNTAIN

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● = Primary Relationship  
○ = Secondary Relationship  
● = Unsuitable
Old Windmill Suitability Analysis

SITE

GROUNDS AND SURFACE WATER
Surface Water  One main stream flowing from South to North.
Aquifer  Mancos Shale geologic formation in the “D” Aquifer.

SOILS INFORMATION
Soil Type  A coarse, moderately permeable, sandstone soil
Precipitation  8”-12” of precipitation annually
Elevation  6030’ to 6060’ elevation
Vegetation  Supports grassland vegetation

SLOPES AND TOPOGRAPHY
Slope  This site has maximum of 3% slope in the Southeast turning into less than 1% going Northeast.

VEGETATION AND WILDLIFE
Forest Cover Type  Non-Forest
Crown Density  0% - 25%
Endangered Species  No known habitats

CULTURALLY SIGNIFICANT AREAS
None

TRADITIONALLY SENSITIVE AREAS
None

ENVIRONMENTALLY SENSITIVE AREAS
None

ACCESSIBILITY
Roads  One major road running Northwest to Southeast with several minor roads intersecting in the middle of town.

POTENTIAL LIMITATIONS
No major limitations

SUITABLE FOR DEVELOPMENT
Yes

CONCLUSION
This area is also suitable for a self-contained mixed-use community. Substantial commercial development could be accommodated with new wastewater treatment plant. A balance between open space and development will provide for a promising community and prominent destination. Refer to the suitability matrix (3-1) for a more specific analysis of the relationship between land use and biophysical factors.
SITE
Acreage 200 acres

GROUND AND SURFACE WATER
Surface water One stream running East through property, one stream to the South running East
Aquifer Sandstone geologic formation in the "D" Aquifer

SOILS INFORMATION
Soil type Rough, broken or sandy land, interbedded sandstone and shale
Precipitation 8-12" precipitation annually
Elevation 5500' to 6400' in elevation
Vegetation Supports grassland vegetation

SLOPES AND TOPOGRAPHY
Slope The North part of this site has a moderate to heavy slope of 7 to 15% while the majority of the site sits on a gentle 1 to 3% slope going East.

VEGETATION AND WILDLIFE
Forest Cover Type Juniper
Crown Density 0 – 25%
Endangered Species No known habitats

CULTURALLY SIGNIFICANT AREAS
None

TRADITIONALLY SENSITIVE AREAS
None

ENVIRONMENTALLY SENSITIVE AREAS
None

ACCESSIBILITY
Roads One road running East-West through property, one road running North-South at west edge

POTENTIAL LIMITATIONS
Soil type could require extra structural stability

SUITABLE FOR DEVELOPMENT
Yes

CONCLUSION
This area is suitable for a residential development containing single-family lots, medium density residential and a small amount of commercial development. Refer to the suitability matrix (3-1) for a more specific analysis of the relationship between land use and biophysical factors.
Piute Mesa Suitability Analysis

SITE
Acreage 318 acres

GROUND AND SURFACE WATER
Surface Water One main stream flowing from South to North with several tributaries in the South.
Aquifer Dakota sandstone geologic formation in the “D” aquifer

SOILS INFORMATION
Soil Type Rough, broken or stony land, interbedded sandstone and shale
Precipitation 5"-8" of precipitation annually
Elevation 5870' to 5999' elevation
Vegetation Supports semi-desert grassland vegetation

SLOPES AND TOPOGRAPHY
Slope The West side of these this site has moderate slopes of 5% to 10%, while the main part of the site is on a gentle 3% to 5%, sloping North.

VEGETATION AND WILDLIFE
Forest Cover Type N/A
Crown Density N/A
Endangered Species No known species

CULTURALLY SIGNIFICANT AREAS
None

TRADITIONALLY SENSITIVE AREAS
None

ENVIRONMENTALLY SENSITIVE AREAS
None

ACCESSIBILITY
Roads Two major roads, one running North to South and one running Southeast to Northeast. There are several minor roads in the Northwest sections.

POTENTIAL LIMITATIONS
Soil type could require extra structural stability

SUITABLE FOR DEVELOPMENT
Yes

CONCLUSION
This area is suitable for residential developments that promote family farming and neighborhood interaction while respecting open space. Refer to the suitability matrix (3-1) for a more specific analysis of the relationship between land use and biophysical factors.
Resort Golf Course Suitability Analysis

SITE
Acreage 192 acres

GROUND AND SURFACE WATER
Surface Water Two main streams- one to the East and the other to the West. There is a lake to the Northwest.
Aquifer Cow Springs sandstone in the “D” aquifer

SOILS INFORMATION
Soil Type Gullied land sandstone
Precipitation 5"-8" of precipitation annually
Elevation 5203’ to 5800’ elevation
Vegetation Supports semi-desert grassland vegetation

SLOPES AND TOPOGRAPHY
Slope With bluffs on the East and West side and the low to moderate slopes from 1% to 20% going North to Southeast. This site it will make for a challenging and picturesque golf course.

VEGETATION AND WILDLIFE
Forest Cover Type Non - Forest
Crown Density 0% - 25%
Endangered Species No known habitats

CULTURALLY SIGNIFICANT AREAS
None

TRADITIONALLY SENSITIVE AREAS
None

ENVIRONMENTALLY SENSITIVE AREAS
None

ACCESSIBILITY
Roads Two minor roads Southeast of site.

POTENTIAL LIMITATIONS
No major limitations

SUITABLE FOR DEVELOPMENT
Yes

CONCLUSION
This narrow plateau that overlooks Lake Powell will be a challenging site, but an outstanding opportunity for resort and golf course development. The proposed resort and golf course could draw tourism to the Navajo Mountain chapter that would boost the economy in the area. Infrastructure would be packaged for self-containment and the golf course could be “target” type. There is an existing dirt road that can be paved and used as the primary vehicular route to the site.
The Navajo Mountain chapter is composed of mountainous terrain with Lake Powell flowing along the entire northern boundary and Navajo Mountain located in the center. Almost all drainage in the area flows towards Lake Powell, with two washes extending almost entirely across the chapter. There is one small area near the southern central boundary that drains to the south.

Water is scarce and stream flow is generally intermittent. Some water is stored in reservoirs. Ground water from deep wells is costly to develop. Water from shallow wells is variable in quantity and usually high in salts.

**Hydrogeology**

The Navajo Mountain chapter is located in the Kaiparowits hydrologic basin, adjacent to the Henry hydrologic basin. Regional groundwater in the Kaiparowits Basin flows to the northeast toward the Colorado River and Lake Powell; however, this regional flow pattern is modified in the Navajo Mountain area by the domal structure of Navajo Mountain and the nearby deep canyons. Navajo Mountain is a leucolithic igneous intrusion that has domed the surrounding sedimentary rock upward, resulting in radial surface water and groundwater flow patterns away from the mountain in all directions. Precipitation on Navajo Mountain itself provides recharge to aquifers in the vicinity.

**Groundwater**

Groundwater in the area is present in springs on Navajo Mountain, where it is collected in bedrock fractures and emerges in the alluvium and colluvium on the face of the mountain. Shallow water wells are used at the Navajo Mountain Chapter House area, which uses alluvium to collect water in a natural drainage. Attempts have been made to drill vertical wells in the vicinity of Navajo Mountain into the DeChelly sandstone aquifer. Two wells (2000 and 2300 feet deep) were drilled by I.H.S. on the south side of Navajo Mountain near Endischee Spring, but they did not reach the DeChelly sandstone aquifer. All of these deep wells have not been productive. Productive water wells, however, can be found at Inscription House and Flute Mesa, which are a considerable distance away.
Surface Water
The only surface water in the area of any significance is Lake Powell.

Spring and Water Source
Springs and water sources identified with the Arizona (southern) portion of the community are not developed and are only fixed for livestock. The Navajo Nation Water Maintenance Department of the Western Navajo Agency maintains the system, however, the Indian Health Services has established three watering points. The watering points are not a treated system.

1. Endlschee Spring is a source from the mountain. In the early 1960's, local manpower and local funds matched the CCC funds were use to bring the system from the mountain. The source is meant to be for livestock use only, and there are two watering points on the system. These are not operable today. At the time, livestock owners drove their herds to these points. Today, with modern transportation, people haul water to their home. These lines need repair if they are to continue serving the people. Lines of an inch and quarter (1¼") are used. The spring does not produce enough gallons per minute according to the I.H.S. and runs low during dry seasons even though it is continuously flowing.

2. Rainbow Lodge Spring is a source that was once used to service the Old Rainbow Lodge Trading Post (not standing today) and the lodges in the 1950's, and through community efforts the spring was developed again with CCC funds, Revenue Sharing Funds and local manpower. The spring is capped, however, and the source is not treated. The source is considered a livestock source and also does not yield enough even though it flows year round.

3. Piute Springs is an open source yielding adequate amount but it is not being developed. Presently, it is used for the farmlands in the upper Piute Canyon area. Funds will be needed to properly develop this source. The location is within the Navajo County portion of the community.

4. There are several sources (open and undeveloped) within the Navajo Canyon area (extreme south) of the community. This is the canyon running between District Two and District One of the Navajo Nation. Each of these sources empties into the Lake Powell. Farming and livestock are the primary users. These sources are located in the Navajo and Coconino counties.

5. Tse Yah Toh Spring is a source with water dripping from beneath the rock bed. It is open and subject to contamination. This source yields very little. It goes dry in the summer and is an unreliable source. It yields enough for a small amount livestock.

6. Fuller Spring on Piute Mesa. This is capped and has a small tank and watering point where residents fill water barrels.

7. Desha Canyon Spring is an open source that flows freely down Desha Canyon into Lake Powell. Its only use now is for small farming plots. If developed it can become another major source for the Rainbow City Development Area.

8. Beaver Spring serves Rainbow City and two schools. It is developed and treated.
Soils
Soils range from steep very shallow to deep and are fine to moderately coarse in texture. These soils are formed from sandstone, siltstone, claystone, basalt, and limestone parent materials. These soils are often calcareous and generally high in salts. Deep, fine-to-medium textured soils are in the depressions and along the drainageways. Rock outcrops are common along escarpments and on the steep slopes of the mesas.

Geomorphology
This area is in the Colorado Plateau’s physiographic province. Geomorphic processes active in this area are deep canyon formations as the result of plateau dissections. Major land forms are canyon lands, plateaus, plains, mountains and hills. Navajo Mountain is a laccolithic dome formed by the intrusion of igneous rock.

Generalized Stratigraphic column for the Navajo Mountain/Rainbow Village Area

<table>
<thead>
<tr>
<th>System/Group</th>
<th>Geologic Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurassic</td>
<td>Glen Canyon Group</td>
</tr>
<tr>
<td>Triassic</td>
<td>Glen Canyon Group</td>
</tr>
<tr>
<td>Triassic</td>
<td>Glen Canyon Group</td>
</tr>
<tr>
<td>Triassic</td>
<td>Glen Canyon Group</td>
</tr>
<tr>
<td>Permian</td>
<td>Glen Canyon Group</td>
</tr>
<tr>
<td></td>
<td>Navajo Sandstone</td>
</tr>
<tr>
<td></td>
<td>Kayenta Formation, Wingate Sandstone</td>
</tr>
<tr>
<td></td>
<td>Chinle Formation</td>
</tr>
<tr>
<td></td>
<td>Moenkopi Formation</td>
</tr>
<tr>
<td></td>
<td>Cutler Formation</td>
</tr>
</tbody>
</table>
Stratigraphy and Aquifers of Navajo Lands

The Stratigraphy and Aquifers chart is useful in providing valuable information about the origins, composition, distribution and succession of the rock strata of the chapters of the Navajo Nation as well as underground hydrology. The geologic features of the area were formed during the Quaternary, Tertiary, Cretaceous, Jurassic, Triassic and Permian periods of the Cenozoic, Mesozoic, and Paleozoic eras approximately 70,000,000 to 230,000,000 years ago.

These geologic formations are mainly made up of sandstone, shale, and limestone rock. The formations were formed when detrital or loosened materials were deposited and compressed to form rock. The sandstone layers include the Dakota, Cow Springs, Navajo, Wingate, and Coconino formations. Sandstone is created when layers of sand are compressed into stone. Shale formations include the Mancos formation. Shale is formed when clay or silt particles are compressed into stone. The Kaibab formation is the only limestone formation. It was formed by the compression of layers of tiny plankton and other microscopic creatures. Other formations are made up of mixtures of sandstone, shale, and limestone, as well as other washed in materials. The Alluvium formation layer is made up of a mixture of clay, silt, sand, gravel and other similar materials.

Aquifers are sheet-like masses or layers of water that permeate through certain rock formations within the Navajo region. Major aquifers are identified as the Bidahochi Aquifer within the Bidahochi and Mesa Verde Group formations, the D Aquifer within the Dakota Sandstone, Morrison Foundation, Cow Springs Sandstone and Entrada Formation, the N Aquifer within the Navajo Sandstone, Kayenta, and Wingate Sandstone formations, and the C Aquifer located within the Shinarump Conglomerate, Moenkopi, Kaibab Limestone, and Coconino Sandstone formations. No major aquifers are located within the Alluvium, Mancos Shale, Carmel, or Chinle formations.

The above illustration shows the variation of rock formations determined by altitude. Knowing that the majority of the Navajo Mountain chapter is located between 4,500 and 7,000 feet above sea level, we see that there are a variety of geologic formations and aquifers throughout the chapter.
<table>
<thead>
<tr>
<th>Soil code</th>
<th>Texture</th>
<th>Depth</th>
<th>Permeability</th>
<th>Parent Material</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>34RM-1</td>
<td>Coarse</td>
<td>10-20&quot;</td>
<td>Moderately permeable</td>
<td>Sandstone</td>
<td>1</td>
</tr>
<tr>
<td>10Q-1</td>
<td>Coarse</td>
<td>36&quot;+</td>
<td>Moderately permeable</td>
<td>Sandy wind blown or reworked material</td>
<td>1</td>
</tr>
<tr>
<td>46M-1</td>
<td>Gullicd land</td>
<td></td>
<td></td>
<td>Sandstone</td>
<td>1</td>
</tr>
<tr>
<td>43EM-3</td>
<td>Rough, broken or stony land</td>
<td>36&quot;+</td>
<td>Moderately permeable</td>
<td>Interbedded sandstone and shale</td>
<td>3</td>
</tr>
<tr>
<td>34RM-2</td>
<td>Coarse</td>
<td>10-20&quot;</td>
<td>Moderately permeable</td>
<td>Sandstone</td>
<td>2</td>
</tr>
<tr>
<td>46M-2</td>
<td>Badlands</td>
<td></td>
<td></td>
<td>Sandstone</td>
<td>2</td>
</tr>
<tr>
<td>34RM-2</td>
<td>Coarse</td>
<td>10-20&quot;</td>
<td>Moderately permeable</td>
<td>Sandstone</td>
<td>2</td>
</tr>
<tr>
<td>46M-2</td>
<td>Gullicd land</td>
<td></td>
<td></td>
<td>Sandstone</td>
<td>2</td>
</tr>
<tr>
<td>22RM-1</td>
<td>Coarse</td>
<td>20-36&quot;</td>
<td>Moderately permeable</td>
<td>Sandstone</td>
<td>1</td>
</tr>
<tr>
<td>10Q-2</td>
<td>Coarse</td>
<td>36&quot;+</td>
<td>Moderately permeable</td>
<td>Sandy wind blown or reworked material</td>
<td>2</td>
</tr>
<tr>
<td>11Q-1</td>
<td>Coarse</td>
<td>36&quot;+</td>
<td>Rapidly permeable</td>
<td>Sandy wind blown or reworked material</td>
<td>1</td>
</tr>
<tr>
<td>43EM-2</td>
<td>Rough, broken or stony land</td>
<td></td>
<td></td>
<td>Interbedded sandstone and shale</td>
<td>2</td>
</tr>
<tr>
<td>46EM-1</td>
<td>Gullicd land</td>
<td></td>
<td></td>
<td>Sandstone</td>
<td>1</td>
</tr>
<tr>
<td>43EM-1</td>
<td>Rough, broken or stony land</td>
<td></td>
<td></td>
<td>Interbedded sandstone and shale</td>
<td>1</td>
</tr>
<tr>
<td>34RM-3</td>
<td>Coarse</td>
<td>10-20&quot;</td>
<td>Moderately permeable</td>
<td>Sandstone</td>
<td>3</td>
</tr>
</tbody>
</table>

Zone 1 receives 5"-8" of precipitation annually, is less than 5500' in elevation and supports semi-desert grassland vegetation. Zone 2 receives 8"-12" of precipitation annually is between 5500' and 6400' in elevation and supports grassland vegetation. Zone 3 receives 12"-14" annually, is between 6200' and 7400' in elevation and supports sagebrush grassland vegetation.
Physical Features
The Navajo Mountain community, located within one of the most remote regions of the Navajo Reservation, adjoins a large area of deep, straight-walled canyons and bare convoluted sandstone. Many mesas, buttes, and rock pillars rise perpendicularly from an otherwise gently rolling broad plain. This area attracts thousands of visitors every year. The majority of the chapter area drains into Lake Powell or the San Juan River through several existing canyons and washes. Navajo Mountain, the highest peak, is 10,388 feet above sea level and is the area's most prominent feature. Most of the area is formed of high plateaus almost a mile above sea level.

Elevation and Topography
Elevation varies from 4,500 to 7,000 feet over most of the area with the peak of Navajo Mountain, 10,388 feet, being the highest point. The lowest point of the area is Lake Powell with a spillway elevation of 3,648 feet. Gently sloping plateaus and mesas are deeply and abruptly cut by canyons. Stream valleys are widely spaced and have narrow floors. Dunes of wind-worked materials are found locally.
The Navajo Nation receives federal funding from various agencies; therefore development must be compliant with a variety of federal laws and regulations. It is the responsibility of the Navajo Nation Chapters to uphold certain legislative mandates such as the Navajo Nation Code (Titles 17 and 23), the Endangered Species Act, the National Environmental Policy Act, Lacey Act and Airborne Hunting Act and others related to wildlife. The Comprehensive Land Use Plan must give attention to all aspects of the future, including issues of wildlife and natural resources.

Wildlife and plants are an essential part of Navajo history and tradition, especially for Navajo elders and medicine people. Many native plants are used in Navajo ceremonies. There are mountains, natural springs, birds, wildlife and plants that are considered sacred by the Navajo people and require preservation.

The Navajo Nation Department of Fish and Wildlife was established “to conserve, protect, enhance and restore the Navajo Nation’s fish, wildlife, plants and their habitat, through aggressive management programs for the spiritual, cultural and material benefit of present and future generations of the Navajo Nation.” The involvement of the NNDFWL in the planning process is essential to help guide local chapters and communities through meeting federal and Navajo Nation laws. The NNDFWL has identified three key steps in the process:

**Identification of species**
The NNDFWL is compiling information about wildlife issues that will be available to the chapters upon request for land use planning. This information includes animal and plant species of concern, habitat of concern, management areas, laws and regulations. Biological surveys have not been conducted on all areas of the Navajo Nation, so the Department has limited information on the location of most species. It does, however, have complete information about the potential range and habitat requirements for these species.

**Identification of areas of concern**
The department has some general information concerning sensitive areas including:

- Wetlands (meadow, streams, lakes, springs)
- Vital big game habitat (deer winter habitat range, fawning areas, turkey roosts)
- Rare and endangered species habitat (raptor nesting sites)
- Recreational areas (hiking, fishing, boating areas)
- Habitat enhancement projects (water catchments, tree thinning)
- Refuge (Red Lake, Hugo Meadows)
- Special management areas (trophy units, areas identified in forest management plans)

**Coordination with Department of Fish and Wildlife**
The Committee for Land Use Planning (CLUP) and their consultant should contact the NNDFWL as early as possible in the process to request information about existing species and areas of concern.

Reference:
**Chapter Guide for Wildlife in Land Use Planning for Local Governance Act Initiative**
Navajo Nation Department of Fish and Wildlife
PO Box 1480
Window Rock, AZ 86515
(520) 871-6431/7598
The Navajo Nation Department of Fish and Wildlife (NNDFWL) released the following list of endangered species in March 2001 as Resources Committee Resolution No. RCMA-31-01. According to 17 NNC 507A it is unlawful for anyone to “take, possess, transport, export, process, sell or offer for sale or ship any species or subspecies” on the Navajo Endangered Species List, punishable by imprisonment and/or a fine. The NNDFWL determined the appropriate group listing based upon the following factors:

- Present or threatened destruction, modification, or curtailment of its habitat
- Over-utilization for commercial, sporting or scientific purposes
- Effects of disease or predation
- Other natural or man-made factors affecting its prospects of survival or recruitment
- Any combination of the foregoing factors

**GROUP 1**

**SPECIES OR SUBSPECIES THAT NO LONGER OCCUR ON THE NAVAJO NATION**

**MAMMALS**

- *Canis lupus* (Gray Wolf)
- *Lontra canadensis* (Northern River Otter)
- *Ursus arctos* (Grizzly or Brown Bear)

**BIRDS**

- *Centrocercus minimus* (Gunnison Sage Grouse)

**FISHES**

- *Gila elegans* (Bonytail)

**GROUP 2**

**SPECIES OR SUBSPECIES WHOSE PROSPECTS OF SURVIVAL OR RECRUITMENT ARE IN JEOPARDY**

**MAMMALS**

- *Mustela nigripes* (Black-footed Ferret)

**BIRDS**

- *Empidonax traillii extimus* (Southwestern Willow Flycatcher)

**AMPHIBIANS**

- *Rana pipiens* (Northern Leopard Frog)

**FISHES**

- *Gila cypha* (Humpback Chub)
- *Gila robusta* (Roundtail Chub)
- *Psychocheilus lucius* (Colorado Pikeminnow)
- *Xyrauchen texanus* (Razorback Sucker)

**PLANTS**

- *Astragalus humillimus* (Mancos Milk-vetch)
- *Erigeron rhizomatus* (Rhizome Fleabane)
- *Pediocactus bradyi* (Brady Pincusion Cactus)
GROUP 3
Species or subspecies whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

MAMMALS
*Ovis canadensis* (Bighorn Sheep)

BIRDS
*Accipiter gentilis* (Northern Goshawk)
*Falco peregrinus* (Peregrine Falcon)

INVERTEBRATES
*Speyeria nokomis* (Western Seep Fritillary)

PLANTS
*Allium gooddingii* (Gooding’s Onion)
*Astragalus crennaphylax var. heyronii* (Marble Canyon Milk-vetch)

GROUP 4
Species or subspecies for which the NNDFWL does not currently have sufficient information to support their being listed in group 2 or 3 but has reason to consider them. The NNDFWL will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list.

MAMMALS
*Dipodomys microps* (Chisel-toothed Kangaroo Rat)
*Microtus mexicanus* [mogollonensis] (Navajo Mountain Vole)

BIRDS
*Empidonax hammondii* (Hammond’s Flycatcher)
*Picoidea tridactylus* (Three-toed Woodpecker)

REPTILES
*Lampropeltis triungulum* (Milk Snake)
*Sauromalus ater* (Chuckwalla)
FISHES  
*Catastomus discobolus* (Bluehead Sucker)  
*Coitius bairdi* (Mottled Sculpin)

INVERTEBRATES  
*Oxylosma kanabense* (Kanab Ambersnail)

PLANTS  
*Ansonia peeblesi* (Peebles Blue-star)  
*Asclepias sanjuanensis* (San Juan Milkweed)  
*Asclepias welshei* (Welsh’s Milkweed)  
*Astragalus cronquistii* (Cronquist Milk-vetch)  
*Astragalus naturitensis* (Naturita Milk-vetch)  
*Astragalus sophoroides* (Painted Desert Milk-vetch)  
*Astragalus tortipes* (Sleeping Ute Milk-vetch)  
*Camissonia arwoodii* (Atwood’s Camissonia)  
*Clematis hirsutissima* var. *arizonica* (Arizona Leather Flower)  
*Cryptantha arwoodii* (Atwood’s Catseye)  
*Cymopterus acaulis* var. *higginsii* (Higgins Biscuitroot)  
*Cystopteris utahensis* (Utah Bladder-fern)  
*Erigeron sivinskii* (Sivinski’s Fleabane)  
*Erratricia rundata* (Round Dunebroom)  
*Lesquerella navajoensis* (Navajo Bladderpod)  
*Perityle specicola* (Alcove Rock Daisy)  
*Phacelia indecora* (Bluff Phacelia)  
*Phacelia welshei* (Welsh Phacelia)  
*Puccinellia parishii* (Parish’s Alkali Grass)

There are no known endangered species habitats in the developed area of the Kayenta chapter, however, each individual site should be investigated before any site development is begun.

Natural Vegetation
Vegetation in most of the Navajo Mountain area consists of pinyon-juniper woodlands at higher elevations, grama and galleta grasses at lower elevations; greasewood and saltbrush on calcareous and salt affected soils. Pine, fir and aspen are also present at the higher elevations on Navajo Mountain.

Much of the land has an open grass-shrub cover of Big Sagebrush (*Artemisia tridentata*), Black Brush (*Coleogyne ramossissima*), Mormon Tea (*Ephedra sp.*), Galleta (*Hilaria jamesii*), Blue Grama grass (*Bouteloua gracilis*), Western Wheatgrass (*Agropyron smithii*), Indian Ricegrass (*Oryzopsis hymenoides*), and Needlegrass species (*Stipa sp.*). In the Rainbow Bridge and Lake Powell area, there are thin poor soils that receive barely 7 inches of rain per year. Over 750 species of plants live in the area, including blackbrush, saltbrush, sand sage, yucca, Mormon tea, tumbleweed and tamarisk. Bridge Canyon is shaded and moister, and sacred datura, oak, juniper, redbud, and buffaloberry grow there.

Navajo Nation Department of Fish & Wildlife
Chapter Land-Use Planning Zones
The Navajo Nation Department of Fish and Wildlife (NNDFWL) is in the process of designating all the reservation land as one of the following zones. These zones are defined by various levels of sensitivity to be employed in development based on the location of endangered species and their habitats.

Zone 1 (Highly Sensitive/Restricted Development): This zone contains the best habitat for endangered, rare and sensitive plant, animal and game species, and the highest concentration of these species on the Navajo Nation. To protect the Navajo Nation’s most sensitive habitats for plants and animals the NNDFWL advises no further business or residential development, permanent, temporary or seasonal. Exceptions are not of concern if a biological evaluation determines the proposed development is within or adjacent to an area already developed and not close enough to habitat to cause long-term impacts. “Adjacency” will depend on the species and situation, but generally means within 1/8 mile. Any proposed development in Zone 1 shall be submitted to the NNDFWL for review and comment. The NNDFWL will
evaluate each proposed project for appropriate environmental impact. The NNDFWL has the authority to reject any project in its entirety or approve with conditions.

Zone 2 (Med. Sensitive/Development with careful planning): This zone has a concentration of rare, endangered, sensitive and game species occurrences or has a high potential for these species to occur throughout the landscape. To minimize impacts on these species and their habitats and to ensure the habitats in Zone 1 do not become fragmented, the NNDFWL recommended that no development be placed in Zone 2 to avoid species and their habitat. Avoidance needs to include an adequate buffer to address long-term impacts. The buffer distance will depend on the species and the situation, and may be up to one mile. As with Zone 1, any proposed development in Zone 2 shall be submitted to the NNDFWL for review and comment. The NNDFWL will evaluate each proposed project for appropriate environmental impact. The NNDFWL has the authority to reject any project in its entirety or approve with conditions.

Zone 3 (Low Sensitivity): This zone has a low, fragmented or unknown concentration of species of concern. Species in this zone may be locally abundant on ‘islands’ of habitat, but islands are few and far between. Small-scale development to serve the needs of individual, such as homesties and utilities can proceed without concern for significant impacts to biological resources. Any development in this zone shall be provided to the NNDFWL for its files. No approval is required.

Community Zone: The NNDFWL has determined that areas around certain communities do not support the habitat for species of concern and therefore development can proceed without further biological evaluation. For certain communities, there are exceptions where one or two species have the potential to occur. For these exceptions, the biological evaluation need only address those species. Any development in this zone shall be provided to the NNDFWL for its files. No approval is required.

Habitat enhancement/refuge/preserve zones: These areas contain excellent, or potentially excellent, wildlife and/or plant habitat and are recommended by the NNDFWL for protection form most human-related activities. They will be identified for each chapter on a case-by-case basis. A variety of protection techniques are available, and the NNDFWL is interested in working with the chapter and land-user to protect/ enhance these habitats by providing technical assistance, and possibly materials and labor. The NNDFWL is also interested in receiving proposals from chapters and land-users for these types of zones.

The Navajo Nation Department of Fish and Wildlife is in the process of creating maps that locate these zones for all chapters on the Navajo Nation. Some of these maps have already been finished, and the others are being created as quickly as possible.
Culturally Significant Areas

Navajo Mountain and Oljato communities are blessed with vast natural wonders from Lake Powell, Rainbow Bridge, Navajo Mountain, canyons and mesas with enormous amount of Anazazi Ruins with the region.

The Navajos have regarded Rainbow Bridge, or Tse nani’ahi, as a sacred site for thousands of years. It was named a National Monument in 1910 and a National Parks Service General Management Plan was adopted in 1993 to mitigate visitor impacts and preserve the resources of the Monument. Rainbow Bridge is located in the Navajo Mountain Chapter and is accessible from Lake Powell or by two rugged trails that begin near Navajo Mountain. The natural arch is located at about 3,600 feet elevation and its footing is flanked by Lake Powell, which also attracts about 300,000 tourists a year. The Navajo frequent the Rainbow Bridge site to pray and set forth their offering of corn pollen and precious minerals to ask for appropriate blessings applicable to their endeavors.

Navajo Mountain, the namesake of the chapter, straddles the Utah-Arizona border, rising into the sky at 10,380 feet elevation. Its peak is the highest point on the Navajo Nation. It is known in Navajo as Nnatsis'aa'n, or "Head of the Earth Woman" and is one of the Navajo's sacred mountains. A radio tower has been built on top of Navajo Mountain near the sacred pool, in a location that was once used for ceremonies. Some Medicine People still visit the mountain to collect plants used in ceremonies and to make offerings of corn pollen and precious stones.

Before the construction of Glen Canyon Dam, Navajo chanters would make pilgrimages to Rainbow Bridge and the nearby convergence of the San Juan and Colorado rivers to perform ceremonies and bring offerings. The filling of the lake has since covered the convergence of the rivers and made access to Rainbow Bridge much easier.
Bureau of Indian Affairs
Established Road Numbers

The Bureau of Indian Affairs (BIA) Western Navajo Agency Roads Department is the primary road provider within the Navajo Mountain Community. San Juan County maintains the roads on the Utah portion of the community.

The main route into the community is the Navajo Route N-16, which is about fifty percent (50%) paved. Route N-16 will eventually be paved all the way to the Naa Tsis Aan Community School. The projection for completion is expected to be in 2004 if there is no redirection of funds.

The following is a list of the major and minor roads within the chapter, most of which are not paved, but have gravel or dirt surfaces.

N-16 Main Route – Primary connection to PHS, Agency, Stores and other places
N-161 Road leading to Rainbow Lodge area
6305 North of Rainbow City area
6310 Navajo Mountain (Rainbow City area), Piute Mesa to Shonto community
6315 To Lake Powell off 6310
6325 Paiute Mesa North off 6310
6306 Extension of 6325 to rim of north Piute Mesa
6320 Connection to Shonto off paved N-16
6321 Connection to SR-564 and to US-160
The infrastructure Analysis provides further information on which to base the decisions for the best possible areas to develop and any major infrastructure projects that would need to be completed before development can begin.
### WATER
Yes
A water main runs through the site parallel to the road. This line could be tapped to serve the new development.

### SEWER
None
Would need its own sewer lagoon

### ELECTRICITY
Yes
There is an electric line that serves residents near here. This line could be tapped in order to serve the new development.

### GAS
None
Some residents use propane tanks

### COMMUNICATION
None

### RELATIONSHIP TO EXISTING
The only direct relationship to any existing infrastructure is the adjacent water line, which could serve the development. See section 4-8 for a conceptual gauge of water units. We gravity fed the sewer to a new micro-sewage treatment plant.
Old Windmill Infrastructure Analysis Narrative

<table>
<thead>
<tr>
<th>Utility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>A water main runs through the site parallel to the road. This line could be tapped to serve the new development.</td>
</tr>
<tr>
<td>SEWER</td>
<td>Would need its own sewer lagoon</td>
</tr>
<tr>
<td>ELECTRICITY</td>
<td>There is an electric line that serves residents near here. This line could be tapped in order to serve the new development.</td>
</tr>
<tr>
<td>GAS</td>
<td>Some residents use propane tanks</td>
</tr>
</tbody>
</table>

**COMMUNICATION**
None

**RELATION TO EXISTING**
Water and electricity could be supplied to the development from adjacent utilities. See section 4-8 for conceptual water usage. For the proposed industrial park, a new substation would need to be established which in turn could accommodate the proposed commercial. Power trunk lines could easily feed to cul-de-sac streets with power. Sewer would be collected and be distributed to a new proposed community treatment facility.
IHS proposed water line location

old windmill
Deep Canyon Infrastructure Analysis Narrative

WATER
None
No water lines currently reach the site, but there are some mains in the town area. There is a possibility that they could be tapped to serve the new development.

SEWER
None
Would need its own sewer lagoon

ELECTRICITY
None
The residents in the town area are connected to the electric line. This line could extend to serve the new development.

GAS
None
Some residents use propane tanks

COMMUNICATION
None

RELATION TO EXISTING

The closest infrastructure, which could be utilized, would be the utilities to the west serving existing neighborhoods and schools. A community micro-treatment system would serve this development well. Utility trunk lines feed cul-de-sacs for efficiency. The overall water and sewer lines can be looped for repetitive serving in case of needed repair.
WATER
None
There is a fresh water spring in Piute Canyon. With the addition of a filtration system, the spring would make a good water source, but the steep slope up to the site could increase cost.

SEWER
None
Would need its own sewer lagoon

ELECTRICITY
None
Many homes have receptacles and lights but no connection. Many have been waiting for years. Some residents use generators.

GAS
None
Some residents use propane tanks

COMMUNICATION
None

RELATION TO EXISTING

This development must be thought of as an overall complex. Currently there are no utilities in the area. A new treatment system could serve the entire series of development while at the same time provide gray water irrigation for farming. As power arrives, solar energy or wind-generated power would be a solution.
WATER
None
This area is located very near Lake Powell. The lake would make a good water source, but the steep slope up to the site could increase cost.

SEWER
None
Would need its own sewer lagoon

ELECTRICITY
None

GAS
None

COMMUNICATION
None

RELATION TO EXISTING

This development is again isolated from any existing infrastructure. The site was chosen for its prominent view and location to Lake Powell. It is recommended that this resort would be a self-sustainable community, with its own water filtration plant, sewer treatment, and power generation. With the right design, this will be a world-class destination.
The Navajo people have always been very self-reliant and lived on very little. Studies showed that approximately 77 percent of Navajo homes lack plumbing, 72 percent lack adequate kitchen facilities, and 76 percent lack telephone services. Thirty-five percent of Navajo families must haul water from windmills or springs to meet their basic domestic water needs. Many of the present water systems were constructed prior to the Clean Water Act and therefore do not meet the strict standards set by the U.S. Environmental Protection Agency.

Water
The remoteness, ruggedness, limited access and hydrogeology of the area has always presented challenges for the Chapter’s communities to obtain a consistent and safe drinking water source. Water sources that have been developed include Beaver Springs, Endischee Springs, Haystack Springs, Tse-Ya-Toh Springs and shallow wells next to the Navajo Mountain Chapter House. Attempts have been made to use ground water in the area but these attempts have not produced significant water.

Water development within the Navajo Mountain community has been a big problem for any growth for community and economic development. The community chapter members had on numerous occasions requested for additional residential housing but had been denied on each request because of the insufficient water source to meet the need. One of the biggest problems concerning water is that the surface soaks up water quickly. Wells that are dug come up empty soon thereafter. There was an attempt to drill near Old Windmill but funding was lost because of political reasons. Drilling was completed to about 175 feet although 3000 feet was the goal.

The underground water level for Navajo Mountain community is low according to the Indian Health Services (I.H.S.) and obtaining water is costly. The Department of Water Resources, I.H.S. and the Bureau of Reclamation conducted a Feasibility study in the spring of 2000 for the possibility of securing water for the community. In this study, one plan was to run a transmission line from Inscription House community to Navajo Mountain and two plans to pump water from Lake Powell.

Navajo Mountain does not have running water throughout the community and the best potential source for running water will be from siphoning springs. The existing water pumps can be powered by using solar panels for an inexpensive year round fuel source. The addition of storage tanks in various areas will allow for a reservoir of water to be available when needed. The many springs in the area will work well to provide plenty of drinking water for Navajo Mountain residents. Possible water sources include Tall Mountain Spring, Piute Canyon or Lake Powell. The quality of water available from Piute Canyon is questionable so a filtration plant would probably be necessary. The water that is used currently comes from Navajo Mountain. The Deep Canyon area has an ample supply of water right now.

There are dividing boundaries within the chapter, both physical and political, which must be considered in addressing the issue of water supply. These boundaries will not allow water to be transferred from state to state or from county to county. There are also natural physical divisions, like mountains and ridges, which could also make transferal of water difficult.

The possibility has also been mentioned that one of the rivers could be dammed to form a lake. This would not only provide a source of water for public use, depending upon the size and location, could provide some amount of hydroelectric power. Pipelines will need to be placed in or near valleys to tap the water supply from local rivers to supply irrigation for the grasslands. The irrigation of grassland areas will allow for the renewal of natural vegetation, providing food for the grazing herds occupying the chapter and helping to control erosion.

The Inscription House was mentioned as a possible source for water, but it is outside the chapter. The chapter would need to investigate regulations concerning the crossing of chapter boundaries with utility lines. This would probably also require permission from the Inscription House Chapter.

The Bureau of Reclamation, Indian Health Services and the Department of Water Resources conducted a Feasibility Study for the Navajo Mountain Chapter Water System, completed March 2000. It investigated
the current status of three areas, Rainbow Village, Navajo Mountain Community, and Endishee Springs. An overview of this research is included here.

**Rainbow Village area**
All water originates from a single surface water source. The Tribal treatment system provides water to the 65 homes in the village and to watering points where water is collected and hauled to 36 additional homes. The BIA school treatment system serves the elementary and high school, estimated students 118. The 1998 calculated potable water demand estimate is 48,150 gallons per day or constant flow rate of 33 gallons per minute.

Beaver Springs is a natural spring located in Cha Canyon on the northeast side of Navajo Mountain, 5 miles west of Rainbow Village. The spring can be reached by a four wheel drive road up until the last mile, which must be traveled on foot. There are two collection wells, horizontal drilling to the east and west to increase production rates. Because so much surface water and stormwater drain into the wells, it is considered surface water. There are traces of wildlife and livestock around the surface drainage. In order to prevent contamination of Beaver Springs by surface water, a separate stock-watering site could be created and surface holes filled with a geomembrane.

Flash floods have exposed the pipe in many locations. Estimated flow is from 30 to 100 gpm. From Beaver Springs, it flows through a 36,000 gallon tank and a 212 gallon storage tank before chlorine and fluorine are added by the Tribal operated injection station. The water is then distributed to Rainbow Village. The BIA school further treats its water with a gas chlorination system and filtration system before it enters their 30,000 gallon tank. The filtration and chlorination systems in this area were determined to be inadequate, and should be moved to the front of the tank. Removal of surface flow would remove the need for a filtration system; otherwise a new filtration system is required.

<table>
<thead>
<tr>
<th>Adequate water production?</th>
<th>Produces 18700 gpd</th>
<th>required 16800 gpd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage for 5 days flow?</td>
<td>Available 16000 gal</td>
<td>required 25200 gal</td>
</tr>
<tr>
<td>Peak day storage (2x)?</td>
<td>Available 16000 gal</td>
<td>required 33600 gal</td>
</tr>
<tr>
<td>Meet Surface Water Treatment Rule?</td>
<td>No chlorination</td>
<td></td>
</tr>
</tbody>
</table>

**Navajo Mountain community**
The water system in the Navajo Mountain community area provides water to 5 homes, the chapter house, and watering points for 135 homes. The calculated demand on the system is 16,800 gallons per day or a 12 gpm constant rate. There are two sources: a 21 ft deep infiltration well yielding 5 gpm with a 6,000 gal storage tank and a 60 ft well yielding 8 gpm with a 10,000 gal tank. From this we see that the available storage is only 16,000 gallons, where the required storage is 32,440 gallons, and that this area needs a new well or potable water source. It has also been suggested to connect the two wells. The supply is currently unchlorinated, and it is not needed at each well head.

<table>
<thead>
<tr>
<th>Adequate water production?</th>
<th>Produces 30 to 100 gpm</th>
<th>1998 demand is 33 gpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage for 5 days flow?</td>
<td>Available 278000 gal</td>
<td>required 240750 gal</td>
</tr>
<tr>
<td>Peak day storage (2x)?</td>
<td>Available 278000 gal</td>
<td>required 96300 gal</td>
</tr>
<tr>
<td>Meet Surface Water Treatment Rule?</td>
<td>No filtration, inadequate chlorination</td>
<td></td>
</tr>
</tbody>
</table>

**Endishee Springs area**
Present water supplies are affected by droughts, reducing reliability to meet existing demands. Therefore, this area needs an additional source for times of drought. Peak demands are estimated at twice the average flow and are supplied by water contained in storage tanks. However, the storage is all open and there is a potential for contamination. In order to implement a central filtration and chlorination plant, covered tanks are required. Storage capacity data is not provided.
Recommendation to the Water User’s Association
In April of 2000, the Chapter acted on a Resolution to support the Alternative One Plan of the Feasibility Study conducted by the Bureau of Reclamation, Indian Health Services and the Department of Water Resources. Meetings need to continue with all the parties involved. The Water User’s Association should work closely with the Department of Water Resource and Indian Health Services and all the other appropriate programs to make this project a reality.

Environmental Protection Agency (E.P.A.)
There is an adequate amount of water for growth and development from the springs on the mountain and from the surrounding source, but the Navajo Nation Environmental Protection Agency Department has put a hold on any surface water developments. They will not allow anyone to use surface water due to the possibility for contamination. The water must be ground water in order for it to be filtered and treated. At the present time the source being used by residents and the School at the Rainbow City area has a treatment system.

In 1998 (the last year for which EPA has complete data), based on information reported to EPA by the states, 0.75 percent of all systems violated a treatment technique, 5 percent of all systems violated an MCL, and 17.6 percent of all systems had a reporting/monitoring violation.

Considerations for water services
Fire protection is usually the determining factor for most large development projects. In order for there to be adequate fire protection, the following three criteria should be met in any water piping system.
1. Minimum Static Pressure at the fire hydrants should be 35 psi.
2. Minimum “Fire-flow” Pressure should be 20 psi. This is the pressure available in the line if all fire hydrants where in.
3. A velocity in the water piping system should be a minimum of 2.5 fps.

When determining the material to be used in the water or sanitary piping systems, you should consider the following characteristics:

<table>
<thead>
<tr>
<th>Polyvinylchloride (PVC) piping</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>Details</td>
</tr>
<tr>
<td>When compared to ductile iron piping, PVC piping is considerably cheaper per linear foot ($10 vs $8) when used in large quantities. PVC’s lower Manning coefficient “n” (0.010 vs 0.012) means an increased capacity of the pipe.</td>
<td>Since the material of a PVC pipe is non-metallic, locator wire must be used on top of the pipe when laid so it may be found for future expansions. The weaker strength of the PVC pipe precludes the usage of the PVC pipe in sanitary or water pipes with a buried depth of eight (8’) feet. Under those circumstances, ductile iron pipe must be used to prevent crushing.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ductile Iron (DI) piping</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advantages</td>
<td>Details</td>
</tr>
<tr>
<td>Ductile iron piping has greater durability, strength, and flexural strength than PVC piping. Ductile iron piping needs no extra materials to be used in order for it to be found for future expansions.</td>
<td>The main disadvantage besides the cost disadvantage is that ductile iron piping has a tendency to corrode when used in corrosive or acidic soils. This can lead to expensive repair or rehabilitation costs.</td>
</tr>
</tbody>
</table>

When doing water demand estimations, sanitary sewer production numbers are considered to be 80% of the water demand in non-residential usages (church, schools, commercial, etc.). In the table below are the estimated gallons per day demand numbers for the different usages:
<table>
<thead>
<tr>
<th>Usage</th>
<th>Unit</th>
<th>Water Demand per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Church</td>
<td>Seat</td>
<td>10 gpd</td>
</tr>
<tr>
<td>Elementary School</td>
<td>Student</td>
<td>12.5 gpd</td>
</tr>
<tr>
<td>High School</td>
<td>Student</td>
<td>25 gpd</td>
</tr>
<tr>
<td>Commercial</td>
<td>Employee</td>
<td>100 gpd</td>
</tr>
<tr>
<td>Medium Density Residential</td>
<td>Apartment</td>
<td>100 gpd</td>
</tr>
<tr>
<td>Single Family Residential</td>
<td>Bedroom</td>
<td>150 gpd</td>
</tr>
</tbody>
</table>

The final consideration for estimating water demand for the project would be the need for water storage. The need for water storage can usually be determined by the presence of one of the following concerns:

1. Equalizing the supply and demand of a site. This is especially important in arid areas where the rainfall recharging of the water table is sporadic.
2. Leveling out pumping requirements. This is a large concern when there are a lot of industrial buildings.
3. Providing water during source or pump failure. This is the classic water source pollution/water treatment plant failure problem. It is common engineering practice to have 72 hours of water storage in order for rationing and other emergency methods to be deployed.
4. Blending water sources. This is also quite common where two sources, usually well water and lake type supplies, are used to supply an area.

In order to demonstrate the process of choosing water line sizes and locations, we have analyzed our proposed 160 acre development (see section 6) to determine water consumption, water demand and pipe sizing.

**New Pipe Characteristics:**
- Length of Pipe = 8,100 l.f. (approximate)
- Head of Fall = 95'
- Average Slope = 1.17%

**Water Demand Assumptions:**
- 2 Churches (500 seats per church)
- 87 Single Family Lots (3 bedrooms per house)
- 435 Medium Density Units (1 per 2000 sf of area reserved)
- 24 Commercial Businesses (1 per 20,000 sf, parking area included, 100 employees per business)
- 1 High School (300 students)
- 1 Elementary School (300 students)

**Water Consumption per Use:**
- Churches = 10 gpd per seat
- Single Family = 150 gpd per bedroom
- Medium Density = 150 gpd per unit
- Commercial = 100 gpd per employee
- High School = 25 gpd per student
- Elementary School = 12.5 gpd per student

**Water Demand per Use (average daily peak flows - “a.d.f.”):**
- Churches = 10,000 gpd = 0.015 cfs
- Single Family = 13,050 gpd = 0.020 cfs
- Medium Density = 65,250 gpd = 0.100 cfs
- Commercial = 240,000 gpd = 0.371 cfs
- High School = 7,500 gpd = 0.012 cfs
- Elementary School = 3,750 gpd = 0.006 cfs

**Total New Development A.D.F. = 339,550 gpd = 0.524 cfs**

**New Development Area Demand = 679,100 gpd = 1.048 cfs**
House wiring Project

An assessment for the House-wiring Project is completed and a packet is prepared for Service Entrance Inspection to the Navajo Tribal Utility Authority (NTUA). An inspection of each house that, which will mean that funds will have to be secured. In order for a home to have electric service hooked up, it must first be inspected to see that it is wired properly and determine if there is a need for corrections. Once the house passes inspection, the residents must apply for Right of Way, Archaeological Clearance, and funds can be applied for.

Homeowners can contact Bill Gransen from the Kayenta NTUA Branch Office and Ethylene Johns from the Fort Defiance NTUA Central Office. All the Affidavits for the House-wiring project will be submitted once the mapping is completed.

The following is a list of homes that have been wired as a part of the Proposed Power Line Extension Project by the Navajo Tribal Utility Authority, some of which have already had their electric service connected (as of February 23, 2001), denoted by an asterisk (*).

Roads

Roads are a major priority in Navajo Mountain. There are currently almost no paved roads in or surrounding Navajo Mountain. Provision of a paved road connecting Navajo Mountain with Ojato would cut driving time in half and help to encourage tourism and commerce. A large bridge to cross Lake Powell is being investigated as a long-term goal to connect the community with Halls Crossing. This could also help with the distribution of products and encourage more tourist travel through the area.

Sewer and Sanitation

The NECA has been expanding the existing sewer plant and it was expected to be complete by the end of January.

<table>
<thead>
<tr>
<th>Pond</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pond A</td>
<td>60 acre ft</td>
</tr>
<tr>
<td>Pond B</td>
<td>62 acre ft</td>
</tr>
<tr>
<td>Pond 1</td>
<td>22 acre ft</td>
</tr>
<tr>
<td>Pond 2</td>
<td>22 acre ft</td>
</tr>
<tr>
<td>Pond 3</td>
<td>35 acre ft</td>
</tr>
<tr>
<td>Pond 4</td>
<td>26 acre ft</td>
</tr>
</tbody>
</table>

There are currently two incoming lines from the BIA, with no plans for future expansion, although the capacity is enough to pick up 300 more customers.

The following table is a guide to determine sewer requirements for various types of land uses. In order to use the table, first determine what type of land use is being proposed and the capacity of the building, by number of people (students, employees, bedrooms, etc.). This will tell you how many gallons per day of sewer are produced.
### GALLONS PER DAY BY USE

<table>
<thead>
<tr>
<th>Church 8/seat</th>
<th>Elem. School 10/student</th>
<th>High School 20/student</th>
<th>Commercial 20/employee</th>
<th>Medium Density Residential 53/unit</th>
<th>Single Family Residential 140/bedroom</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>53</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>20</td>
<td>40</td>
<td>40</td>
<td>106</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>30</td>
<td>60</td>
<td>60</td>
<td>159</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>40</td>
<td>80</td>
<td>80</td>
<td>212</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>50</td>
<td>100</td>
<td>100</td>
<td>265</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>100</td>
<td>200</td>
<td>200</td>
<td>530</td>
</tr>
<tr>
<td>20</td>
<td>160</td>
<td>200</td>
<td>400</td>
<td>400</td>
<td>1,060</td>
</tr>
<tr>
<td>50</td>
<td>400</td>
<td>500</td>
<td>1,000</td>
<td>1,000</td>
<td>2,650</td>
</tr>
<tr>
<td>100</td>
<td>800</td>
<td>1,000</td>
<td>2,000</td>
<td>2,000</td>
<td>5,300</td>
</tr>
<tr>
<td>500</td>
<td>4,000</td>
<td>5,000</td>
<td>10,000</td>
<td>10,000</td>
<td>26,500</td>
</tr>
</tbody>
</table>

### Community Solid Waste Transfer Station
In 1994, the Navajo Mountain Chapter approved .8912 Acres of land directly across from the Chapter House to develop a transfer station. Once established, the local resident can than haul their household trash to this location. This will eliminate people dumping trash in open rangeland where animals will get into the debris.

Much education will need to be provided in what waste and what can be recycled. Managing the operation of the station will also have to be addressed. Funds for the construction will also have to be sought. The Navajo Nation Solid Waste Management Program has already committed funds to this project.
Proposed Water Line and Nearby Homes

This map shows the proposed water line project for the Navajo Mountain Chapter by the Indian Health Services. The numbers on the map above represent individual homes that will be served by the water line.

Power and utilities
There is currently no power in the area. Many homes, especially in the Piute Mesa area, have receptacles and lights, but no connection. Most of these homes have been waiting for electricity for years.

The installation of solar panels at various locations could provide power at a low cost for many people and could be executed very quickly, although it would involve fairly high initial cost. They could be installed on the roofs of homes, especially those that are farther away from developed areas and where it is not feasible to run actual electric lines to the homes.

The people of Navajo Mountain currently use generators for small amounts of power, propane for cooking and heating ($1.50 per gallon), and firewood ($65 for a cord) and coal ($45, 1/2 ton, 2 times/winter) for heating.
Rainbow Village Area Demand = 16,800 gpd = 0.026 cfs
Navajo Mountain Area Demand = 47,520 gpd = 0.074 cfs

Approximate Total Design Demand = 750,000 gpd = 1.161 cfs**

**Note:** The Eodeshee Springs area water demand statistics were unavailable, so the Total Design Demand was modified by adding approximately 18,000 gpd.

Pipe Sizing:

While an 8" pvc pipe would probably work for current needs (a capacity of 843,385 gpd), a 10" pvc pipe (a capacity of 1,515,349 gpd) should probably be used due to fire prevention concerns, future capacity needs, and the uncertainty of current water supplies. A five-day storage of approximately 1.3 Mgal is recommended for the new development.

Notes: The above mentioned commercial values are assumed to be office/retail type establishments. If production type factories, which may use substantially more water depending on the goods produced, then the 8" may need to be upgraded to a 12".

No in-depth analysis could be done on the need for pumps on the waterline without the hydraulic characteristics being known on the source pipe (pressure, size, etc). However, with a head change from the point of connection to the development of 95' and a head loss due to friction (which in long single pipe systems is the main constituent in head loss for the entire system) of only 44.3', any pumps needed would most likely be due to fire prevention concerns or any multi-story buildings. Also, if this line may serve developments further downstream from the site, then pumps may be needed to give additional pressure head.
The Land Use Plan is the result of the gathering of information and the analysis of the needs of the chapter. It shows the areas chosen for development and the use for which it is intended. The narrative explains the principles that guided the choice of the various land areas and the possible means for addressing the concerns of the community.
navajo mountain chapter planning area

location key

refer to 5-2 for description of locations
Navajo Mountain Chapter  
Land Use Planning Approach  

The planning approach that was employed throughout the process included an interactive open forum format. Over the course of the year we held six public meetings and had representation from different personnel along with the Community Land Use Planning group at other scheduled meetings. (Refer to sections I-4 and A-21 for meeting descriptions and schedules.) As presentations were made, the floor was opened up to topics regarding planning, development, and community amenities. The following is a list of the topics that the people of Navajo Mountain Chapter directed us to concentrate on.  

The overriding approach for Navajo Mountain was the development of multiple development cells. The Chapter identified several areas that they wanted to concentrate on. The following areas have been identified and are mapped and described in this section.  

1. 160 acre development  
2. Old Windmill development  
3. Deep Canyon development  
4. Piute Mesa Subdivisions  
5. Resort Development  
6. Equestrian Center/ Lodge  
7. High Mesa Visitor Center  

The last two development areas were discussed conceptually and identified as future ideas.  

Equestrian Center/ Lodge  
This facility would be another tremendous opportunity for the Chapter to attract Tourism. This facility could be located near the existing trail to Rainbow Bridge. Also it would be the natural alternative to the resort, promoting hiking, trail riding and scenic tours for birds and natural fauna.  

High Mesa Visitor Center  
As the road construction arrives from the South, more people will need assistance with directions, tourist site, and general information. This visitor center could begin to promote awareness of the natural surroundings and sites available to experience. Again, the trend is to promote what exists, create revenue, reinvest in infrastructure, and build more.  

Community Design Principles  

These principles will guide the development of the Chapter with regards to conceptual form and configuration. These principles were discussed during the planning process as ideas that would guide development. It is interesting to note that, over the past several years, these ideas have become prevalent across the United States. They are a common denominator for all people in livable communities. The following principles should be implemented to guide the future development of Navajo Mountain.  

- **Natural features determine form of development.** On the northern edge of Navajo Mountain, Lake Powell serves as the boundary for the chapter. On a large scale this is what is meant be the natural edge. On a smaller, neighborhood scale, the arroyo could define the development rather than crossing it and placing the infrastructure where it need not be placed. This saves money on things like bridges, culverts, and expensive construction. The land should always shape the plan.  
- **¼ mile radius defines conceptual edge of neighborhood.** By implementing this simple rule the Chapter can begin to incorporate sustainable development rules, pedestrian friendly walking distances, and an ability to contain but not limit the cluster housing that the Chapter so desires.  
- **All neighborhoods should be based around a center.** This simple idea also goes a long way to increasing the neighbor relationship. We heard several times that putting the homes too close together has a negative impact on the Navajo people. Providing a small park or gathering place at the center of the neighborhood could allow for a place to hold cultural events and promote the spirit of the
Overall Chapter Land Uses Narrative

There would be different scales to these places. Some may be as small as 100’x100’. Others may be larger and be connected to the trail network, with connection the Chapter house at the town center.

- **Commercial developments and civic buildings should contain a center and reinforce civic public space.** From our experience over the course of the year, we found that the Chapter House is one of the most important buildings in the Chapter, if not the most important. All community meetings take place there and a variety of different groups held meetings there, including grazing, recreation, and CLUP committees. We believe that this idea should be more strongly reinforced as the Chapter grows. By surrounding the chapter house with commercial and civic buildings, including things like a bank, a post office, or administrative offices, it truly becomes the hub of the Chapter in a controlled and designed manner, not just by happenstance.

- **Single family residential should be located at the outer perimeter of the town.** Single family residential is the lowest density land use, at about one dwelling unit per acre. The people who live in the Chapter told us not to provide anything smaller than one-acre lots. These layouts fit the design criteria that lower density should be on the outer edges of the development.

- **Single-family neighborhoods with cul-de-sacs should be limited to 800'-1,000' maximum length.** From our experience, many people prefer cul-de-sacs for several reasons. This eliminates through traffic, which is safer for the children. Also, the reduced traffic makes the neighborhood quieter. However, in smaller lot subdivisions, the traffic generated during the peak times of the day can have a negative impact on accessibility. This is not as much of a concern in the one-acre lot neighborhoods, because there will not be a large amount of cars or traffic generated. Thus, cul-de-sacs are a good street type for the Chapter and the lengths should be determined by accessible convenience distance factors for travel.

- **Street types should be hierarchical; collector streets for through traffic, arterials to interconnect neighborhoods, and neighborhood streets to serve housing blocks.** Typically there are different purposes for different streets. A collector street will be designed for higher speeds and higher volume of traffic. It will have the widest right of way. Arterial streets would provide cross access within the Chapter and create major divisions within the Chapter. The smallest streets should be the neighborhood streets, which will have approximately a 40’ ROW and be for slower traffic and lower volumes of traffic. Typically, it is desirable to take the collectors along a naturally scenic area, skirting the flood plain and other areas where no other types of development are desirable.

- **Public parks and recreational areas should be located, first, in and around natural constraints.** Arroyos, drainage areas, creeks, and undevelopable land should determine the public open space and trail locations. Preferably, smaller open areas should be placed within each development (approximately 160 ac.) and be connected to a larger open space network. These areas should respond to the natural land forms and drainage patterns that exist within the development plan.

- **Infrastructure patterns should, for the most part, be symmetrical in nature.** Conceptually, all infrastructure patterns should be thought of in terms of a “tree.” Trunk lines act as “collectors” to receive “branch” or feeder lines. Collector lines will typically be connected to the end source. This approach provides efficient use of lines and they can be looped easily to reduce the times of down service because of a line break.

The Land Use Plan designates areas of land for specific purposes. The following narrative explains what is included within the various land use elements and defines what is meant by the various terms applied to these elements.

**Low density residential**
There are typically a variety of low-density residential uses, which are included in the low-density residential designation. Starting at the lowest density we have one dwelling unit (du) per 20 acres. This is extremely low density and qualifies as a medium sized grazing parcel. Next we have included a possible 1du/10 acres which can be classified as a ranchette. A ranchette would accommodate smaller animals; minimal grazing and possibly small community sized gardens. The one acre parcel is the predominant
residential use density, typically designated as 1du/acre. The single-family one acre lot is approximately 208' x 208'.

Commercial
The types of commercial uses we have incorporated are of the smaller neighborhood type, including convenience store, laundry, and post office. The commercial acres within the land use plan matrix have allowed for a FAR (floor area ratio) of approximately .25. The floor area ratio is the amount of building that is developable per acre of land. Along with the .25 FAR theoretically proposed, we are anticipating typically 1 parking space for every 250sf of building, which is normal in most city ordinances. Only the smaller parcels of commercial properties will be relegated by the formulas and requirements stated above.

Industrial
The industrial land in the plan is located typically on the periphery away from the town center. The designation of uses has been left up to the individual Chapter with regards to “clean” industry or heavy industrial uses. Heavy industry could include power plants, processing plants or manufacturing plants. High-tech, office parks and distribution centers are qualified as “clean” industry.

Recreation
Within this category we have identified a couple different types of uses, the biggest single type being the sports complex and Chapter Park. In the sports complex there would be located baseball/softball diamonds, basketball courts, and other outdoor recreational game areas.

Community
Community land-use areas include churches, educational facilities, banks, civic buildings, and other administration facilities. Typically they are located at and near the center of the plan.

Open space
Within this category several types of open space exists. The most common is chapter market or community space. We have also included interconnecting trail systems so that people of the Chapter can easily walk to other destinations within the Chapter. Other open spaces include landscaping buffers, riparian areas, arroyos, and forested areas.
This development would probably be the first to be built. As Highway 16 is paved and connected to the Chapter house, this development will be needed. We have included a preliminary summary of the water and sewer capacity calculations that this neighborhood will generate. This development will be an example of a sustainable neighborhood. It will include all of the following:

- Community Design Principles (CDP)
- Separate sewer lagoon
- Museum to anchor public/civic space
- Multi-family housing
- Single-family housing
- Sustainable community: jobs & homes

DEVELOPMENT MATRIX

Total Area 160 acres (planning area)

<table>
<thead>
<tr>
<th>NAVAJO MT. - 160 ACRES</th>
<th>ACRES</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>Single Family</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Approx. 86 lots</td>
<td>86</td>
<td>53.75%</td>
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<tr>
<td>Multi-Family</td>
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<td>• 24 @ 3 du/ac. = 72 units</td>
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<td>• 430,000 @ .25 FAR = 108,900sf.</td>
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<td>34.5</td>
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### COMPATIBILITY MATRIX

#### NAVAJO MOUNTAIN 160 ACRE DEVELOPMENT

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<th>Parkway</th>
<th>Airport</th>
<th>Open Space</th>
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<th>Residential</th>
<th>Planned Unit Development</th>
<th>Planned Commercial Development</th>
<th>Neighborhood Commercial</th>
<th>Industrial</th>
<th>Drainage Ways</th>
<th>Civic/Cultural Mall</th>
<th>Commercial Mix Use</th>
<th>Railroad</th>
<th>Recreation</th>
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*○ = Primary Relationship
○ = Secondary Relationship
O = Unsuitable
parks/recreation
residential open space
commercial
medium density residential
single family residential
sewer lagoon

refer to 5-3 for acreage breakdown

160 acre development
Old Windmill development

This development could eventually become a new town center. The orientation and planning of this layout was derived from the incorporation of all of the existing roads and existing rodeo grounds. It incorporates single-family cul-de-sacs, multi-family housing, and administrative offices, and small industrial lots outside of the development.

- CDP
- Separate sewer
- Admin. Offices/head start program
- All types of residential developments
- Old coral to be incorporated into fairgrounds
- Existing road systems kept in tact and incorporated into plan

DEVELOPMENT MATRIX

Total Area 336 acres (planning area)

<table>
<thead>
<tr>
<th>NAVAJO MT. - OLD WINDMILL</th>
<th>ACRES</th>
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<tbody>
<tr>
<td></td>
<td>Total</td>
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<td>Single Family</td>
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<td>• Approx. 216 lots</td>
<td>216</td>
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<td>Multi-Family</td>
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<td>• 22 ac. @ 3 du/ac. = 66 units</td>
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<tr>
<td>Commercial</td>
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<td>• Approx. 800,000sf. Site @ .25 FAR = 200,000sf.</td>
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<td>• 23 acres @ .25 FAR = 250,000sf.</td>
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## COMPATIBILITY MATRIX

### NAVAJO MOUNTAIN OLD WINDMILL DEVELOPMENT

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<th>Planned Commercial Development</th>
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<th>Industrial</th>
<th>Drainage Ways</th>
<th>Civic/Cultural Mall</th>
<th>Commercial Mix Use</th>
<th>Railroad</th>
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- o = Primary Relationship
- o = Secondary Relationship
- O = Unsuitable
parks/recreation
residential open space
sewer lagoon
industrial
commercial
medium density residential
single family residential

refer to 5-5 for acreage breakdown
Deep Canyon development

Again, this development is designed to provide a flexible layout along with a diversity of land uses. We have added a small amount of commercial at the intersection, senior housing up the street, and cul-de-sac single-family blocks around a radial plan. We have responded to the cardinal points of direction for layout and respect the spiritual significance of the Navajo Nation. There are a few existing homes, which will be incorporated into the plan near the center.

- Commercial crossroads
- CDP
- Senior housing
- Tree in center of intersection

DEVELOPMENT MATRIX

Total Area 205 acres (planning area)

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<tr>
<td>Subtotal</td>
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<td>• F.</td>
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<td>Medium Density Residential</td>
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<td>• G.</td>
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<td>Recreation Area</td>
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205 | 100% |
# COMPATIBILITY MATRIX

**NAVAJO MOUNTAIN DEEP CANYON**

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* = Primary Relationship  
* = Secondary Relationship  
○ = Unsuitable
parks/recreation
commercial
medium density residential
single family residential
refer to 5-7 for acreage breakdown

deep canyon
Piute Mesa Subdivisions

These subdivisions are primarily for farming neighborhoods. The Chapter expressed a strong desire to provide affordable housing in the Piute Mesa area. The street layout can be phased, along with the infrastructure, while at the same time providing natural open spaces within the development. The largest of the neighborhoods includes small commercial and medium density housing.

- CDP
- Sustainable
- 1 ac. Homestead/medium density
- Phased development

DEVELOPMENT MATRIX

Total Area 518 acres (planning area)

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<tr>
<th>NAVAJO MT. - PIUTE MESA</th>
<th>ACRES</th>
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<td>Single Family</td>
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<td>• A. = Approx. 115 lots</td>
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<td>• B. = Approx. 100 lots</td>
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<td>• C. = Approx. 80 lots</td>
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<td>• D. = Approx. 23 lots</td>
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<td>• E. = Approx. 170 lots</td>
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<td>Subtotal</td>
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<td>Medium Density Residential</td>
<td>30 ac. @ 3 du/ac. = 90 units</td>
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Piute Mesa Current and Proposed Land Uses Narrative

COMPATIBILITY MATRIX

NAVAJO MOUNTAIN PIUTE MESA

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● = Primary Relationship
○ = Secondary Relationship
○ = Unsuitable
parks/recreation
medium density residential
single family residential

refer to 5-8 for acreage breakdown

piute mesa
Resort Development

The proposed resort would include a world-class hotel, marina, and 18-hole championship golf course. There are several options for the layout and obviously will include a full design study at a later date. The terrain and soil conditions will be a major factor in the exact location of the course. The marina already has an unpaved access road down to the lake from Piute Mesa. This project generated many hours of discussion and has strong backing from the Chapter. Another course location would be to be adjacent to the marina on the slight slope of the mesa. A tunnel could then be put at the low area of the peninsula mesa and connect to Copper Canyon.
Each Chapter within the Navajo Nation has its own personality. This is especially true for Navajo Mountain. It may be one of the Chapters with the most natural beauty. We received tremendous feedback from the Chapter regarding the plan of action. In order for a master plan or land planning to be the most effective, the chapter needs to have ordinances in place to ensure the plan is executed properly. By creating ordinances, there is very little leeway for planning to go in the wrong direction.

The Chapter will need to adopt a set of development ordinances and policies that will be enforced by a Chapter council that is well versed on the goals and strategies of future growth. The main purpose of the ordinances is to further the health, safety and general welfare of the citizens of the Chapter. The policies will provide uniform standards for the development of the land and improvements made on existing developments. The council will enforce the procedures, requirements and minimum standards intended to encourage an appropriate combination of land uses. These procedures purpose are to enhance aesthetic quality, moderate street congestion, secure safety from events such as fire, flood, erosion and landslides, prevent overcrowding of land, provide adequate light and air and provide for circulation, recreation, and other public services and facilities. The policies provide for, but are not limited to development of land uses which protect established neighborhoods, and commercial and industrial districts, allows compatible infill of established areas, provides flexibility for mixing of uses to achieve traditional neighborhood developments, protects significant environmental resources, and make a community livable. The following is a compilation of ideas that the Chapter would like to proceed with.

With regards to road building, submit a request, by resolution, to the Agency Roads Committee of the Western Navajo Agency for inclusion of trail improvement and road establishment projects on the Agency Road Priority List. Anticipated funds for these projects would be from Federal funds under scenic areas for road and trail improvements and developments. The roads should be built in order to address the natural progression from the South. In this way, the development will be in sequence with the roadwork and infrastructure. Development should be sequential and incremental so that, economically, the funding is not wasted on "leap-frog" projects.

With regards to economic development, the chapter is strongly encouraged to work closely with the Division of Economic Development, specifically with the Tourism Department, to secure the necessary information on the proposed development of a motel, restaurant, entertainment center, trail rides and other associated cost and/or the procurement of funds for these infrastructure developments. Along with the tourism board, the Chapter needs to hire a consultant to do further study of the siting of the golf course and the ramifications of irrigation, soil types, and the logistics of shipping goods to the site.

With regards to open space planning, the Chapter needs to work closely with the National Park Services and Agency Roads Committee of the Western Navajo Agency on the Naskahi Marina and road establishment in order to connect the Navajo Mountain and Olijato communities. The marina development would require involvement from several entities, while the road establishment will also involve the Transportation and Community Development Committee of the Navajo Nation Council. Furthermore, a direct road system between the Navajo Mountain and Olijato communities will be of use for delivery of goods and services in order to operate the established marina and other businesses.

Several other topics were discussed throughout the process. Two related subjects are sustainable development and solar energy. Further study and research needs to be done on the requirements for energy required for a typical two or three bedroom home. A simple checklist should be created for anyone who may be interested in procuring the system. The Chapter should assign a committee to follow up on the system and process. In this way, remote solar homes can be activated for living and brought on line as electric power comes available.

At one planning meeting we took a pole of the young people at the meeting and asked them what would it take to keep you at the Chapter? The answers varied but were all related. The answers were: Family, jobs, Building, and the ability to receive a quality education from a community college or vo-tech college. These ideas reflect the bigger issues which are trying the Chapter and its young people.
The Navajo Mountain Chapter should concentrate on promoting sustainability as a primary development concept. This includes the creation of a balance between housing and jobs, along with the reduction of dependency on natural fossil fuels. The solar research that the Chapter is planning on doing is a beneficial start for energy sources. When developments are planned, there should be a mixture of various housing types, commercial/retail opportunities, and natural open space. This provides the opportunity to reduce the use of automobiles also.

Housing diversity is a key element in the future growth of the Chapter. Affordable housing, elderly housing, and clustered housing for families all need to be incorporated into a housing commission so that the people who want homes have an alternative to NHA housing.

Besides the tourism aspect of the Chapter, the agricultural aspects of the Chapter is key to the growth and future of Navajo Mountain. The drainage issues that we spoke about earlier must be addressed for detention and irrigation. Community Farming and individual grazing must be coordinated so that everyone may benefit from the water strategies that the Chapter will eventually adopt. Grazing is king, but farming creates revenue and jobs.

As stated earlier, the Native American Housing Assistance and Self-Determination Act (NAHASDA) has provided funds to the Office of Navajo Government Development in order to initiate land use planning and technical assistance for chapter governments within the Navajo Nation. The objective is to develop a land use plan based on the needs and concerns of the community, with an emphasis on designating land for housing and coordinating infrastructure development. This land use plan is to comply with the Navajo Nation Local Governance Act. The fundamental goal of the Land Use Plan is to prepare for the growth of the future.

Several organizations were involved with the study that took place over the course of one year. The Office of Navajo Government Development (ONGD) provided funding through the Office of Navajo Government Development. The Atkins Benham Planning Team was hired by the ONGD to develop the Land Use Plan and document the process. We made presentations to the local chapter and submitted information to the ONGD and the local chapter. The Local Chapter's representation was the Community Land Use Planning Committee (CLUP). The CLUP was comprised of local residents who helped review work that was done by the Planning Team. In some cases, CLUP members were also chapter officials or people expertise in areas relating to planning. They also attended and helped coordinate meetings with the public and the planning team. The Local Land Use Planning Assistant (LLUPA) worked under the Planning Team and acted as a local liaison and planning facilitator of monthly meetings. The LLUPA did research in order to obtain information about existing conditions in the chapter and helped inform the Planning Team about new information that developed.

The Land Use report was intended for the benefit of three major groups. The Navajo Nation will be affected in terms of commerce, providing jobs, and increasing income. As each of the 110 chapters adopts a Land Use Plan, the Nation will become stronger as a whole. On a Chapter level, the adoption of a Land Use Plan is essential in fulfilling the Local Governance Act, which allows the local chapter to make more decisions concerning its own policies. The chapter also benefits from increasing commerce, new jobs, new development, increased tourism and increased public awareness of planning issues. But at the most rudimentary level the individual truly benefits the greatest. The Land Use Plan designates land for specific uses such as new homesites and proposes new infrastructure for new and existing homesites. The individual residents of the chapter also will benefit from new jobs from construction or incoming businesses. Fulfillment of the Local Governance Act requirements will allow for a more localized government with better awareness of their personal needs.
Based on the stated and implied intentions of the Navajo Nation and the Chapter, the following goals were identified for the project:

To create guidelines for development and prepare for the growth of the future

To provide a Land Use Plan that meets the requirements laid out in the Local Governance Act

To allow for the construction of new housing by designating areas for future housing developments and specifying locations for new utilities and infrastructure

To promote a better economy by designating land for commercial and industrial development

Several meetings identified these goals with the people who live in the Chapter of Navajo Mountain. Perceived needs and ideas were identified with Chapter Officials and along with these common goals, objectives and problems were identified in similar planning programs, which are being held concurrently with adjacent Chapters. This is the beginning of thinking “Regionally”.

Reflecting on the entire process we offer the following contributions. The communication between the consultant and the people of Navajo Mountain for the most part was not a problem. At times we wish we could have presented in Navajo. Typically, someone was able to translate the essence of our presentation to the people who could not understand English. Further attempts should be made to speak the Navajo language for any consultants that follow.

The scheduling of meetings was at times frustrating because of the number of activities that people had previously scheduled. Over all, once we were able to convey the purpose of the meetings, the attendance at the subsequent meetings increased. Different chapters have different preferred times. An effort should be taken to identify these times early in the process so that the Chapter gets some sense of regularity when it comes to meetings on this topic. Another issue at the meetings was that people admitted to having a hard time understanding the “bubble diagrams” and planning maps that we presented. We made a concerted effort to make sure that people understood the ideas even though they might not understand the drawings.

The survey that was distributed early in the process was poorly received. People had the impression that their privacy was being invaded. After being asked similar questions by the local staff, people were more open with the information and thus provided critical demographic data that was required for the report. We also concentrated on taking verbal surveys at the Chapter meetings to help gain consensus on needs and desires.

The LUPA program was a very interesting part of the process. We, as the consultant, gained respect early on for the local data gatherer. In Navajo Mountain’s case the LUPA did a great job throughout the project. He gathered the appropriate data, rallied the people around the project and followed through to the end of the process. However, to aid in research and gathering, there must be more of an attempt to notify the various agencies about the purpose of the project and to make them aware that the LUPA will need certain critical pieces of information.

The final report is the beginning of the next step. Chapter leadership must embrace and use the report as a tool for the future planning of the Chapter. The plan of action spells out certain specific
tasks to incrementally move ahead. We believe the people will be behind this effort because of their interest along the way. We hope that in some way, both NAHASDA and the consultant can maintain contact with the chapter to encourage and promote the continuation of this fantastic project.

One of the overriding principles that we tried to integrate into the entire process was the cultural and spiritual significance of the Navajo culture. Our subdivision orientations paid respect to the four cardinal directions along with providing maximum flexibility for future growth. The idea of crowding many people into smaller homesites, placed closer together, was obviously contrary to the natural tendencies of a group of people that is accustomed to open grazing, large expanses of land, and natural distant edges to their lands. This plan hopes to provide a sustainable pattern of development, raise the quality of life, and provide the physical environment for a higher level of social interaction for all the people who live in the Chapter of Navajo Mountain.
The majority of the documents in the appendices are general information provided for background information or ideas that the people of the chapter expressed interest in. Many of these documents were provided in response to specific questions asked in public meetings.

Allison, Dave. *Navajo Tribal Utility Authority (NTUA)* water dept I, Phone conversation about tanks and active wells, (520) 777-5727.


Glen Canyon National Recreation Area. *Lake Powell*. Phoenix, AZ.


Lynch, Roger Indian Health Service (IHS). Phone conversation about new sewer lagoon, (520) 729-3502.


Myron, Pam, NTUA Electric division. Phone Interview, (520) 729-5721. 26 June 2001.


Navajo Nation Department of Fish and Wildlife. Chapter Guide for Wildlife in Land Use Planning for Local Governance Act Initiative. Window Rock, AZ.


Navajo Nation. Division of Community Development.


The Official Navajo Nation Visitor Guide. Discover Navajo.

ONLA, Lands Department, Division of Natural Resources. Type of Navajo Nations Lands and Leases. 1998.

Parks of the Navajo Nation. The 7 Wonders of Navajoland. 19 Navajo Nation 57 Parks and Recreation.


The purpose of this document is to present information that has been collected and compiled throughout the Community Land Use Planning process. It is intended to serve many purposes at once: to fulfill the requirements of the Land Use Plan as laid out by the Office of Navajo Government Development, to guide the chapter through various stages of development, to provide individual members of the chapter with a guide for things they can do to improve their community, and to inform potential businesses and residents of the existing and planned benefits available in the chapter. Ideally, this document will be made accessible to anyone who is interested in the future of the chapter, whether they are a lifelong resident or someone from outside the reservation. Because of the various audiences that this book intends to reach, the information ranges from broad background information to very specific ideas for the chapter and individuals. In that way, this document should contain something helpful for any reader. This section provides background information on the project itself, including various people involved in the process and other standards that have influenced the project.
Atkins Benham is one of the largest planning/architectural/engineering firms in the world. The U.S. office is 91 years old with over 1000 employees in the U.S. and 12,000 worldwide, and annually designs over $1 billion in new construction. The firm first provided design services to municipal clients in the U.S. in 1909 and continues providing service today in virtually every area of engineering, planning and architecture. Projects include roadways and bridges, drainage, power generation, water/sewer, parks, lakes, sports arenas, and buildings for education, government, research, industry, community services and merchants. Our planning group is the exclusive provider of planning and design for one of the nation’s largest planned community developers, and has broad experience in the design of parks, pedestrian spaces, and bikeways.

We have a staff of thirty-four in our Arkansas office in Lowell, including twenty-two employees with professional degrees. They are supported by administrative staff, technicians, and designers with more than 100 years of combined experience. Other Atkins Benham offices and local consultants assist our staff as needed to provide additional production staff or to provide expertise that may be required for some projects.

The real strength of Atkins Benham, Inc. is our diversity. It is difficult to be the best in even one endeavor, but Atkins Benham, Inc. has succeeded in many areas. We are ranked in the Top one percent of all design firms, worldwide.

Team members

Gary Carnahan, P.E., Managing Director, BSCE, MSCE (Environmental)
Twenty-five years experience including environmental permitting, project management, streets and drainage, utilities, wastewater plants and pumping stations, lakes, golf course engineering, and commercial and residential development.
Kevin Kuehn, Asst. Managing Director, Environmental Planner, A.I.C.P., B. S. Architecture, M.E.P., Thesis Pending
Thirteen years experience including parks, trails, golf courses, master planning, community development, commercial centers, and architecture for homes, townhomes, commercial and office buildings.
Jessica Lewallen, Architectural Intern, B. Architecture
Current experience in residential developments, hospitals, churches, and commercial developments.
Marilyn Bredehoft, Architectural Technician
Twenty-two years experience including mechanical, electrical, civil, and architectural drafting for manufacturing, commercial and industrial projects.
Sherri Burkes, NCIDQ Cert. # 015916, Interior Designer
Seven years experience in interior design and space planning, including small to large corporate projects, exterior signage, churches, business park development, banks and technology centers.
Brent Vinson, Registered Landscape Architect, ASLA, B. Landscape Architecture
Six years of experience including landscape design, planning, master planning, grading plans, development plans, parks and trails. Served as Associate Planner for City of Fayetteville and has expertise in interpretation and enforcement of zoning and development regulations.
Leanne Roy, Civil Drafting Technician
Civil drafting experience on projects including Ute Mountain Casino, Texas Air National Guard, and San Juan County, Aztec NM. She has lived on the Navajo Reservation for about 26 years. Her maternal clan is the Clump Tree Clan and her maternal grandparents are the Black Sheep Clan. Her paternal clan is the Mexican Clan and her paternal grandparents are the Salt Clan.
On April 20, 1998, the Local Governance Act (LGA) was adopted. Its fundamental purpose is to grant local authority to the chapter over local matters, assuring accountability within the local community. The local people can then accept responsibility for their own community and exercise true governmental authority.

In order to become self-sufficient, all chapters are required to adopt a land use plan by the year 2003. The plan should designate future land use based on goals and principles vocalized by the residents of the community. It should encourage housing and business development, establish infrastructure, and identify and preserve sacred areas within the chapter boundary. A land use plan provides direction and standards for housing, architecture, and zoning. The final plan can be amended as required later by community member requests, changes, and developments.

The chapter is authorized to administer land after the land use plan has been completed. This includes the approval of homesite and business leases and development of regulations for the use of land. The purpose of the land use plan is to identify and implement land uses that will successfully serve the people and protect the chapter's resources for the future.

The Local Governance Act lists three reasons to develop land use plan:
- Comply with the Local Governance Act
- Apply for state and federal funds for development
- Identify the location of facilities, residential areas, and other areas

The LGA identifies the legal process through which a chapter is to adopt a community land use plan:
- The chapter must approve and pass a resolution stating their desire to develop a land use plan.
- The chapter must establish a Community Land Use Planning (CLUP) Committee to approve and oversee the planning process.
- The CLUP may establish subcommittees if needed.
- The CLUP must hire a Planner to work with the CLUP and the community.
- The Planner must review and assess all pertinent data to prepare a land use plan.
- The community must review the Plan and comment in writing or in testimony.
- The CLUP must adjust, finalize, and submit the plan to the Transportation and Community Development Committee of the Navajo Nation Council, where it shall be approved.
Scope of Work

The Navajo Nation required the Planning Team to provide information based on the following divisions:

Community Participation Plan
The Planning Team scheduled meetings with the Community Land Use Planning (CLUP) Committee and the Local Land Use Planning Assistant, who in turn publicized the meetings. These meetings were held in order for members of the CLUP Committee and the community to voice their needs and concerns, and for the Planning Team to get feedback on the development of the Land Use Plan.

Community Assessment
The LLUPA was essential in identifying existing conditions within the chapter. Future needs were determined based on ideas expressed by the chapter members at the Planning Meetings. Community demographics information was obtained from census information and surveys that were distributed by the LLUPA. Land status, residential needs, grazing and agriculture, commercial and industrial development, community and public facilities were identified using information gathered from various existing maps and ordinances, aerial photography, USGS maps, and GIS maps.

Land Suitability Analysis
Most of the land suitability information was obtained by members of the Planning team or the LLUPA, from various Navajo Agencies including the Navajo Nation Department of Fish and Wildlife, USGS maps, etc. The land suitability analysis includes information about ground and surface water, soils, slopes and topography, vegetation and wildlife, culturally significant areas, environmentally sensitive areas, and accessibility.

Infrastructure Analysis
Most infrastructure information came from GIS maps provided by the Navajo Tribal Utility Authority (NTUA). Maps and plans of specific developments were used when available.

Land Use Plan Document and Corresponding Maps
The Land Use maps were prepared by the Planning Team to graphically depict the ideas presented to and discussed with the CLUP Committee. They were created based on traditional planning guidelines, needs vocalized by the citizens of the chapter, Navajo Nation Land Use Policies.

Comprehensive Report
This document was created to be read by a variety of audiences, from the Office of Navajo Government Development, to the citizens of the Chapter, to people who know very little about the Navajo people. It is presented as an explanation of the background of the involved parties, the process of the specific Land Use Plan and a description of the recommended action required.

The process of developing the Land Use Plan did not necessarily follow the order or time frame implied by the Scope of Work. For example, community assessment, land suitability analysis, and infrastructure analysis information was gathered throughout the process. Rough drafts of the Land Use Plan were created very early in the process and revised constantly throughout the process.

A series of packages were sent to the Office of Navajo Government Development that documented the progress of the Planning Team. These packages were often compiled of maps, notes from community meetings, rough drafts and revisions of the Land Use Plan, and schedules of upcoming milestones.
The following laws are related to planning and should be considered before any major action is taken concerning these areas.

**Federal laws related to land use activities**

**Presidential executive order 12866 — regulatory planning and review 1993**
Allows tribal government to assist in identifying regulations that impose significant or unique burden on them and are inconsistent with the public interest.

**Federal land policy and management act (FLPMA) 43 U.S.C. sec 1610.3**
Requires coordination with local government in addition to public involvement by regulation for development of land use plans.

**National historic preservation act of 1966 (NHPA) section 106**
Requires agencies to consider the effects of actions any projects on cultural resources.

**National environmental policy act of 1970 (NEPA)**
Requires compliance with federal laws about environmental protection on any project entirely or partially financed, assisted or approved by federal agencies.

**Antiquities Act of 1906**
Forbids disturbance of antiquities on federal land without a permit from the secretary of the interior, allows president to withdraw public lands to create national monuments.

**Archeological resources protection act of 1979 (ARPA)**
Forbids disturbance of archaeological sites on federal and Indian land without a permit.

**Executive order 11988 floodplain management 1977**
"Avoid direct and indirect support of floodplain development."

**Executive order 11990 protection of wetlands 1977**
"Avoid direct and indirect support of new construction in wetlands."

**Public law 104-33, 1966**
Rio Puerco watershed act.

**Navajo laws related to land use planning**

**Title 2** Authority of the standing committees to approve Land Use Plans

**Title 3** Navajo Nation Uniform Grazing Act

**Title 13** Chapter 7, Subchapter I-7, trailer courts (standards and violation provisions)
Chapter 11, Subchapter 3, gravesites (designation of sites)
Chapter 15, Section 23, child day care centers (standards)
Chapter 17, nursing homes (standards)

**Title 14** Chapter 3, zoning sides of highways (zones commercial areas on both sides of roads on tribal land, distance of 750 feet)
Title 16  Chapter 1, policy on acquisition of land and procedures  
Chapter 5, acquisition of land through purchase or gifts  
Chapter 7, use and disposition, subchapter 3, permits for surveying, prospecting and other surface activities  
Chapter 9, homesites  
Chapter 11, land for charitable use and churches  
Chapter 13, compensation for improvement  

Title 26  Local Governance Act  
Section 2004, minimal standards  

Issues that have not been addressed by the Navajo Nation Council may be handled by the chapter, subject to approval by the TCDC.
Navajo Nation Overview

Of the 500 Indian tribes and 310 reservations in the United States, the Navajo Nation is home to the largest tribe. The size of the Navajo Nation is comparable to the size of the state of Virginia. The land is characterized by arid deserts and alpine forests, with high plateaus, mesas, and mountains reaching up to 10,500 feet above sea level. There are also low valleys at 5,500 feet above sea level. The Nation's mountains, canyons and mesas were formed by volcanic activity, wind and water erosion. The natural wonders of the Navajo Nation bring over five million tourists to the area every year. The tourism industry generates over $600 million in revenue in the Four Corners area, but the Navajo Nation receives only 7% of it because of the lack of facilities, accommodations and transportation.

The Navajo Nation is a self-governing nation with its land base located in Arizona, New Mexico and Utah. Unlike many other Indian Nations in the United States, the Navajo Nation has no gaming or gambling. It comprises about 17.6 million acres, or about 25,000 square miles, in the four-corner region. This is one third of all Indian lands in the lower 48 states. Elevations range from 2,760 to 10,388 feet above sea level. Of the 17.6 million acres of the Navajo Nation land, about 82% is Navajo Tribal Trust, 9% is Navajo Tribal Fee, 4% are Individual Navajo allotments, 2% is state land and less than 1% each belong to US Forestry, BLM Leases and Navajo Government. About 5 million acres are forest, about one tenth pine and fir and the remaining is pinon and juniper. The forest receives an average of 20 inches of rain per year. Annually, 9 to 12 thousand acres are harvested, generating over $20 million in revenue.

The Navajo Nation's coal, oil and gas reserves are its most profitable resources. It is estimated that the Nation contains 40 million tons of uranium, 4 billion tons of coal and millions of barrels of oil. There are also significant deposits of copper, fractured sand, helium, gypsum, clay, sand, and gravel. Another major portion of the economy on the reservation comes from agriculture. Many of the crops, like corn, squash, and beans can be grown without irrigation, by using a dry farming method. Livestock is also another economic resource, including sheep, horses, goats and cattle. In addition to being farmers the Navajos, also had great skills in basketry, silver smithing, rug weaving, sand painting and Navajo art.

The Navajo economy is often compared to that of a third world country, because of lack of education, income, paved roads, modern housing and amenities. One major advantage for the Navajo people, though, is the presence of the United States government programs such as the welfare system and social security to provide income to the populace.

The Nation is divided into 5 agencies and 110 Chapters, their populations ranging from a few hundred residents to several thousand. Census 2000 information indicates that there are now 180,462 people living on the Navajo Nation, with 96.4 percent being Native Americans. There are approximately 56,000 housing units within the Navajo Nation. The Navajo Housing Authority maintains about 6000 housing units, while the Bureau of Indian Affairs Manages over 2000 units. Indian Health Services maintains close to 1000 units while others are maintained by various agencies such as Chinle School, Tuba City School, Kayenta School, Central Consolidated School, Navajo Tribal Housing, Window Rock School, Pinon School and Red Mesa School.

The Navajo Nation contains approximately 3900 miles of paved roads, 7600 miles of...
Navajo Nation Overview

The Navajo Nation flag was designed by Jay R. Degroat and adopted by the Navajo Nation Council in 1968. The shape of the Navajo Nation is shown in dark brown on a tan background. The four sacred mountains are shown at the four cardinal points. A rainbow symbolizing Navajo sovereignty spreads over the Nation and the sacred mountains. In the center of the Nation is the sun above two green stalks of corn that surround three animals, an oil derrick, a modern sawmill, a traditional hogan and modern home. These symbols point to the nation’s agriculture, industry, natural resources, and its past and future.

The Great Seal of the Navajo Tribe was designed by John Claw, Jr. and adopted in 1952. The arrowheads that point outward symbolize the tribe’s protection within the United States. In 1932 there were only 48, for the 48 states but the number was increased to 50 to include the addition of Hawaii and Alaska. A rainbow circles the seal, with an opening at the top, considered the east. This represents the Tribe’s sovereign immunity. The sun shines from the east over the four sacred mountains. Each of the mountains, located at one of the cardinal points, is given a symbolic color. White in the east represents White-Shelf Woman, blue in the south represents Turquoise Woman, yellow to the west represents Abalone Woman and black to the north representing Jet Black Woman.

The Navajo people’s history has been difficult. In the fall of 1863, Colonel Kit Carson received orders from the U.S. Calvary to destroy the livelihoods of the Navajos and force them to go to Fort Sumner, New Mexico. The evacuation of the Navajos took place during the Civil War. Faced with starvation, the Navajos surrendered to the U.S. Cavalry. About 15,000 Navajos made up the Navajo Nation at the time and about half were forced to make the 350-mile walk to Fort Sumner. Today the Navajos call this “The Long Walk.” The pace the Navajos were forced to endure cost the lives of many pregnant women and children, who died from winter weather, exposure, starvation and malnutrition. It took about one year for the U.S. Cavalry to get the Navajos to Fort Sumner. When the Navajos were held by the United States government at Fort Sumner, they couldn’t see their four sacred mountains. During the four years of captivity, about one fourth of the Navajos died from various diseases.

In 1868, a treaty was signed to have the Navajos return to their homeland, which they thought would be a dry deserted wasteland. The U.S. Government later found out the land is rich in uranium, coal, oil and gas. It was a difficult and slow process for the Navajos to rebuild the livelihood they once were accustomed to. Through all the hardship and obstacles the Navajo population grew from 12,000 in 1869 to 35,000 in 1930.

By 1941, when the Japanese made a surprise attack on the Pacific Fleet in Pearl Harbor Hawaii, the Navajos had greatly improved and regained their livelihood. During World War II, the Japanese broke every code the U.S. Marines used. A white man by the name of Philip Johnson, a Civil Engineer from Los Angeles, had the idea to use the Navajo language because it had never before been written down. Mr. Johnson’s father was a Protestant Missionary on the Navajo reservation and by the time he was 9 years old he became fluent in the language. Only about 40 non-Navajo could speak the language, none of them being Japanese. Recruitment began at Ft. Defiance, Arizona for the first group of Navajo Code Talkers. The first unit consisted of 29 code talkers and later rose to 420 code talkers.

The Navajo Code Talkers developed the double code themselves. They would use the Navajo translation of an English word to represent the letter the English word began with. For example, “Wol-la-che,” Navajo
for "Ant" stood for the letter "A." "Shush" meant "Bear" in English, which stood for the letter "B." "Muse" meant "Cat" for the letter "C." For objects like a battleship they would use "Whale," for a dive bomber they would say "chicken hawk." For military officers like a Major General, they would use the Navajo word for "two stars." The unbroken code of the Navajo Code Talkers helped to win World War II.

The Navajos were finally given the right to vote in Arizona in 1948, followed by New Mexico in 1953 and Utah in 1957. The Navajo Nation has now grown to be the largest and most powerful Indian tribe in the United States.

The land currently inhabited by the Navajo Nation was not established all at once. It began with a treaty in 1868 with lands being added up until the 1950s. The following diagram shows the changes in the reservation land over the past 150 years.
The first Navajo Nation council was established in 1922 to function as a business council. It was created in order for the Secretary of the Interior to obtain approval to lease oil from the Navajo people. The Navajo people were allowed greater involvement in their own affairs by the creation of the Tribal Council in the 1930’s. This group of 12 delegates and 12 alternates was organized and authorized by the Secretary of the Interior. The current Navajo Nation Council consists of 88 delegates and has established 12 standing committees.

In 1989, the Navajo Tribal Code was amended in order to reorganize the Navajo Nation Government. The Tribal Code eventually became the Navajo Nation Code, which reorganized the structure of the government so that the Navajo people could be more self-governed. The reorganization also established the office of the Speaker of the Navajo Nation Council, the presiding officer elected for a two-year term from the members of the Navajo Nation Council.

Just as the United States government can tax its residents to support programs, the Navajo Nation taxes its own residents in order to raise money for various programs and projects. Much of the Nation’s external revenue comes from federal grants. The Nation also can regulate fishing and hunting, regulate use of tribal territory and reservation property, require permits for various businesses and impose land use ordinances. The Tribal courts deal with civil cases that occur on the reservation. Federal courts handle major crimes such as murder, arson, burglary and robbery. The Navajo nation also operates its own educational system. Almost all Navajos attend Navajo elementary, middle and high schools on or near the Navajo Nation.

The Navajo Nation is divided into political entities called Chapters. The first Chapter meeting was held in Leupp in 1927. They serve the same purpose as counties, or parishes, and are a forum for solving community issues and problems. Chapter leaders are elected by the people. In addition, Chapters elect delegates to the Tribal Council. The Tribal Council first met in 1923 after being defined by Bureau of Indian Affairs regulations. The number of delegates for the chapter is based on its population, so the more populous chapters may have several delegates, while smaller Chapters may share a delegate with other Chapters. Chapter meetings are usually conducted in Navajo. They can be lengthy if topics of high community interest are involved since everyone is usually given an opportunity to state his/her view. They are similar to “town hall” meetings elsewhere. There must be a minimum of 25 people in attendance and the rules governing Chapters are contained in the Navajo Tribal Code.

Past Tribal President Albert Hale saw a need to distribute control of local matters to the Chapters, but met with little success in executing the transition. The process of redistribution was begun in 1995 with the writing of the Local Empowerment Act. The lack of trained staff at local levels to assume the responsibilities of local government is seen as a significant drawback to this idea. At this time, much of the control of what happens at the Chapter level remains in the hands of officials in Window Rock, under the provisions of Title II, which defines Navajo Government. The Local Governance Act was adopted in 1998, which delineates and sets into motion the process by which Chapters can gain more local authority. Adopting a Land Use Plan is one of the requirements to fulfill the Local Governance Act.
The Navajo are a nomadic people from the Athapaskan language family who refer to themselves as the Dine, “the people” in their native language.

Traditionally the Dine live in hogans, shaped like an octagon and made of mud and logs. In the winter the Hogan is kept warm and in the summer it is kept cool. The traditional attire for a Navajo woman is a velveteen shirt, a pleated cotton skirt, jewelry made of silver and turquoise, moccasins for the feet, sash belt, concho belt and a wool shawl. For a Navajo Man, traditional wear includes a velveteen shirt, concho belt, jewelry made of silver and turquoise, moccasins for the feet and a wool robe, similar to a woman’s shawl but without fringe.

History promised that the Dine would one day save the world. Many believe this has already happened, noting the extraordinary contributions made by the Navajo Code Talkers of World War II. The Navajo people believe their nation will survive forever.

As “the Earth People,” they have the utmost respect for Mother Earth, Father Sky, as well as fellow man, animals, and insects. They also believe the Holy People have the power to aid or harm the Earth People. The number four plays a significant role in the Navajo religion. The Holy People establish the First Four Original Clans, with each child being born to the mother’s clan. The Dine has grown from four to more than 130 clans. The Dine teach that just as corn needs four elements to grow: sunlight, water, air, and soil, a Navajo needs four things to live: life, work, human relations and respect. A Navajo strives to develop each of these areas equally. There are also four directions, four seasons and four colors associated with the four sacred mountains.

To a Navajo the sacred mountains are representative of protection and blessings. The four sacred mountains enclose the land of the Navajos. To the East is Mount Blanca, near Alamos, Colorado. It is known by the Navajo as “White Shell Mountain.” White represents purity and gentleness, and the reproduction of the Dineh is symbolized here. To the South is Mount Taylor, near Grants, New Mexico. It is known by the Navajo as “Turquoise Mountain.” The Holy people placed turquoise at the foot to the crown. Strength is symbolized here. To the West is Humphrey’s Peak at Flagstaff, Arizona. The Navajo call it Abalone Mountain. It represents the twilight in the evening. To the North is Mount Hesperus in the La Plata Mountains located near Durango Colorado. It is known as Jet Mountain. It represents Onyx Strength, which symbolizes darkness or has the authority over the underworld, and is also considered mountain of strength and government.
Navajo Demographics

The Navajo birth rate is 27.6 per 1000, almost twice the US birth rate of 15.5 per 1000. The Navajo death rate is slightly higher than the United States, 640.6 per 100000 compared with 513.3 per 100000. The Median age of the Navajo people is 22.3 years, compared with the United States median age of 33.4.

From 1980 to 1990, the Navajo population grew 1.2% annually. In 1997, the Navajo unemployment rate was 45.81%, over 10 times the US rate. The economic department assumes that although the statistics suggest that the economy is not very active, there is a strong “underground economy,” in which consumers trade goods or services that are not reported or calculated into the figures, including independent vendors. A number of Navajo people also work for weeks at a time off the reservation and return to their families with their pay. Per capita income for the United States is 4.52 times higher than that of the Navajo Nation. Over 56 percent of the Navajo Nation live below the poverty line. For a family of four, the poverty threshold is an annual income of about $17,000.

Navajo Nation, Utah

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Navajo Nation, New Mexico

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Navajo Nation, Utah, New Mexico, Arizona

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| Subject                          | #   | %
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<tr>
<td>American Indian and Alaska Native</td>
<td>175,228</td>
<td>97.1</td>
</tr>
<tr>
<td>Asian</td>
<td>184</td>
<td>0.1</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>91</td>
<td>0.1</td>
</tr>
<tr>
<td>Some other race</td>
<td>896</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>HISPANIC OR LATINO AND RACE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total population</td>
<td>180,462</td>
<td>100</td>
</tr>
<tr>
<td>Hispanic or Latino (of any race)</td>
<td>2,296</td>
<td>1.3</td>
</tr>
<tr>
<td>Mexican</td>
<td>1,205</td>
<td>0.7</td>
</tr>
<tr>
<td>Puerto Rican</td>
<td>86</td>
<td>0</td>
</tr>
<tr>
<td>Cuban</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Other Hispanic or Latino</td>
<td>993</td>
<td>0.6</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>178,166</td>
<td>98.7</td>
</tr>
<tr>
<td>White alone</td>
<td>3,955</td>
<td>2.2</td>
</tr>
<tr>
<td><strong>RELATIONSHIP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total population</td>
<td>180,462</td>
<td>100</td>
</tr>
<tr>
<td>In households</td>
<td>179,494</td>
<td>99.5</td>
</tr>
<tr>
<td>Householder</td>
<td>47,603</td>
<td>26.4</td>
</tr>
<tr>
<td>Spouse</td>
<td>22,708</td>
<td>12.6</td>
</tr>
<tr>
<td>Child</td>
<td>80,681</td>
<td>44.7</td>
</tr>
<tr>
<td>Own child under 18 years</td>
<td>58,484</td>
<td>32.4</td>
</tr>
<tr>
<td>Other relatives</td>
<td>23,849</td>
<td>13.2</td>
</tr>
<tr>
<td>Under 18 years</td>
<td>14,882</td>
<td>8.2</td>
</tr>
<tr>
<td>Nonrelatives</td>
<td>4,653</td>
<td>2.6</td>
</tr>
<tr>
<td>Unmarried partner</td>
<td>3,260</td>
<td>1.8</td>
</tr>
<tr>
<td>In group quarters</td>
<td>968</td>
<td>0.5</td>
</tr>
<tr>
<td>Institutionalized population</td>
<td>508</td>
<td>0.3</td>
</tr>
<tr>
<td>Noninstitutionalized population</td>
<td>460</td>
<td>0.3</td>
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</table>
## Navajo Demographics

### HOUSEHOLDS BY TYPE

<table>
<thead>
<tr>
<th>Type</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total households</td>
<td>47,603</td>
<td>100</td>
</tr>
<tr>
<td>Family households (families)</td>
<td>37,903</td>
<td>79.6</td>
</tr>
<tr>
<td>With own children under 18 years</td>
<td>22,989</td>
<td>48.3</td>
</tr>
<tr>
<td>Married-couple family</td>
<td>22,708</td>
<td>47.7</td>
</tr>
<tr>
<td>With own children under 18 years</td>
<td>14,614</td>
<td>30.7</td>
</tr>
<tr>
<td>Female householder, no husband present</td>
<td>11,759</td>
<td>24.7</td>
</tr>
<tr>
<td>With own children under 18 years</td>
<td>6,441</td>
<td>13.5</td>
</tr>
<tr>
<td>Nonfamily households</td>
<td>9,700</td>
<td>20.4</td>
</tr>
<tr>
<td>Householder living alone</td>
<td>8,841</td>
<td>18.6</td>
</tr>
<tr>
<td>Householder 65 years and over</td>
<td>2,697</td>
<td>5.7</td>
</tr>
<tr>
<td>Households with individuals under 18 years</td>
<td>28,087</td>
<td>59</td>
</tr>
<tr>
<td>Households with individuals 65 years and over</td>
<td>9,924</td>
<td>20.8</td>
</tr>
<tr>
<td>Average household size</td>
<td>3.77</td>
<td>(X)</td>
</tr>
<tr>
<td>Average family size</td>
<td>4.36</td>
<td>(X)</td>
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</tbody>
</table>

### HOUSING OCCUPANCY

<table>
<thead>
<tr>
<th>Category</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total housing units</td>
<td>68,744</td>
<td>100</td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>69.2</td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>21,141</td>
<td>30.8</td>
</tr>
<tr>
<td>For seasonal, recreational, or occasional use</td>
<td>11,126</td>
<td>16.2</td>
</tr>
<tr>
<td>Homeowner vacancy rate (percent)</td>
<td>1</td>
<td>(X)</td>
</tr>
<tr>
<td>Rental vacancy rate (percent)</td>
<td>5.5</td>
<td>(X)</td>
</tr>
</tbody>
</table>

### HOUSING TENURE

<table>
<thead>
<tr>
<th>Category</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>100</td>
</tr>
<tr>
<td>Owner-occupied housing units</td>
<td>36,092</td>
<td>75.8</td>
</tr>
<tr>
<td>Renter-occupied housing units</td>
<td>11,511</td>
<td>24.2</td>
</tr>
<tr>
<td>Average household size of owner-occupied unit</td>
<td>3.78</td>
<td>(X)</td>
</tr>
<tr>
<td>Average household size of renter-occupied unit</td>
<td>3.75</td>
<td>(X)</td>
</tr>
</tbody>
</table>

### HOUSING STATUS

<table>
<thead>
<tr>
<th>Subject</th>
<th>#</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>OCCUPANCY STATUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total housing units</td>
<td>68,744</td>
<td>100</td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>69.2</td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>21,141</td>
<td>30.8</td>
</tr>
<tr>
<td>TENURE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>100</td>
</tr>
<tr>
<td>Owner-occupied housing units</td>
<td>36,092</td>
<td>75.8</td>
</tr>
<tr>
<td>Renter-occupied housing units</td>
<td>11,511</td>
<td>24.2</td>
</tr>
<tr>
<td>VACANCY STATUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacant housing units</td>
<td>21,141</td>
<td>100</td>
</tr>
<tr>
<td>For rent</td>
<td>676</td>
<td>3.2</td>
</tr>
<tr>
<td>For sale only</td>
<td>353</td>
<td>1.7</td>
</tr>
<tr>
<td>Rented or sold, not occupied</td>
<td>283</td>
<td>1.3</td>
</tr>
<tr>
<td>For seasonal, recreational, or occasional use</td>
<td>11,126</td>
<td>52.6</td>
</tr>
<tr>
<td>For migratory workers</td>
<td>14</td>
<td>0.1</td>
</tr>
<tr>
<td>Other vacant</td>
<td>8,689</td>
<td>41.1</td>
</tr>
<tr>
<td>RACE OF HOUSEHOLDER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>100</td>
</tr>
<tr>
<td>One race</td>
<td>47,404</td>
<td>99.6</td>
</tr>
<tr>
<td>White</td>
<td>1,906</td>
<td>4</td>
</tr>
<tr>
<td>Black or African American</td>
<td>53</td>
<td>0.1</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>45,266</td>
<td>95.1</td>
</tr>
</tbody>
</table>
## Navajo Demographics

<table>
<thead>
<tr>
<th>Race</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asian</td>
<td>44</td>
<td>0.1</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Some other race</td>
<td>131</td>
<td>0.3</td>
</tr>
<tr>
<td>Two or more races</td>
<td>199</td>
<td>0.4</td>
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</table>

### Occupied housing units

<table>
<thead>
<tr>
<th>HISPANIC OR LATINO HOUSEHOLDER AND RACE OF HOUSEHOLDER</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupied housing units</td>
<td>47,603</td>
<td>100</td>
</tr>
</tbody>
</table>

### AGE OF HOUSEHOLDER

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 24 years</td>
<td>1,719</td>
<td>3.6</td>
</tr>
<tr>
<td>25 to 34 years</td>
<td>7,569</td>
<td>15.9</td>
</tr>
<tr>
<td>35 to 44 years</td>
<td>12,349</td>
<td>25.9</td>
</tr>
<tr>
<td>45 to 54 years</td>
<td>10,123</td>
<td>21.3</td>
</tr>
<tr>
<td>55 to 64 years</td>
<td>7,276</td>
<td>15.3</td>
</tr>
<tr>
<td>65 years and over</td>
<td>8,565</td>
<td>18</td>
</tr>
<tr>
<td>65 to 74 years</td>
<td>5,219</td>
<td>11</td>
</tr>
<tr>
<td>75 to 84 years</td>
<td>2,513</td>
<td>5.3</td>
</tr>
<tr>
<td>85 years and over</td>
<td>833</td>
<td>1.7</td>
</tr>
</tbody>
</table>

### AGE AND SEX

<table>
<thead>
<tr>
<th>Age</th>
<th>Number</th>
<th>Percentage</th>
<th>Males per 100 females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
<td>180,462</td>
<td>88,469</td>
<td>91,993</td>
</tr>
<tr>
<td>Under 5 years</td>
<td>17,364</td>
<td>8,798</td>
<td>8,566</td>
</tr>
<tr>
<td>5 to 9 years</td>
<td>21,373</td>
<td>10,815</td>
<td>10,558</td>
</tr>
<tr>
<td>10 to 14 years</td>
<td>22,967</td>
<td>11,650</td>
<td>11,317</td>
</tr>
<tr>
<td>15 to 19 years</td>
<td>18,742</td>
<td>9,710</td>
<td>9,032</td>
</tr>
<tr>
<td>20 to 24 years</td>
<td>11,912</td>
<td>6,019</td>
<td>5,893</td>
</tr>
<tr>
<td>25 to 29 years</td>
<td>10,918</td>
<td>5,385</td>
<td>5,533</td>
</tr>
<tr>
<td>30 to 34 years</td>
<td>11,284</td>
<td>5,615</td>
<td>5,669</td>
</tr>
<tr>
<td>35 to 39 years</td>
<td>12,909</td>
<td>6,238</td>
<td>6,671</td>
</tr>
<tr>
<td>40 to 44 years</td>
<td>11,561</td>
<td>5,472</td>
<td>6,089</td>
</tr>
<tr>
<td>45 to 49 years</td>
<td>9,566</td>
<td>4,454</td>
<td>5,112</td>
</tr>
<tr>
<td>50 to 54 years</td>
<td>7,750</td>
<td>3,703</td>
<td>4,047</td>
</tr>
<tr>
<td>55 to 59 years</td>
<td>6,182</td>
<td>2,782</td>
<td>3,400</td>
</tr>
<tr>
<td>60 to 64 years</td>
<td>5,402</td>
<td>2,427</td>
<td>2,975</td>
</tr>
<tr>
<td>65 to 69 years</td>
<td>4,440</td>
<td>1,947</td>
<td>2,493</td>
</tr>
<tr>
<td>70 to 74 years</td>
<td>3,251</td>
<td>1,433</td>
<td>1,818</td>
</tr>
<tr>
<td>75 to 79 years</td>
<td>2,247</td>
<td>956</td>
<td>1,291</td>
</tr>
<tr>
<td>80 to 84 years</td>
<td>1,268</td>
<td>541</td>
<td>727</td>
</tr>
<tr>
<td>85 to 89 years</td>
<td>813</td>
<td>341</td>
<td>472</td>
</tr>
<tr>
<td>90 years and over</td>
<td>513</td>
<td>183</td>
<td>330</td>
</tr>
<tr>
<td>Under 18 years</td>
<td>74,030</td>
<td>37,572</td>
<td>36,458</td>
</tr>
<tr>
<td>18 to 24 years</td>
<td>93,900</td>
<td>45,496</td>
<td>48,404</td>
</tr>
<tr>
<td>25 to 34 years</td>
<td>18,328</td>
<td>9,420</td>
<td>8,908</td>
</tr>
<tr>
<td>35 to 44 years</td>
<td>46,672</td>
<td>22,770</td>
<td>23,962</td>
</tr>
<tr>
<td>45 to 64 years</td>
<td>22,202</td>
<td>11,090</td>
<td>11,120</td>
</tr>
<tr>
<td>45 to 54 years</td>
<td>24,470</td>
<td>11,710</td>
<td>12,760</td>
</tr>
<tr>
<td>55 to 64 years</td>
<td>28,900</td>
<td>13,366</td>
<td>15,534</td>
</tr>
<tr>
<td>69 to 84 years</td>
<td>17,316</td>
<td>8,157</td>
<td>9,159</td>
</tr>
<tr>
<td>75 to 89 years</td>
<td>11,584</td>
<td>5,209</td>
<td>6,375</td>
</tr>
</tbody>
</table>

Note: The table provides demographic data for the Navajo population, including the number of individuals by race, age, and gender, along with percentages and rates.
Navajo Demographics

<table>
<thead>
<tr>
<th>Age Group</th>
<th>65 years and over</th>
<th>65 to 74 years</th>
<th>75 to 84 years</th>
<th>85 years and over</th>
<th>16 years and over</th>
<th>18 years and over</th>
<th>21 years and over</th>
<th>60 years and over</th>
<th>62 years and over</th>
<th>67 years and over</th>
<th>75 years and over</th>
<th>Median age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>People (in thousands)</td>
<td>12,532</td>
<td>7,691</td>
<td>3,515</td>
<td>1,326</td>
<td>114,467</td>
<td>106,432</td>
<td>97,395</td>
<td>17,934</td>
<td>15,707</td>
<td>10,684</td>
<td>4,841</td>
<td>24</td>
</tr>
<tr>
<td>Percent of Total Population</td>
<td>6.9</td>
<td>4.3</td>
<td>1.9</td>
<td>0.7</td>
<td>63.4</td>
<td>59.5</td>
<td>51.2</td>
<td>9.9</td>
<td>8.7</td>
<td>5.9</td>
<td>2.7</td>
<td>(X)</td>
</tr>
<tr>
<td>Median Age (years)</td>
<td>6.1</td>
<td>4.7</td>
<td>2.2</td>
<td>0.9</td>
<td>62.2</td>
<td>57.5</td>
<td>52.2</td>
<td>8.8</td>
<td>7.7</td>
<td>5.2</td>
<td>2.3</td>
<td>22.6</td>
</tr>
<tr>
<td>Median Age Range (years)</td>
<td>7.8</td>
<td>4.7</td>
<td>2.2</td>
<td>0.9</td>
<td>64.6</td>
<td>60.4</td>
<td>55.7</td>
<td>11</td>
<td>9.7</td>
<td>6.6</td>
<td>3.1</td>
<td>(X)</td>
</tr>
<tr>
<td>Median Age Distribution</td>
<td>75.7</td>
<td>74.4</td>
<td>74.2</td>
<td>65.3</td>
<td>92.5</td>
<td>91.6</td>
<td>90.1</td>
<td>77.5</td>
<td>76.7</td>
<td>76.2</td>
<td>71.7</td>
<td>(X)</td>
</tr>
</tbody>
</table>
The Navajo Mountain chapter covers about 389,000 acres and is home to about 1300 residents. It has about 630 registered voters as of 1997. Navajo Mountain has 1 Navajo National Council delegate that is shared with the Inscription House chapter. It is part of the Western Agency. It is located southeast of Navajo Mountain and south of Lake Powell and is accessed by traveling north on Navajo Route 16. Route 16 is the closest paved road, and starts 24.5 miles from the chapter house. An estimated 31 family farms are located within the chapter.

Navajo Mountain is the most isolated chapter within the Navajo Nation. It is also one of several sacred mountains of the Navajo religion. Its summit is the highest point on the Navajo Nation at 10,388 feet above sea level.

The chapter is situated in Coconino and Navajo Counties in northern Arizona and San Juan County in southern Utah. This unique situation has caused some conflict within the chapter because of a lack of balance of funding between the states and counties.

Primary employers are the Bureau of Indian Affairs (BIA) boarding school, employing 37, and the Navajo Nation. The Chapter's largest community is Rainbow Village. It has a population of approximately 260 and is located in the shadow of Navajo Mountain.

Precipitation ranges from 8 to 28 inches annually, with more than half of the precipitation falling during the winter. Temperatures average from 45 to 57 degrees and the winters are cold. The growing season lasts between 110 and 180 days. The area's weather is affected by its proximity to Navajo Mountain and Lake Powell.
Location
The area surveyed was within San Juan County, Utah and was made in part in the Navajo Indian Reservation. This area borders Arizona to the south and Colorado on the east. The San Juan River is the boundary to the north. The western boundary is Lake Powell on the Colorado River. Deep gorges exist along the San Juan River and the Colorado River.

Five settlements or communities exist within the area, the first being established in 1906. The area became an official part of the Navajo Reservation in March of 1933.

Climate
The Sierra Nevada Mountains and the Rockies greatly influence the climate of the area. The Rockies provide a barrier against cold blasts from The Great Plains and the Sierras block much of the moisture from the Pacific Ocean. This results in a cool desert-like environment. The precipitation rate and humidity level are low and daily temperatures can fluctuate greatly. Much of the precipitation arrives from the Gulf of Mexico. Average annual rainfall is less than 10” except in upper elevations, however, precipitation rates vary widely over the survey area. The wettest period of the year is in early fall. Flash flooding is often a problem during this time.

Winters are cold with a minimum low of 0 degrees Fahrenheit or lower 30% of the year. Snowfall is usually less than 12” a year. Temperatures can exceed 100 degrees during the summer months though with a very low humidity. The average length of the growing season is between 140 and 200 days.
Navajo Mountain is one of several mountains held sacred by the Navajo people. It is the most prominent geological feature in the Lake Powell region. Its summit, reaching 10,338 feet above sea level, is the highest point on the Navajo Nation. The world famous Rainbow Bridge is located at the northwestern foot of the mountain. There are also other arches that are not well known, such as Owl Bridge and Hawkeye Bridge. Tourism is somewhat limited because of lack of paved roads, lodging and eating accommodations.

Navajo Mountain is located within climate zone 4, which is characterized by a semiarid climate with cold windy winters and warm dry summers. Winters are very cold with frequent but short storms alternating with sunny periods. Summer temperatures are high but humidity is low, so the diurnal temperature range is high and summer nights are generally cool. The average annual precipitation varies from 5 to 20 inches. Half the annual precipitation occurs in the four-month span from June to September. The mean average temperatures for the warmest and coolest months are 75 degrees F and 32 degrees F respectively. The daily maximum and minimum temperatures for July are 90 to 93 degrees F and 55 degrees F respectively. Average annual temperature ranges from 45 degrees to 55 degrees F. Average frost-free period is 100-200 days.

<table>
<thead>
<tr>
<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. High</td>
<td>45°F</td>
<td>48°F</td>
<td>51°F</td>
<td>59°F</td>
<td>68°F</td>
<td>79°F</td>
<td>82°F</td>
<td>79°F</td>
<td>74°F</td>
<td>65°F</td>
<td>53°F</td>
<td>46°F</td>
</tr>
<tr>
<td>Avg. Low</td>
<td>21°F</td>
<td>23°F</td>
<td>26°F</td>
<td>32°F</td>
<td>39°F</td>
<td>48°F</td>
<td>54°F</td>
<td>53°F</td>
<td>47°F</td>
<td>38°F</td>
<td>28°F</td>
<td>23°F</td>
</tr>
<tr>
<td>Mean</td>
<td>34°F</td>
<td>36°F</td>
<td>39°F</td>
<td>46°F</td>
<td>54°F</td>
<td>64°F</td>
<td>69°F</td>
<td>67°F</td>
<td>61°F</td>
<td>52°F</td>
<td>41°F</td>
<td>35°F</td>
</tr>
<tr>
<td>Avg. Precip.</td>
<td>1.80 in</td>
<td>1.80 in</td>
<td>2.20 in</td>
<td>1.10 in</td>
<td>0.70 in</td>
<td>0.50 in</td>
<td>2.90 in</td>
<td>3.00 in</td>
<td>1.80 in</td>
<td>1.50 in</td>
<td>1.90 in</td>
<td>2.10 in</td>
</tr>
<tr>
<td>Record Low</td>
<td>-25°F (1899)</td>
<td>-18°F (1932)</td>
<td>-6°F (1932)</td>
<td>2°F (1933)</td>
<td>8°F (1932)</td>
<td>22°F (1927)</td>
<td>32°F (1979)</td>
<td>11°F (1934)</td>
<td>7°F (1929)</td>
<td>-7°F (1931)</td>
<td>-17°F (1931)</td>
<td></td>
</tr>
</tbody>
</table>
Environmental Conditions

BASIC CLIMATIC CONDITION

- Comfortable period: 12%  
- Too hot: 11%  
- Too cold: 77%

TEMPERATURE

- Range of comfortable temp.  
- Afternoon maximum temperature  
- Average daily temperature  
- Morning minimum temperature

RELATIVE HUMIDITY

- Average morning humidity  
- Average afternoon humidity  
- Range of comfortable humidity

WIND SPEED

- Mean daily wind speed  
- Wind speed for effective natural ventilation  
- For wind direction see the wind roses on pages 42-45.

SUNSHINE

- Average % of daylight hours  
- Annual sunshine: %  
- Peak solar radiation in January  
  horiz. sq. ft. = 700. bluddyday  
  vert. sq. ft. = 700. bluddyday

DEGREE-DAYS

- Annual heating degree-days: 5502  
- Annual cooling degree-days: 381
The land withdrawal process is long and complicated, involving many steps. This process has been known to take up to several years.

In order for the tribal council to entertain a resolution requesting the withdrawal of land from tribal customary use land, the document must go through the following processes and review according to the tribe’s land administration office.

For any questions, Navajo Nation residents should contact BIA Realty or the Navajo Land Administration Office.
In order to be eligible for a Homestead Lease, you must be an enrolled member of the Navajo Tribe or a non-member that meets the requirements, 18 years of age or older, and your Homestead Lease must be for residential purposes only. In order to begin the Homestead Lease process, the applicant must first prepare an application for Homestead Lease. An updated Certificate of Indian Blood, obtained from the BIA Agency Census Office, must be attached. A Field Clearance form and must be prepared by and consent obtained from a Grazing Committee & Land/Farm Board member. The applicant must then go to the Navajo Land Department for their agency to pay a filing fee and turn in the Homestead Lease Application. The Homestead Lease application must be submitted to the nearest Navajo Land Department sub office, and a filing fee must be paid. A survey, legal description, and archeological clearance are required. The Homestead Lease can then be finalized by the Navajo Nation, Bureau of Indian Affairs (BIA), Southwest Title Plant and applicant. The BIA Regional Director or his or her designee must approve the Homestead Lease. The BIA Agency Real Estate Services office shall review each Homestead Lease application package to assure accuracy of the following items:

- Legal Name(s)
- Census Number, if applicable
- Location
- Acreage
- Survey Plat
- Archeological Clearance, if required
- Court Order, if transaction includes an assignment or modification of lease affected by probate, divorce or legal name change

The Homestead Lease package will then be forwarded to the Navajo Regional Real Estate Services Office for final approval. Upon final approval by the BIA Regional Director or his or her designee, the lease is returned to the BIA Agency Real Estate Services Office for distribution. After recordation at the Southwest Title Plant, BIA, Albuquerque, New Mexico, Land Titles and Records Office, the finalized lease is distributed to the lessee, the Navajo Nation, and the lessor.

Residents of the Leupp chapter may contact the Navajo Land Department sub office located in Tuba City, AZ for information on obtaining an application (928) 283-3194.
Process To Get Utilities

Approximately 35% - 45% of the residents in the Navajo Nation live without gas, electricity, water or wastewater of any kind. Navajo Tribal Utility Authority (NTUA) is trying to help inform residents of the procedures and steps they need to take in order to obtain the utilities they need for their homes. The NTUA has established a number of guidelines to guide Chapter Members through this process.

Step 1
Submit a Homsite Lease application to your local Navajo Land Department sub office. Residents of the Navajo Mountain chapter must submit to the Tuba City Sub-Office, PO Box 3309, Tuba City, AZ 86045, phone (928) 283-3194. They may also be contacted for further explanation of the utilities process.

Step 2
The Homsite Lease must be approved by the BIA Regional Director or his or her designee. The BIA Agency Real Estate Services office shall review each Homsite Lease application package.

Step 3

- Approved Homsite Lease
- Home Set-Up

**NTUA OFFICE**

- Submit Application
- Survey Estimate & Right-of-Way Letters
- Payment Arrangement

10 working days - Process for Construction
10 - 15 working days - Install Utility Line
Hook up Meters

OR

- Community Chapter - Housewiring Project
- House
- Chapter Resolution
- Submit Affidavit
- Inspection
- Correction
- Pass Inspection

1 year - Right-of-Way Process/Navajo Nation/BIA
2 years - (NN) Funding Sources
JPA/MOA (Payment Arrangement)
- Construction
- Hook up Meters

*NTUA must comply with all federal and Navajo Nation laws & regulations regarding right-of-ways and land use.
If a resident is interested in solar power for their home, they can contact their district office of the NTUA. They are required to have a Homesite Lease and proof of income. A house wiring certificate is required for a house, but not for a mobile home. The cost of the system can be financed at about $95.00 per month for a contracted length of time with interest of 7.5% (as of 6/26/01). If the resident pays for the unit all at once, they can sign up for a maintenance contract. There are only a certain number of systems available throughout the Navajo Nation, including some systems that have been refurbished, which may be available at a lower cost.
One-half of all Native Americans live on reservations.

Fully 40 percent of existing homes on reservations are substandard.

An estimated 210,000 Native American families are in immediate need of housing.

Native Americans have had difficulty obtaining mortgages because tribal lands are in trust to the federal government and cannot be used as collateral for loans.

Habitat for Humanity International is a nonprofit, non-denominational Christian housing organization. Since 1976, Habitat has built more than 100,000 houses in more than 60 countries, including some 30,000 houses across the United States. Habitat houses are purchased by the homeowner families. Three factors make Habitat houses affordable to low-income families worldwide:

Houses are sold at no profit, with no interest charged on the mortgage.

Homeowners and volunteers build the houses under trained supervision.

Individuals, corporations, faith groups and others provide financial support.

Habitat for Humanity's work is organized at the local level by more than 1,900 affiliates worldwide. Affiliates coordinate house building and select partner families. Homeowner families are chosen according to their need; their ability to repay the no-profit, no-interest mortgage; and their willingness to work in partnership with Habitat. Habitat for Humanity does not discriminate according to race, religion or ethnic group.

The Native Peoples' Initiative (NPI) is a Habitat for Humanity program that seeks to make homeownership a reality for Native Americans, Native Hawaiians and Native Alaskans. The program follows the guidelines of the typical Habitat house. In addition to a down payment and monthly mortgage payments, homeowners invest hundreds of sweat equity hours into construction of their own, or of someone else's, home. The NPI also implements financial management training for new Native American homeowners. In this way, Habitat has been strengthening communities with Native Americans since 1988.

Habitat for Humanity is fostering positive relationships between native and non-native communities while working with tribal communities to develop housing that is compliant with native culture and its value of environmental sustainability. Last year, ten Habitat affiliates in eight states received $300,000 in grant funds to work with Native Americans in their respective communities. Those affiliates are now partnering with Native American homeowners.

Affiliates located on tribal lands
Cheyenne River, Pine Ridge and Rosebud Indian Reservations, S.D. (Lakota)
Crow Creek (Dakota)

Affiliates working with tribal communities
Bells Flats Natives-Kenai Village, Alaska (Dena’ina – Athabascan)
Pascua Yaqui Indian Reservation, Ariz.
Native Hawaiians Homelands-Honolulu, Hoolehua and Lihue’e, Hawaii
Menominee and Stockbridge-Munsee Reservations, Wis.
Those who are interested can get involved with the Native People's Initiative by:
- Volunteering with one of Habitat's NPI projects
- Talking to their tribal government or housing authority about Habitat
- Starting a Habitat affiliate on their reservation
- Inviting a Habitat representative to their tribal college or tribal meeting
- Donating building materials, land or funds to Habitat for Native American families
- Working and praying for the elimination of poverty housing.

Contacting their office at (363) 893-9971, or by mail - Native Peoples' Initiative, P.O. Box 40787, Denver, CO 80204. Director Darius Smith can also be reached by email - dsmith@hfhi.org.
Home design in arid regions should strive to minimize or eliminate the discomfort and stressful conditions created by the climate. In any environment whether it is an interior or exterior space there is a comfort zone for the occupants of the space. Generally speaking to obtain the comfort zone for most individuals the humidity needs to be between 20% and 80% and a temperature of 68 – 78 degrees Fahrenheit should be maintained. As the temperature and humidity levels change so do the levels of comfort. Outside, changes can be made with landscaping to alter the humidity levels to bring individuals into the comfort zone. The goal should be to increase heat loss during the day but encourage heat gain at night. Homes using passive solar design incorporate the natural movement of air and heat to reach comfortable temperatures year round, using little or no mechanical assistance. It takes advantage of breezes, natural shade, and windbreaks, and naturally collects and stores heat. There are several basic principles that are used in passive solar design – orientation, overhangs and shading, insulation, windows, and thermal mass. Some of these principles must be incorporated during new construction. Others can even be applied to existing homes to improve energy efficiency. A well designed passive solar home uses common construction materials combined in different ways to reach the desired effect. Passive solar homes save the inhabitants money in the long run by lowering utility costs, but add little or no cost to the initial construction.

Orientation and placement
When sunlight falls on a home, it is converted into heat. Therefore the purpose of passive heating and cooling is to bring more sunlight into the home in the winter and keep it out in the summer. Long rectangular buildings, oriented so their longer sides face to the south, absorb heat from the low winter sun. This is achieved by orienting the ridgeline east/west. Remember, though, that solar south is different from magnetic south, and the south wall can be as much as 30 degrees east or west with a minimal decrease in efficiency. The rooms that are used frequently should be placed along the southern exposure of the building, so sunlight can come through the windows. Rooms with low heat and light requirements, with infrequent use or that generate high internal heat (kitchen) can be placed on the north side. By simply orienting the building this way and properly placing windows, a building’s total energy use can be cut by 30 to 40 percent at no initial extra cost.

The homeowner can take advantage of even more benefits by strategically locating the home on the site. For example, by placing the home on the south face of a hill, the home is
naturally more warm and sunny than if placed on the cold and shady north face. Tops of hills are very windy, and valleys are much cooler than flat areas.

Thermal mass
If heat is needed when the sun is not shining, then extra heat must be stored up while it is shining. Thermal mass is a solid material that absorbs warmth or coolness until it is needed. Thermal mass, like concrete or masonry, has a much better capacity for storing warmth or coolness than the surrounding air. This prevents large changes of indoor temperature, even as the outdoor temperature rises or falls. In the winter, the thermal mass absorbs direct sunlight during the day and warms the room through the night as the process is reversed. In the summer the thermal mass should be shaded so it draws warmth from the interior air and cools the room. For thermal mass to be fully effective, air must be freely circulated throughout the home to carry the warmth to where it is needed. Natural convection or fans may circulate the air sufficiently. Thermal mass can be used in many forms, from brick, tile or concrete floors, to interior brick or stone fireplaces, to interior walls made of adobe or brick. A masonry or concrete wall can be used to absorb heat if it has southern exposure and receives direct sunlight. The ideal thickness for mass materials is 4 to 5 inches.

Windows
The placement of windows and doors in relationship to wind, landscape and sun can increase a home’s comfort and efficiency. The use of windows in conjunction with an attic fan optimizes natural ventilation to cool a home. Locating windows opposite each other encourages cross ventilation. Windows can act as solar collectors, bringing in light and heat while providing ventilation. By locating most of the home’s windows and glass doors on the south side, warm solar energy can be collected when heat is needed, and cool breezes let in when cool air is needed. The amount of glazing, however, must be balanced with the amount of thermal mass in order to prevent the home from being too hot or too cold. A window’s insulating ability is measured by its U-value, where a lower number reflects a higher insulating value. The material of the frame may also contribute to or detract from its insulating value. Low-E coatings are also available, placed on the interior of the outside pane in cooler climates and on the exterior of the inside pane in warmer climates, to reduce the heat emitted through the glass panes. In warmer climates, north-facing windows provide daylighting without allowing much heat in. In order to control nighttime heat loss in winter and daytime solar gain in summer, insulated shades or shutters can be installed.

Overhangs and shading
Placing windows on the south exposure allows lots of warm sunlight into the home in the winter, but also in the summer. That is why shading with overhangs is essential to providing year round comfort. It is very important that the overhangs are properly sized, so that in the summer when the sun is high, no sunlight comes in the windows, but in the winter when the sun is lower, light will come into the space. Shading can also be provided with drapes, shutters, interior or exterior shades, awnings and landscaping. Properly placed deciduous trees can block
summer sun on the south, east and west, but in the winter when foliage is gone they allow sunlight to permeate. By shading eastern and western windows with landscaping, the temperature inside the home can be lowered up to 20 degrees. Vertical shading or louvers are also helpful for eastern and western windows. Large trees can also lower roof and attic temperatures by blocking direct solar gain.

Variation of surfaces
By varying the surfaces of walls, ventilation and air turbulence are encouraged by breaking up the plane that the wind travels over and diverting the air into the buildings. Variation of the roof also reduces the absorption rate of radiation through the roof.

Insulation
Having a home without insulation is like leaving windows and doors open all the time. Materials that are good insulators are poor conductors of heat, so they form thermal barriers between interior and exterior spaces. Well-insulated homes can maintain a comfortable temperature year-round using less mechanical heating or cooling. Ideally, every wall between the exterior and interior spaces should be insulated, including walls, floors and ceilings. A homebuilder has many choices for insulation, such as loose fill, batts, rolls, foam-in-place or rigid board.

Passive solar homes work best when all these design features are balanced. Adjustments can be made in passive systems to provide comfortable temperatures. Windows can be covered to varying degrees to change the amount of heat gained or lost. Doors and windows can be opened to allow natural breezes into the home. Ceiling fans also help circulate air. A passively designed home requires less use of its mechanical heating and cooling systems, saving the residents money on utilities and repairs. It also makes life easier by working for the homeowner, instead of the homeowner always working for it.

The ancestral pueblo people of Betatakin and Keet Seel took advantage of the same principles used in modern passive solar design. Both settlements were built on bedrock ledges of southern facing canyon walls. The cave provided protection from the heat of the high summer sun. In the winter, the village was warmed all day by the low sun. Thick adobe walls provided natural thermal mass, to hold warmth in the winter and provide coolness in the summer. Small windows minimize heat loss and are easily covered.

Energy Saving Tips for the Home
There are some steps that can be taken, in any home, in order to reduce energy use and to save on utility costs. The following list describes minor changes that can be adopted in daily life.

No cost tips
- Set water heater to 120 degrees F
- Clean refrigerator coils
- Set refrigerator to 36-39 degrees F
- Set freezer to 0-5 degrees F

Winter tips
- Turn thermostat down 10 degrees F at night or when leaving for more than 4 hours
- Keep curtains open on south side of house during the day
- Keep curtains closed on north windows

Summer tips
- Close curtains on the sunny sides of home
- Turn off furnace pilot light
- Open windows on cool sides of home
- Use fans to circulate air in the home
Low cost tips
Insulate water heater
Caulk inside of doors and windows
Replace furnace filter every month in winter
Replace light bulbs with compact fluorescent bulbs
Mercy Housing is a non-profit corporate ministry sponsored by congregations of Catholic women that works to respond to concerns for housing justice for the economically poor. Their mission is to create and strengthen healthy communities by providing quality affordable housing. Mercy Housing Southwest currently owns and operates numerous apartment complexes and a smaller number of single-family homes. They also provide some units for senior citizens or residents with special needs. Within the multi-family housing, community spaces are provided to serve as a gathering place for meetings and events. In some cases, computers, a library, or childcare are provided, depending upon the needs of the community. Leadership Training, Residents Councils, and ongoing education for employees are provided to help develop a healthy community.

For more information, contact Mercy Housing SouthWest – Mercy Housing System
Stephen L. Hastings – Vice President – shastings@mercyhousing.org
Jeanne Skerrett Redondo – Housing Developer
222 W. Thomas Road, Suite 214
Phoenix, AZ 85013
(602) 406 7736 phone
(602) 406 4119 fax
A lot of young people want housing, and many people who live on the outside want to house in the chapter. Many people have signed up for housing and many more want to but have never formally expressed this interest.

A lot of times when we plan there will be plans to expand and then the landowners do not agree.

Mainly for our kids and grandkids which is good and that is good.

Very few people are involved in the planning process and as things are implemented everyone starts speaking up.

Likes the idea of organized planned growth.

Housing – rainbow city is a growth center, chapter house area.

Because the chapter is located in 3 different counties, it is difficult to make decisions without the entire community getting together and talking.

Put a halt to any more communications on top of Navajo Mountain. It is very sacred.

Resort sounds good but needs to be relocated because it is too far.

In Piute Canyon people are already towing boats to launch into Lake Powell.

Need to get back to the original chapter boundary.

Lack of water in the southern portion has halted the development even though the land has been Withdrawn.

Rainbow city has the most growth, plenty of water.

Main water is coming from a spring on north side of mountain (Beaver Springs?).

Going to drill water well in Piute Canyon that will also be piped into the lower regions.

Courts ordered all other agencies that were involved with the school to make sure there was enough water. This overflowed into the surrounding community.

2 or 3 plans to get more water to school, more wells, pipe up from inscription house to the mesa.

The LLUPA is going to find out how many houses have plumbing but not any water, full plumbing, partial plumbing, no plumbing at all. They will be the first in receiving the water lines.

They would like a visitor's center in the high mesa, possibly a hotel.

New businesses can work with the land use planning committee.

Water and electricity are the main focus.

Existing cluster subdivision has had social problems: gangs parties marital problems – after talking with them they do not want clusters.

Have clusters of no more than 4 or 5 homes at a time show scattered clusters and town like clusters.

Senior citizens would like to group home now they have to go to Phoenix, Farmington etc Community can care for their elders in the community.
There are currently no paved roads in or surrounding Navajo Mountain. Provision of a paved road connecting Navajo Mountain with Kayenta would cut driving time in half.

A new subdivision would be possible in the Rainbow City area. The houses and utilities that run to the edge of the canyon will have water and electric service. This housing tract will encompass 75 acres.

People within the Navajo community tend to want a certain amount of privacy, so duplexes and apartments, as well as small lots, are not desirable.

There are currently no local contractors or builders in the area.

Navajo Mountain has a new school built in 1998, located in Arizona and built on 22.5 acres bought from the tribe. The school, which employs six teachers, is currently attended by about 30 students. The school buses are not allowed to cross the state line, so students who live in Utah are met by the bus at the state line. Long distance learning is currently available in Navajo Mountain, which allows students to earn college credits or attend community college in Kenya, Tuba City or Page. Bill Gates has also set up a program to provide computers to members of this chapter. A satellite community college is wanted in Navajo Mountain. Community leaders would like for more young people to stay in or return to the area, but because of the distance to the surrounding towns, most leave the chapter as soon as they are able to.

The Chapter members are in need of a new Chapter House to accommodate offices, meeting rooms, and other community facilities.

The people of Navajo Mountain have requested some facilities in their community, including a post office, a grocery store, a gas station, a Laundromat and a restaurant/motel. The nearest community that has these facilities is Kayenta, which is an hour away. Residents also visit Page and Cortez for these facilities. The development of a new commercial area would encompass the building of roads, the cost of handling and maintaining vehicles, and preparing the area for commercial and retail.

Tourism accounts for 90% of all income made within Navajo Mountain, although most people do not work within Navajo Mountain and travel to other towns. There is a landing strip, but the residents would like to add a heliport also. This would allow for easier travel for tourists. A helicopter would also allow hikers to be taken out to other interesting hiking and horseback riding locations, including lookouts, scenic points and canyons.

The Navajo nation would like to provide a pavilion for outdoor meetings and a tourist facility that would host many activities, including hiking, horseback riding. The state is also in support of the addition of some sort of resort. The addition of these tourist facilities would provide new jobs not only in construction, but also in the operation of the facilities.

The original proposed resort is in zone 1 for fish and wildlife. This means that any new construction in the area must have fish and wildlife approval. Elmer Clark said we could probably work something out if we give him documentation.

There are possibly some Piute lands located in or near Navajo Mountain Chapter. We can talk to Roman Bitsue 871-6441 at the Navajo Hopi Land Commission Office.

We talked with Elmer about some sort of Fish and Wildlife Clearance, much like Archaeological Clearance.

They are also concerned about washouts and drainage problems with roads.
Jobs are good especially for the young they will, will need that in order to stay and for the chapter to continue to grow and flourish.

WATER COMES FIRST!!!!!!!

Group home within the valley where the chapter house is located, they have the old BIA school with 90 approx. acres. Have clinic close by with lots of elderly near by.

Other locations would be along the road coming in, waterline will probably follow it.

They would like a possible veterinarian service.

Something that can be used year around, retreats for kids, pavilions, fairgrounds rodeo.

Grants to revitalize preserve some of the farming areas irrigation.

Lands are withdrawn for grazing and shown on the map.

Navajo Mountain does not have running water through out the community and the best potential source for running water will be from siphoning springs. The pumps can be powered by using solar panels for an inexpensive year round fuel source. The addition of storage tanks in various areas will allow for a reservoir of water to be available when needed. The many springs in the area will work well to provide plenty of drinking water for Navajo Mountain residents. Possible water sources include Tall Mountain Spring, Piute Canyon or Lake Powell. The quality of water available from Piute Canyon is questionable so a filtration plant would probably be necessary. The water that is used currently comes from Navajo Mountain. The Deep Canyon area has an ample supply of water right now.

There are dividing boundaries within the chapter, both physical and political, which must be considered in addressing the issue of water supply. These boundaries will not allow water to be transferred from state to state or from county to county. There are also natural physical divisions, like mountains and ridges, which could also make transferal of water difficult.

The possibility has also been mentioned that one of the rivers could be dammed to form a lake. This would not only provide a source of water for public use, depending upon the size and location, could provide some amount of hydroelectric power. Pipelines will need to be placed in or near valleys to tap the water supply from local rivers to supply irrigation for the grasslands. The irrigation of grassland areas will allow for the renewal of natural vegetation, providing food for the grazing herds occupying the chapter and helping to control erosion.

One of the biggest problems concerning water is that surface water soaks up water quickly. Wells that are dug come up empty soon thereafter.

There was an attempt to drill near old windmill but funding was lost because of political reasons. Drilling was completed to about 175 feet although 3000 feet was the goal.

There is currently no power in the area. Many homes, especially in the Piute Mesa area, have receptacles and lights, but no connection. Most of these homes have been waiting for electricity for years. The installation of solar panels at various locations could provide power at a low cost for many people and could be executed very quickly, although it would involve fairly high initial cost. They could be installed on the roofs of homes, especially those that are farther away and where it is not feasible to run actual electric lines to the homes.

The people of Navajo Mountain currently use generators for small amounts of power, propane for cooking and heating ($1.50 per gallon), and firewood ($65 for a cord) and coal ($45, ½ ton, 2 times/winter) for heating.