

# **Land Use Plan for Twin Lakes Chapter**

*Final Report*

*December 2001*



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In association with:  
**Twin Lakes Comprehensive Land Use Planning Committee**

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*This section explores:*

- *The purpose of the chapter planning initiative*
- *The Local Governance Act*
- *NAHASDA*
- *The chapter planning process.*

### **1.1 Purpose of Chapter Planning Initiative**

The Purpose of the Land Use Plan for Housing is to provide a guide for future housing and commercial development in the Twin Lakes Chapter. This document will provide long-range guidance to the Chapter through the identification of the most suitable sites for housing development as well as sites for other community needs. The recommendations provided by this document are based on a careful assessment of the housing, community development and facility needs of the Chapters, an assessment of infrastructure needs and capabilities and the suitability of the sites for development. It is intended to function as a working resource for the Chapter's land use planning committee in its effort to plan effectively and appropriately for the future. While future development of housing and commercial activities should comply with the recommendations of the plan, the nature of this document is one of flexibility and adaptability to local and regional changes.

The development of the Twin Lakes Chapter Land Use Plan for Housing is driven by the 1996 NAHASDA legislation, which has provided the funding for this plan for housing, and by the Local Governance Act. This Act sets forth a process by which, through the development of a land use plan, local chapters are given authority to administer their land.

*The Local Governance Act (LGA) grants Chapters authority over local issues relating to economic development, taxation and revenue generation, infrastructure development, and land use planning.*

### **1.2 Local Governance Act**

The Local Governance Act (LGA) grants Chapters authority over local issues relating to economic development, taxation and revenue generation, infrastructure development, and land use planning. By assisting Chapters in becoming self-governing entities, the LGA creates opportunities for the improvement of the Chapter members' quality of life by:

- developing opportunities for economic development,
- conserving natural resources and preservation of Navajo heritage and culture,
- ensuring government accountability,
- creating an atmosphere of experimentation and learning, and
- developing experienced, professional administrators.

The LGA sets forth a process by which local chapters are granted power over local issues. As part of this process, Chapters must adopt a *Five Management System* which sets up policies and procedures for Chapter administration of personnel, property, procurement, accounting and record keeping.

Chapters must also develop and adopt a comprehensive, community-based land use plan, which grants local chapters the authority to administer their land. This comprehensive plan, according to the LGA, section 2004 (B), is based on "the guiding principles and vision as articulated by the community; along with information revealed in inventories and assessments of the natural, cultural, human resources, and community infrastructure." The LGA also states that such a plan shall include "a land use plan which projects future community needs, shown by location and extent, areas to be used for residential, commercial, industrial and public purposes." While the main intention of this plan is to develop a land use plan specific to housing, the information presented in this plan will also provide technical and informational support to the Chapter in the development of the comprehensive land use plan.

*The Native American Housing Assistance and Self-Determination Act of 1996 (NAHASDA) reorganized the system of federal housing assistance for Native Americans and has provided the funding for this planning effort.*

### **1.3 NAHASDA**

The Native American Housing Assistance and Self-Determination Act of 1996 (NAHASDA) has provided the funding for this planning effort. NAHASDA provided \$86 million to the Navajo Nation for the first year and \$88 million in the second year for the purpose of planning for and constructing housing. Three additional years of funding are anticipated. In total, \$1.2 million has been set aside for 30 Chapter Plans, with the possibility of more funding for additional Chapter Plans in subsequent years.

NAHASDA reorganized the system of federal housing assistance for Native Americans. It replaced several housing assistance programs with one block grant program that recognizes the right of Indian self-determination and tribal self-governance. The guiding principals of NAHASDA state that public housing programs modeled for urban America should not be forced on Native America, and that local communities should be financially assisted in developing private housing and capital opportunities, so that they may have

*There are three phases involved in this Chapter planning process:*

- *Community Assessment*
- *Infrastructure Analysis*
- *Suitability Analysis.*

the flexibility to devise local solutions for local problems.

#### 1.4 Chapter Planning Process

There are three phases involved in this Chapter planning process, all culminating in a final Chapter Land Use Plan (Exhibit 1).

The first phase involves a community assessment. The community assessment evaluates individual Chapter community needs such as housing, economic development and community facilities.

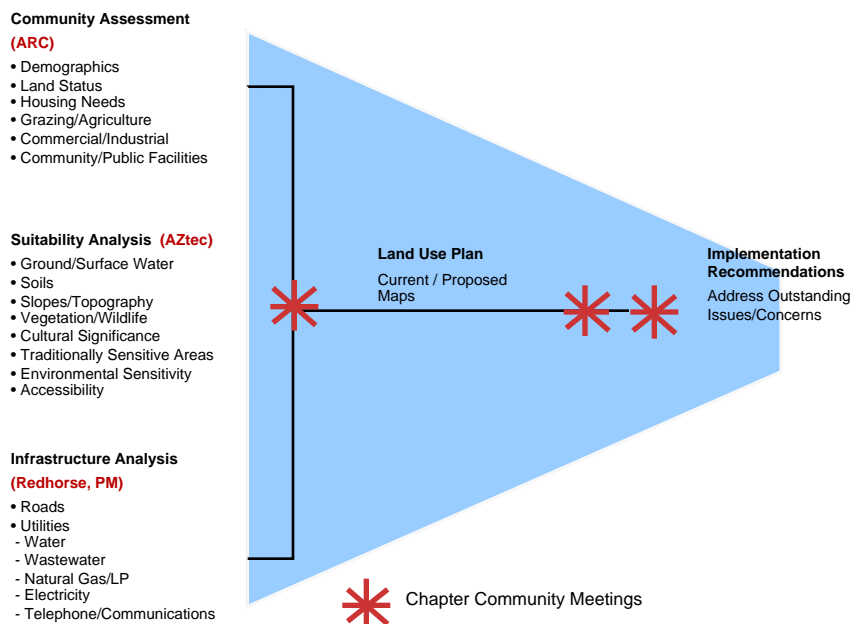
The second phase includes an infrastructure analysis. The infrastructure analysis considers transportation and utilities needed for development to occur.

The third phase of the planning process includes a suitability analysis. The suitability analysis examines the natural and cultural resources and environmental constraints affecting development.

The final product will be a chapter plan that identifies the most suitable housing development sites, as well as sites for other community needs.

#### Typical Planning Process for Individual Chapters

*Exhibit 1: Planning Process*



*The Community Assessment section addresses the following topics:*

- *Chapter Background*
- *Socio-economic Trends*
- *Housing Needs*
- *Land Status*
- *Grazing Uses*
- *Commercial/Industrial Uses*
- *Community Facilities.*

*As early as 1929, there was some settlement in the area between two lakes. It is because of these seasonal lakes that the Chapter was named “Twin Lakes” in English. The community is better known as Bahastlah in Navajo.*

*In approximately 1930, the community of Twin Lakes began to form with the construction of a government day school.*

*In the early 1940s, people began moving from the foothills to the open areas near U.S. 666. A Chapter house was built in 1942, making it the second oldest Chapter on the Navajo Reservation. It was certified on February 14, 1956.*

The Community Assessment section addresses the following topics:

- Chapter Background, including history and planning issues and goals
- Socio-economic Trends
- Housing Needs
- Land Status
- Grazing Uses
- Commercial/Industrial Uses
- Community Facilities.

## **1.0 Chapter Background**

### **1.1 History**

As described in *Chapter Images (1996)*:

As early as 1929, there was some settlement in the area between two lakes. It is because of these seasonal lakes that the Chapter was named “Twin Lakes” in English. The community is better known as *Bahastlah* in Navajo than *Tse nahnzoh*; however, neither of these Navajo names are relevant to the English name ‘Twin Lakes’. As in most parts of Navajo country, people in those early days lived in more remote areas because they were heavily dependent on livestock raising. Over the years, as communities started to grow and better roads were built, people started moving closer to these settlements.

In approximately 1930, the community of Twin Lakes began to form with the construction of a government day school. This school was expanded in 1938; more classrooms were added to accommodate up to 300 children.

In the early 1940s, people began moving from the foothills to the open areas near U.S. 666. The growing community brought in electrical power lines. A Chapter house was built in 1942, making it the second oldest Chapter on the Navajo Reservation. It was certified on February 14, 1956. Prior to this first Chapter house, people met at the school’s boarding house living room, which could accommodate up to 60 people. The current Chapter house was built during the early 1960s.

*The major community issues include:*

- *Housing needs*
- *Education facilities*
- *Land disputes*
- *Loss of open space*
- *Infrastructure needs*
- *Environmental concerns.*

*Chapter planning goals include:*

1. *Promote job opportunities for community members*
2. *Develop revenue sources for the chapter*
3. *Provide educational facilities and opportunities*
4. *Provide services to youth and elderly*
5. *Provide health care and public safety facilities*
6. *Provide other community facilities.*
  - *New chapter house*
  - *Post Office*
  - *Rodeo arena*
7. *Provide safe and adequate housing*
8. *Provide all-weather roads to housing areas*
9. *Provide bus service to employment and education centers*
10. *Provide solid waste services*
11. *Upgrade existing utility services.*

Currently, the community core of the Chapter area has 65 NHA units situated east of the Chapter house. Also in the immediate community is the Twin Lakes Elementary School, a preschool, a warehouse, and several other non-NHA family clusters of homes.

## **1.2 Community Issues**

A number of community issues have been identified:

- Need for additional housing
- Need community and higher education facilities
- Different versions of Chapter boundaries (grazing boundaries vs. voting and census boundaries); northern boundary issue with Mexican Springs
- Conflicts over grazing areas
- Overcrowding
- Need for infrastructure improvements
- Clean up hazardous waste site at Bass Lake Dip Vat, 5.4 miles southeast of Coyote Canyon.

## **1.3 Chapter Planning Goals**

Community planning goals are as follows:

### **1. *Promote job opportunities for community member***

- Develop commercial businesses
- Improve bus system to include evening hours.

### **2. *Develop revenue sources for the Chapter***

- Hotel
- Retail center
- Gas station/truck stop
- Arts/Crafts center.

### **3. *Provide educational facilities and opportunities within the community***

- New preschool
- Improvements to the Twin Lakes Elementary School
- New higher education facility
- Library.

### **4. *Provide services to youth and the elderly***

- New senior center
- Youth/recreation center
- Daycare.



**5. *Provide health care and public safety facilities***

- Clinic
- Nursing facility
- Police and fire substation.

**6. *Provide other community facilities.***

- New Chapter house
- Post Office
- Rodeo arena.

**7. *Provide safe and adequate housing for all community residents.***

- Renovations and bathroom additions
- New housing for community members, with a priority for scattered housing, then clustered housing, and then subdivisions.

**8. *Provide all-weather roads to housing areas throughout the community.***

- Pave Jack Johnson, Bass Lake and Sherman Roads
- Pave Mexican Springs Road (N30, Scenic Byway) scheduled FY2001
- Replace bridge over Fiquerdo Wash (N9504) scheduled FY2000
- N9 (pavement in severe condition) to Coyote Canyon is scheduled for resurfacing - FY2000.

**9. *Provide bus service to employment and education centers.***

- Currently served by Window Rock - Shiprock route.

**10. *Provide solid waste services***

- Transfer station
- Landfill.

**11. *Upgrade existing utility services***

- construct a new sewer lagoon(s).

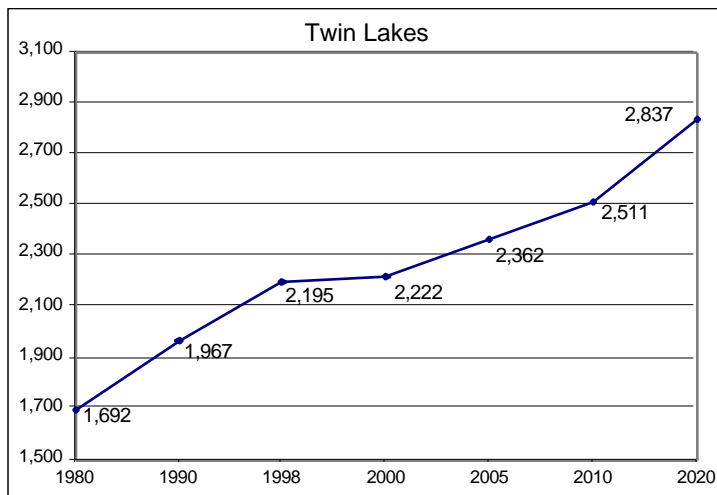
**12. *Provide for customary land use in the Chapter area including farming and grazing.***

- Develop irrigated areas near proposed San Juan water pipeline
- Farm co-op center.

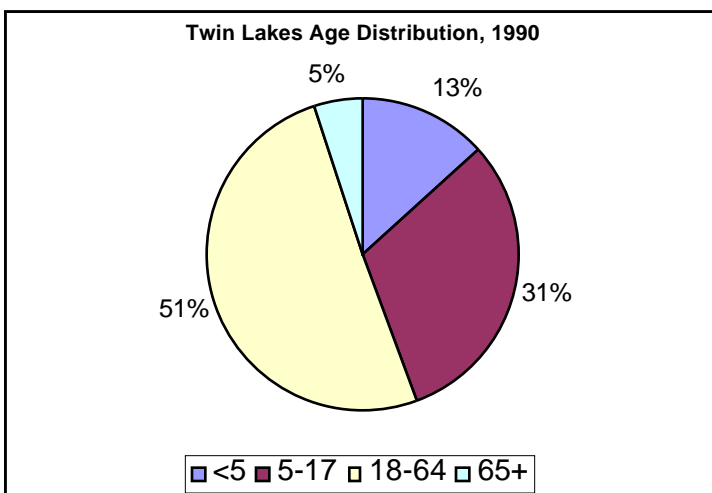
*Twin Lakes Chapter has increased in population from 1,952 in 1990 to 2,195 in 1998. Population projections indicate the Chapter will grow to 2,837 in 2020.*

*The Twin Lakes population is young, with more than 40% under age 18.*

**Exhibit 2: Population Growth**



**Exhibit 3: Age Distribution**



## 2.0 Community Socio-Economic Trends

### 2.1 Population Trends

Population trends are used to determine housing and community facility needs over the next ten to 20 years (Exhibit 2). Population trends are as follows:

- Approximately 99.2% of residents are Navajo or Native American; and the remainder white or unspecified (1990 U.S. Census).
- Twin Lakes Chapter has increased in population from 1,952 in 1990 to 2,195 in 1998. McKinley County had a population in 1990 of 56,540 persons and has a current (1998) estimated population of 67,600.

- ARC estimates 2,300 population currently.
- Population projections indicate Twin Lakes Chapter will grow to 2,222 in 2000 and 2,837 in 2020. McKinley County is projected to grow to 72,170 in 2000 and 81,670 in 2010.

### 2.2 Demographic Characteristics

Age characteristics (Exhibit 3) of Twin Lakes Chapter are as follows:

- 13% of the population is under age 5
- 31% is aged 5 to 17
- 51% is aged 18 to 64
- 5% is age 65 and over.
- The population is generally younger on the reservation than elsewhere in the state. The median age in 1990 for the Navajo Nation was 22.7 as compared to 25.4 for McKinley County and 31.3 for the state of New Mexico.

*Most residents work in Gallup and Window Rock. Most jobs are in the government, trade, mining, and services sectors.*

*Unemployment is high and incomes are low.*

## 2.3 Employment and Income

Most Twin Lakes residents work in Gallup and Window Rock. Most jobs are in the government, trade and services sectors (Exhibit 4). The major Twin Lakes area employers are the Chapter, including Headstart and the Navajo Nation, the Twin Lakes Elementary School, and the Tohlokai Convenience Store. The Pittsburg & Midway McKinley Mine is another major nearby employer and is in the third year of a ten-year phase out. Eventually, 600 jobs will be eliminated.

Other economic trends include the following:

- The unemployment rate in 1997 for Ft. Defiance Agency was 37.2%, 45.8% for the Navajo Nation and for 9% McKinley County (Navajo Nation Economic Development, 1997).

*Exhibit 4: Employment by Sector*

<b>McKinley County Employment by Sector</b>	
Agriculture	-
Mining	-
Construction	763
Manufacturing	577
Transportation, Communication, Utilities	864
Wholesale & Retail Trade	5,887
Fire Insurance and Real Estate	827
Services	4,540
Public Administration	6,606
	<hr/> 20,064
(Source: U.S. Census)	

- More than 50% of the Navajo families on the Reservation live below the federal poverty levels, compared with less than 13 percent of the general U.S. population. (Navajo Nation Economic Development, 1997).
- In 1990 the median family income was only \$11,885 while the U.S. median family income was more than \$30,000. Per capita income for the Navajo Nation in 1990 was \$5,600 as compared to \$11,870 for McKinley County and \$19,250 for New Mexico (Navajo Nation Economic Development, 1997).

- An informal economy exists on the reservation which is not measured. Arts, crafts, and food vendors sell rugs, jewelry and other goods at roadside stalls and to traders off-reservation. For the U.S., as much as 35% of income is unreported, indicating that income may be higher for the Navajo Nation. In addition, a traditional subsistence economy based on livestock grazing and farming also continues for many families. (Navajo Economic Development, 1997).
- Only 49% of reservation income is derived from wages and salaries. 42% is derived from social security, retirement benefits, welfare and general assistance. The remainder is self-employment, interest/ dividends and other sources (Navajo Nation Transportation Plan, 1998).

#### **2.4 Leakage**

Leakage of Navajo Nation income and revenue outside the reservation is a serious problem. Only about 40% of income is spent on the reservation (Navajo Economic Development, 1997).

#### **2.5 Education Levels**

For McKinley County, 58.5% of the population are high school graduates and 11.1% have a college degree. For the Navajo Nation, 43.5% have a high school diploma and 5.5% have graduated from college.

### **3.0 Housing Needs**

Existing and proposed housing are described in this section and are listed in Exhibit 8 and shown in Exhibits 9 and 10. Existing and proposed housing sites are also shown on the enclosed large scale map in the pocket of this report binder.

#### **3.1 Existing Housing**

The U.S. Census reported 631 total housing units in Twin Lakes Chapter in 1990. Of these, 71.9% were occupied. The other units were seasonal units, vacant due to family members living closer to employment, or uninhabitable. Of the total occupied, 90% of units were owned and 10% rented. Of total units, 56.1% of units were single family, 7.9% multi-family, and 21.7% mobile homes.

*In 1990, the U.S. Census reported 630 houses in the community. About 72% were occupied, most single family, and most occupant-owned.*

*A 1997 estimate found 495 occupied houses. The consultant projects 545 housing units in 2000.*

## NHA Housing

A 1997 estimate by Navajo Nation Community Development Department lists 495 occupied housing units in the Chapter. Of the total, 65 units were constructed by NHA. These include 30 rental, 25 homeowner, and 10 mutual help units. The NHA houses built during the late 1960s and 1970s were part of a recent modernization project.



*NHA lists 32 community residents who need new housing built in the Chapter.*

*The Chapter lists 177 persons who need new low income or replacement housing . Another 104 persons need housing renovations.*

*A recent study found 64 housing units without plumbing and 57 units which need bathroom additions.*

Ten units are maintained by the school district (including three one-bedroom apartments are currently under construction). A year 2000 consultant estimate finds 545 total units.

### 3.2 Housing Needs

The most current waiting list prepared by NHA shows a need for 27 public rental, 4 homeowner, and 1 scattered unit.

The Chapter has compiled a waiting list of 177 individuals broken down as follows:

- new low income	134
- replacement	<u>43</u>
Total new	177
- renovations	104

Many homes lack indoor plumbing. More than 50% of Navajo homes lack complete kitchens and more than 40% of Navajo households rely solely on hauling water to meet daily water needs (Navajo-Gallup Water Supply Project, 2000).

A recent feasibility study performed by the IHS Office of Environmental Health found 64 housing units without plumbing and 57 units which need bathroom additions.

### **3.3 Proposed Housing**

The Chapter will need to build between 95 and 240 houses to meet current and future need by 2010. This number depends on whether using the chapter or NHA reported figure for current need. NHA currently proposes to build three scattered site houses in the Chapter.

The Chapter proposes the development of housing with the priority for scattered first, then clustered housing, and then subdivisions. Seven sites have been proposed which are listed in Exhibit 8 and shown in Exhibit 9 and 10:

- (1) west of the old Boarding School tract
- (2) *site has been eliminated*
- (3) east of current subdivision, along NR19 on south side
- (4) south on Hwy 666, on east side
- (5) *site has been eliminated*
- (6) east on NR9, near Coyote Canyon boundary
- (7) Tohlakai Road.

Scattered housing or low-density clustered housing is proposed in the areas along existing utility lines in the community.

*The majority of the land base is tribal trust land located on the reservation and comprised of 71,659 acres. In the strip portion of the Chapter along the southern boundary of the reservation, checkerboard lands occur.*

*Grazing occurs on the majority of tribal trust land. In the Tohlokai area. Grazing is limited to the allotments. Approximately 70 families are grazing permit holders in the community. There are 50 family farms in the chapter.*

#### **4.0 Land Status**

The Chapter has a total acreage of 74,500 acres (Exhibit 5 on the following page). The majority of the land base is tribal trust land located on the reservation and comprised of 71,659 acres. In the strip portion of the Chapter along the southern boundary of the reservation, checkerboard lands occur:

- Tribal Fee - 791 acres
- State - 892 acres
- BLM - 252 acres
- Allotted - 581 acres
- Private - 311.5 acres at Tohlokai.

#### **5.0 Grazing and Agriculture**

Grazing occurs on the majority of tribal trust land. In the Tohlokai area, grazing is limited to the allotments. Approximately 70 families are grazing permit holders in the community.

Grazing activity has declined on the reservation during the past 25 years. In 1993, the number of livestock had declined by a third from its number in 1975 (Exhibit 6).

In addition, there are 50 family farms in the Chapter. The chapter has proposed a farm cooperative center but no location has been identified. The chapter has also discussed using the Gallup-McKinley Water Supply pipeline for farming but that water is designated for domestic use.

*Exhibit 6: Livestock Grazing*

#### **NAVAJO LIVESTOCK NUMBERS: 1942-1993**

Sheep/Goats, Cattle and Horses  
(in '000 Heads)

	1942	1947	1952	1957	1960	1966	1970	1975	1988	1993
Horses	27	27	27	24	21	22	22	29	12	103
Cattle	8	8	9	15	16	30	34	48	42	47
Sheep/Goats	414	274	262	347	390	503	482	510	197	136
TOTAL	449	309	298	386	427	555	538	587	251	286

Source: Dr. Lyle G. McNeal, Director, Navajo Sheep Project, Utah State University, Logan, Utah.

*Exhibit 5: Land Status Map*



*A number of businesses exist in the community. They are located on private land in the Tohlakai area.*

*Three proposed commercial sites have been identified along U.S. 666 at Tohlakai, near the Chapter house, and at N 9.*

## **6.0 Commercial and Industrial Development**

This section describes existing and proposed business uses which are listed in Exhibit 8 and shown in Exhibits 9 and 10. Existing and proposed housing business sites are also shown on the enclosed large scale map in the pocket of this report binder.

### **6.1 Existing**

A number of businesses exist in the community. They are located on private land in the Tohlakai area. A Mustang convenience store and gas station is located near the former trading post. The convenience store includes a laundromat. An auto sales and impound lot also are located on the private land.

A trading post also existed at one time near the current Chapter house.

### **6.2 Proposed**

Three proposed commercial sites have been identified along U.S. 666 at Tohlakai, near the Chapter house, and at N 9. Uses include:

Tohlakai Businesses

- Hotel
- Gas station/truck stop



- Retail/mini mall
- Arts/crafts center
- RV park.

Other proposed uses include an auto sales business.

### **6.3 Mineral Development**

Coal mining operations are taking place in the extreme southwestern part of the Chapter. The McKinley Mine is to shut down operations in a few years. At one of the community meetings an interest was expressed by the chapter in acquiring mineral rights and royalties, however current Navajo Nation law would preclude this.

### **6.4 Tourism Opportunities**

Twin Lakes is located along U.S. 666, a major highway which connects Gallup and Farmington. Tourists travel through the community on their way to major Four-Corners regional attractions including the Gallup Intertribal Ceremonial, Chaco Canyon, Mesa Verde, etc. Navajo Route 9 is a connecting highway to Chaco Canyon. Opportunities exist for the Chapter to develop businesses that cater to travellers.

*Community facilities located in the Chapter include the Chapter house, preschool, and elementary school. A senior center is currently under construction.*

*Proposed community facilities include a new Chapter house, clinic, police/fire substations, post office, rodeo arena, library and satellite community college.*

## **7.0 Community and Public Facilities**

Existing community facilities in Twin Lakes include the Chapter house, preschool, and elementary school. Proposed community facilities include a new Chapter house, clinic, police/fire substations, post office, rodeo arena, library and satellite community college. Existing and proposed community uses are listed in Exhibit 8 and shown in Exhibits 9 and 10. Existing and proposed community facilities are also shown on the enclosed large scale map in the pocket of this report binder.

### **7.1 Existing Chapter House**

The current Chapter house, built in 1960, is used as a multi-purpose building with sub-offices for social services (Exhibit 7). Tribal services provided at the Chapter house include:

- Community Health Representative
- Adult In-Home Care
- Community Development
- Division of Diné Education (Headstart).

A warehouse is located next door.

## Chapter House



### **7.2 Proposed Chapter Compound Facilities**

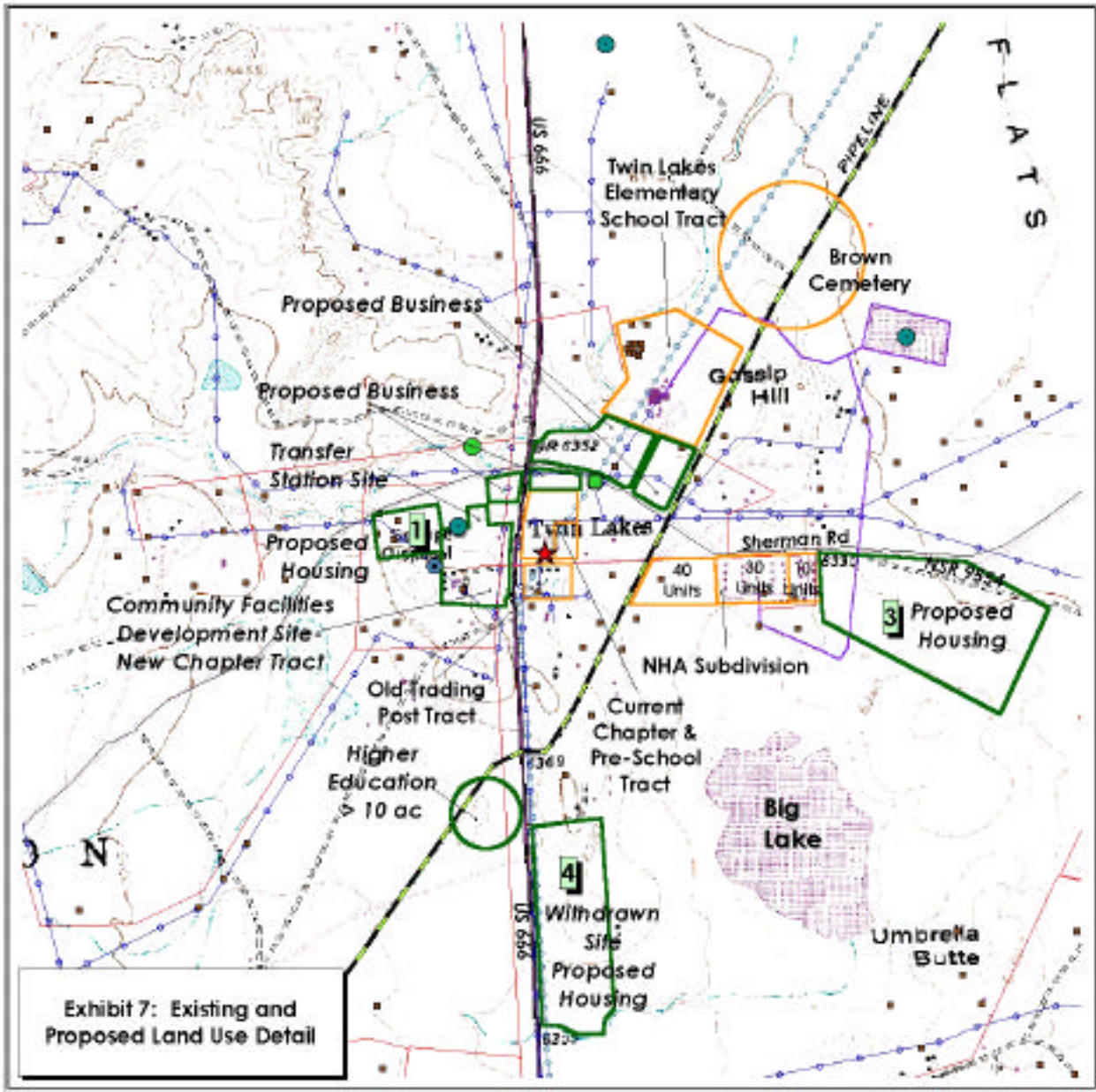
The Chapter has identified the 14.5 acre site of the former Twin Lakes BIA Boarding School as the location for new community facilities (Exhibit 7). The site is located on the west side of U.S. Highway 666 across from the existing Chapter house. A 100-foot right-of-way on the east side of the site is being given for U.S. 666 roadway. The Chapter is attempting to obtain additional land on the west side of the site to make up for this loss of land. Some of the possible uses at the site include:

- Senior Citizen Center
- New Chapter House and Administrative Offices
- Multi-purpose building which may serve some of these uses:
  - Preschool
  - Clinic
- Transfer Station.

Other community uses to be located at an undetermined site include:

- Veterans Memorial Park
- Community Park
- Post Office.

Exhibit 7: Detail of Existing and Proposed Land Use



Note: Site 6 and Site 7 are outside of this detail view.



### **7.3 Public Safety**

#### **Existing**

The nearest police substation serving Twin Lakes is located in Tohatchi. A McKinley County sheriff also serves the area. A McKinley County fire substation is located at Yahtahey. The EMS service is located in Tohatchi. No emergency 911 service is currently available.

#### **Proposed**

A police and fire substation are proposed for the community but the site is not yet located.

### **7.4 Health Care**

#### **Existing**

The nearest health care facilities are located at Tohatchi Health Center and Gallup Indian Medical Center.

#### **Proposed**

A clinic is proposed for the community. Other proposed uses include a Nursing Home facility.

### **7.5 Education**

#### **Existing**

Twin Lakes Headstart serves 40 pre-school children.

Twin Lakes Elementary School is located on the east side of U.S. Highway 666, north of the turn-off to the NHA subdivision. Enrollments have fluctuated between 220 and 250 during the last several years.

Twin Lakes children also attend Tohatchi Middle School and High School and Gallup High School. In addition, Ch'ooshgai Community School serves children from Twin Lakes.

#### **Proposed**

The Chapter desires to locate a satellite community college at Twin Lakes. A joint college-community use library could be developed along with the classroom buildings. A 10-acre site has been identified.

A new preschool is proposed at the multi-purpose site. In addition, various classroom and other facility improvements are needed at the community school.

## Twin Lakes School



### **7.6 Recreation**

#### **Existing**

No recreation facilities currently exist in the community. Several individual homes have roping areas and small arenas for local rodeo activities.

#### **Proposed**

A rodeo arena which could handle large rodeo events is proposed for the community.

The current Chapter house site is a potential location for a recreation/youth center and possibly baseball field.

### **7.7 Cemetery**

A second community cemetery is proposed in the same general location as the existing cemetery.

*Exhibit 8: Proposed Development Sites*

<b>Twin Lakes Chapter Proposed Development Sites:</b>			
	<b>acreage</b>	<b>proposed uses</b>	<b>withdrawn</b>
1. Twin Lake New Chapter Tract	14.5	Chapter Administration Bldg. Preschool Senior Center Clinic Transfer Station	yes
2. Existing Chapter House Compound existing chapter house existing preschool	11	Recreation Rodeo Grounds	yes
3. Old Twin Lakes Trading Post existing residence	4	None	yes
4. Twin Lakes Elementary School site existing 11 teacherages existing school	30	Additional teacherages School improvements	yes
5. Cemetery Site	2	Community cemetery plus additional 2 acres	yes no
<i>Total Withdrawn Areas:</i>	<i>61.5</i>		
8. Higher Education Site	20	Satellite campus	no
9. Police/Fire Station	4	No site yet identified	no
10. Business Sites - Tohlakai total existing Mustang store existing 2 churches existing car sales/impound lot	260		private
setback 750 feet from U.S. 666 existing	ND	Retail	no
11. Business Sites - near Chapter House	20.9	Car sales	
12. Business Site - N9 setback 750 feet from U.S. 666	ND	Gas station/truck stop Laundromat Hotel Arts/Crafts RV/trailer park	no
<i>Total known/estimated acreage</i>	<i>304.9</i>		

*Exhibit 8 (continued): Proposed Development Sites*

13.	Housing Site 1 west of the old Boarding School tract	7.5	clustered housing	no
14.	Housing Site 2 ( <i>eliminated</i> ) N 19, north chapterhouse/south of school	-	clustered housing	no
15.	Housing Site 3 N 19, east of current NHA subdivision	56	clustered housing	no
16.	Housing Site 4 south Hwy 666 (near gas line crossover)	31	clustered housing	no
17.	Housing Site 5 (eliminated) N Hwy. 666	-	clustered housing	no
18.	Housing Site 6 east N9 past gas line	88.5	clustered housing	no
19.	Housing Site 7 Tolakai area	36	clustered housing	no
	<i>Total housing sites acreage</i>	<i>219</i>		

ND - specific site and acreage not yet determined



*Exhibit 9: Land Use Map*

*Exhibit 10: Proposed Land Use Map*

*This section describes the existing and needed infrastructure in the community, such as roads and utilities. It also assesses the proposed housing sites in terms of their need for additional infrastructure.*

## **1.0 Existing and Needed Infrastructure**

This section describes the existing and needed infrastructure, such as roads and utilities, in the community (Exhibits 9 and 10). Existing and proposed infrastructure are also shown in the enclosed large scale map in the pocket of this report.

### **1.1 Transportation**

#### **Roads**

- Existing

US 666 is the major highway that crosses the Chapter with a current high traffic volume of approximately 6,000 average daily count (ADTs). Navajo Route 9 is a major road from Twin Lakes to Coyote Canyon, Standing Rock and Crownpoint, with a 3,164 ADTs. A scenic byway to Mexican Springs (N 30) begins at Twin Lakes, with 120 ADTs. Sherman Road (N 9554) is the main roadway into the NHA housing area and community school.

Other major roadways, all unpaved, include:

- Jack Johnson Road (N36)/Bass Lake Road
- Tso Road
- N 9514
- Deer Springs Road (N9505)
- N 9504.

- Proposed

Proposed road improvements include:

- Pave Jack Johnson, Bass Lake and Sherman Roads
- Pave Mexican Springs Road (N30 --scheduled FY2001
- Replace bridge over Fiquerdo Wash (N9504); scheduled FY2000
- N9 (pavement in severe condition) to Coyote Canyon is scheduled for resurfacing FY2000.

#### **Transit and Rail**

- Existing

Currently, there is a bus route from Window Rock to Shiprock. The nearest railroad is the Burlington Northern freight railroad and Amtrack passenger service in Gallup.

- Proposed

No transit service is proposed.

A study was prepared in 1994 by the San Juan Basin Transportation Development Committee to determine the feasibility of a freight rail alignment to parallel U.S. 666 from Gallup to the Shiprock and Farmington areas. If built, the railroad would go through Twin Lakes. The estimated construction cost is \$73 million. Unless the price of coal increases, it is unlikely this rail alignment will be built.

#### **Airport**

- Existing

No airport runway exists in the Chapter.

- Proposed

No airport facilities are proposed. The nearest airport is in Gallup.

## **1.2 Utilities**

### **Gas**

- Existing

A major natural gas pipeline runs through the Chapter; however, it serves only the NHA housing and BIA school.

- Proposed

Twin Lakes Chapter wishes to provide service to all community housing units. According to the NTUA gas engineering department, gas installation costs approximately \$25 per linear foot and any major gas pipeline taps will cost approximately \$60,000. Although the price of natural gas for domestic use is one third less than the cost of LP (propane), the initial cost to install the natural gas system is expensive. In most cases, the natural gas installation cost exceeds profit margins for more than 20 to 30 years. Therefore, NTUA only supplies natural gas to areas with high numbers of community homes, commercial and industrial buildings.

### **Electric**

- Existing

Most of the Chapter is served by electric power. There are three phase and single phase power sources throughout the Chapter. A major transmission line also runs through the Chapter.

- Proposed

Currently, information on how many power lines will be extended to serve additional housing units by NTUA is not available.

### **Telephone/Communications**

- Existing

Telephone service runs along US 666. Connections among several houses is provided by Navajo Communications.

- Proposed

Navajo Communications will upgrade telephone lines if necessary.

### **Water**

- Existing

Currently, several homes, the Chapter compound, school and housing areas are served by water. The Twin Lakes water system is tied-in with Tohatchi and Mexican Springs water systems. NTUA provides approximately 336 water meters in the Twin Lakes community. The Twin Lakes water system provides two water storage tanks (150,000 gallons each), with a well (#14T-531) at 155 gpm minimum capacity.

Per an NTUA sales report dated 1998, Twin Lakes water sales were \$96,347, and maintenance expenses were \$46,448. In addition, NTUA produced 28.4 million gallons of water, 25 million gallons were used by Twin Lakes community, and 3.2 million (11.4%) gallons were lost.

- Proposed

I.H.S.-O.E.H. is planning a new major water line project in the Chapter to serve 84 houses. Residences will need individual plumbing and sewer systems as part of the project.

#### *NIIP Alternative 34,000 Acre Feet*

The draft *Technical Memorandum: The Navajo-Gallup Water Project* (March 2000) states, "A long-term high quality, municipal and industrial water supply is needed to improve the standard of living for current and future populations and to support economic growth of the Navajo Nation, the Navajo Agricultural Products Industry (NAPI), and the City of Gallup. The Navajo-Gallup Water

Supply Project has evolved over four decades as a major infrastructure initiative to supply approximately 36,000 acre-feet of water annually from the San Juan River to meet these needs.”

The main Navajo-Gallup Water Supply Pipeline will run through Twin Lakes. The project:

...will divert approximately 36,000 acre-feet of water annually from the San Juan River for municipal and industrial use . The service area of the Project includes more than 20 Navajo Chapters in Arizona and New Mexico, Navajo Agriculture Products Industry (NAPI), the City of Gallup, and service to the Navajo land surrounding Gallup. The pipeline begins at the proposed Gallegos Reservoir at Navajo Indian Irrigation Project (NIIP) and proceeds south to the existing El Paso Natural Gas pipeline corridor. The pipeline route follows the gas line corridor to the vicinity of Twin Lakes where it turns south to Yah-ta-hey and connects to a lateral to Window Rock and to the water distribution system for the City of Gallup (Navajo-Gallup Water Supply Project, 2000).

Another alternative is to route the water pipeline along Route 666 from Shiprock to Gallup, New Mexico. Appraisal level construction cost estimate \$350,000,000.

The San Juan River Diversion Alternative:

- Provides full projected water demand for service area through the year 2040.
- Diversion from San Juan River using existing Hogback or PNM diversions to Navajo Corridor and Shiprock. Includes treatment plant, pumping plants, and pipelines. Pipelines connect to existing distribution systems and include tees for future distribution systems where none exist today. Appraisal level construction cost is \$340,000,000.

#### **Sewer**

- Existing

A sewer lagoon is located northeast of the Chapter. The area served includes NHA housing, the Chapter house and the BIA Elementary School. Smaller treatment systems are scattered throughout the Chapter to serve

clusters of homes. The capacity of the sewer lagoon may need to be expanded to accommodate additional housing.

## **Site 1**

### **Accessibility**

*Site can be accessed from US 666 and Navajo Service Road #9514 adjacent to the site.*

### **Existing Utilities**

*Water: Tap into existing three-inch PVC water line runs through the site, feeding 13 homes west of the site.*

*Sewer:*

*Tap into the existing sewer line near the Chapter.*

*Road borings or cutting will be required to run the sewer line across US 666.*

*Gas:*

*Gas line extension from the Chapter and NHA housing will be required. Road borings will be required to cross US 666.*

*Electrical: A three-phase line runs parallel with US 666 and can be extended.*

*Telephone: The telephone line will need to be extended from US 666. Further study on rights-of-way needed.*

- **Proposed**

New sewer lagoon(s) will need to be built in areas of proposed clustered housing. The size and type of waste water treatment systems are determined on an individual basis. Sewer lagoons usually require four to six acres of additional land and must be at least 1,000 feet away from the nearest building.

### **Solid Waste**

- **Existing**

No existing transfer station is located in the Chapter. The regional landfill is located in Farmington, New Mexico.

- **Proposed**

A transfer station is proposed at the old Boarding School site.

## **2.0 Analysis of Sites**

This section assesses the proposed housing sites in terms of their need for additional infrastructure (Exhibits 13a - 13g).

### **2.1 Site 1:**

#### **Site Accessibility**

The site is located across from the Chapter and next to the proposed multi-use center. The site can be accessed from US 666, which runs north to south between the site and Chapter house. Another access is Navajo Service Road #9514, which is adjacent to the site and runs east to west.

#### **Site Related Aspects**

There are no existing building or structures located on site. The site, however, is located within the old Bureau of Indian Affairs (BIA) school tract. There is an existing concrete water storage tank located on the hill south of the site. A few old barbed wire and wood post fence remnants remain in the old BIA school tract fence line.

#### **Existing Utilities**

*Water: A three-inch PVC water line runs through the site and feeds thirteen homes west of the site.*

Other utilities: No other utilities noted on site.

### **Site 3**

#### **Accessibility**

*The site is accessible from Navajo Service Road 9, paved from Highway 371 to NHA Subdivision.*

#### **Existing Utilities**

*Sewer line runs across the site, south to north. The sewer line links to the community sewer lagoon.*

*A four-inch water line, which runs across the north side of the site to service homes, is located on the east side.*

#### **Project Utilities Development**

*Water:*

*Tap into the four-inch water line located on site.*

*Further review of fire flow and domestic demands.*

*Sewer:*

*The site could tie into the existing sewer system; install a few manholes to adequately maintain.*

*Gas: Gas line extension from the subdivision will be required.*

*Electrical: Extend the power line to the proposed site from NHA subdivision.*

*Telephone: Can easily be extended to the proposed site from NHA subdivision.*

#### **Project Utilities Development**

Water: The site may tap into the three-inch water service. However, further engineering evaluation will need to be completed for proper fire flow requirements. Fire hydrants for cluster homes usually require an eight-inch water tap.

Sewer: The site location is feasible for tapping into the existing sewer line near the Chapter. Road borings or cutting will be required to run the sewer line across US 666. This will cause the cost of infrastructure to rise.

Gas: A two to four inch gas line extension from the Chapter and NHA housing units will be required. Again, additional road boring will be required to cross US 666.

Electrical: A three-phase line runs parallel to US 666. The site will require power extension from US 666, but should not be a major cost of the project.

Telephone: The telephone line will need to be extended from US 666. Further study on rights-of-way will be required.

#### **Special Site Development Requirements**

Further archaeological clearance and environmental studies will need to be incorporated by the Chapter.

The Twin Lakes Chapter will coordinate rights-of-way, permits, and utility corridors for gas, sewer, electrical, and telephone lines with NHA, I.H.S., and the New Mexico State Highway and Transportation Department.

#### **Legal Considerations**

Proper land withdrawal acquisition will be required of the Chapter. No other legal requirements noted at this time.

**2.2 Site 2:** This site was changed to a proposed business site.

#### **2.3 Site 3: Site Accessibility:**

The 56-acre site starts from the east boundary of the existing NHA subdivision to approximately 1,600 feet east.



The site is accessible from Navajo Service Road #9, which is paved from Highway 371 to NHA Subdivision.

### **Site Related Aspects**

There are a few homes located northwest (400 feet) and east (1,500 feet) of the site. There are no existing buildings or other structures on site.

### **Existing Utilities**

The only utilities available on site are a sewer line running across the site, south to north, from the NHA Subdivision, and a four-inch water line which runs across the north side of the site to homes located east of the site. The sewer line links to the community sewer lagoon. No other utilities exist on site. However, the Chapter could easily extend utilities from the adjacent NHA subdivision.

### **Project Utilities Development**

Water: The site could possibly tap into the 4 inch water line located on site. Further review of fire flow demands and domestic demands will need to be completed.

Sewer: The site could tie into the existing sewer system and will need to install a few manholes to adequately maintain the sewer system.

Gas: The NHA Subdivision provides gas service to each unit. Gas line extension from the subdivision will be required.

Electrical: The NHA Subdivision provides adequate power to the subdivision site. It would be advantageous to extend the power line to the proposed site to service additional housing units.

Telephone: Telephone service is available from the existing NHA Subdivision and can easily be extended to the proposed site.

### **Special Site Development Requirements**

No special site development requirements are noted at this time.

### **Legal Considerations**

Proper land acquisition procedures will need to be provided by the Chapter. Further site planning studies

such as geotechnical studies, archaeological clearance, and section 106 surveys will need to be carried out by the housing development providers.

#### **Site 4**

##### **Accessibility**

*The site is accessible on the northwest corner at the inlet. Significant earthwork will be required to develop an access road across the existing drainage.*

##### **Existing Utilities**

*Water: Six-inch AC pipe water line along US 666.*

*Telephone: A buried telephone line runs along the US 666 right-of-way and west edge of the site.*

*Electrical: A three-phase electrical powerline runs along the west side of Highway 666.*

*Water: A six-inch water line can be extended.*

*Sewer: A new sewer collection and treatment system will need to be developed.*

*Electric: Can be extended from line along US 666.*

*Gas: Gas line extension would be required from the Chapter tract to the proposed site.*

*Telephone: The telephone line runs adjacent to the site.*

#### **2.4 Site 4**

##### **Site Accessibility**

The site is located approximately two miles south of the Chapter, on the east side of US 666.

The site is accessible on the northwest corner where the State Highway Department provided an inlet to US 666. Other possible approaches can be developed along US 666. However, it may add significant earthwork to develop an access road across the existing drainage located between the proposed site and US 666.

##### **Site Related Aspects**

There are a few homes located northeast of the site. One hogan is located near the northeast corner of the site. The Chapter will need to review the home sites in this area. No other buildings or structures exist on site.

##### **Existing Utilities**

**Water:** A six-inch water line runs parallel with US 666 and the west edge of the site. A two-inch PVC water line branches off the six-inch water line at approximately 200' north of the site. The two-inch water line services the homes located north of the site. There is no surface water noted and the site appears to be well drained.

**Telephone:** A buried telephone line runs along the US 666 right-of-way and west edge of the site. No other utilities are available on site.

##### **Project Utilities Development**

**Water:** A six-inch water line is available on site.

**Sewer:** A new four to six-acre sewer collection and treatment system will need to be developed.

**Electrical:** A three-phase electrical power line runs along the west side of US 666. If the site is developed, the power can be extended from the west side of US 666 to the project site. The three-phase line should provide adequate power.

## **Site 6**

### **Accessibility**

*The site is accessible from the northern edge along side Navajo Route 9.*

### **Existing Utilities**

*There are no utilities available on site except nearby telephone lines.*

### **Project Utilities Development**

*Water: A six-inch water line serves the Coyote Canyon Subdivision near the site and can be extended.*

*Sewer:*

*A new sewer collection and treatment system will be required. It could be possible to connect to the Coyote Canyon Subdivision sewer lagoon system.*

*Electrical: Extension of electrical lines will be required from the power source servicing the Coyote Canyon Subdivision.*

*Gas:*

*There is a major gas line running diagonally on the northwest of the site. The other alternative is to install individual LP tanks.*

*Telephone: Telephone lines will need to be extended from Navajo Route 9.*

Gas: A gas line extension would be required from the Chapter tract to the proposed site. NTUA will probably review profitability before developing a new gas line.

Telephone: The telephone line runs adjacent to the site and it will not be costly to provide services to the proposed housing site.

### **Special Site Development Requirements**

There are no significant site development issues at this point. The only concern would be the rock outcrop noted at the center of the site, which might be larger than it appears. This would add some cost for utility infrastructure, however, it should not have a significant impact on the development.

### **Legal Considerations**

The Chapter will need to review the archaeological site described in the Suitability Analysis. Further archaeological and environmental assessment will need to be provided by the Chapter. In addition, the Chapter will need to follow the land withdrawal procedures set in place by the Navajo Nation Land Office.

## **2.5 Site 5**

This site has been eliminated from consideration due to drainage and archeological site issues.

## **2.6 Site 6 Site Accessibility**

This 88-acre site is located on the southside of Navajo Route 9, approximately two-miles from the Highway 371 turnoff.

The site is accessible from the northern edges alongside Navajo Route 9.

There are at least three residences located southeast of the site.

### **Site Related Aspects**

There are no existing buildings on site.

### **Existing Utilities**

There are no utilities available on site. All required utilities will need to be developed or extended from the nearest source.

### **Project Utilities Development**

Water: A six-inch water line services the Coyote Canyon Subdivision near the site. Water line can be extended to the site at a minimum cost.

Sewer: A new sewer collection and treatment system will be required to be developed. There could be a possibility of connecting to the Coyote Canyon Subdivision sewer lagoon system. However, further review of inverts and elevation requirements for the sewer line connection will be required.

Electrical: Electrical lines will required to be extended from the power source servicing the Coyote Canyon Subdivision.

Gas: There is a major gas line running diagonally on the northwest of the site. NTUA will most likely review profitability before tapping into the major gas line to service the proposed site. The other alternative is to install individual LP tanks at each proposed housing unit.

Telephone: Telephone lines will need to be extended from Navajo Route 9, which should not be a significant cost impact to the site.

### **Special Site Development Requirements**

Based on the Suitability Analysis, the site contains archaeological sites which may be hard to avoid. Further archaeological survey and Section 106 consultation with the Navajo Historical Preservation Office will be required before any development occurs on the site, or land withdrawal is approved. It is most likely that this site will be eliminated from proposed housing development sites.

### **Legal Considerations**

The Chapter will be required to comply with the Navajo Land Office procedures for acquiring the land withdrawal. There are also other residences near the area which may possibly hold grazing rights in the area. The Chapter will need to get approval from grazing permittees before developing.

## **Site 7**

### **Accessibility**

*The site is accessible from Tso Road, an unpaved road.*

### **Existing Utilities**

*There are no utilities available on site.*

### **Project Utilities Development**

*Water: A three-inch water line would need to be extended 400 feet.*

*Sewer:*

*A new sewer collection and treatment system will be required.*

*Electrical: Extension of a single-phase line approximately 400 feet is required.*

*Gas:*

*LP tanks are the most feasible source of heat.*

*Telephone: Telephone lines will need to be extended from Tohlakai.*

## **2.7 Site 7**

### **Site Accessibility**

The site is located approximately one mile east of Tohlakai Trading Post, along Tso Road.

The site is accessible from Tso Road (dirt road) and US 666 is one mile to the west.

### **Site Related Aspects**

There are several home sites located approximately one mile southwest and 400 feet southeast of the site.

There are no existing structures on the site. A dirt road cuts through the site from the southwest corner to the northeast corner.

### **Existing Utilities**

There are no utilities on site. All utilities will need to be developed or extended from its nearest source.

### **Project Utilities Development**

**Water:** A three-inch water line is available 400 feet southwest of the site. This line will need to be upgraded to meet fire code and fire hydrate standards.

**Sewer:** A new sewer collection and treatment system will need to be developed.

**Electrical:** A single phase line is available 400 feet south of the site. Further analysis of the electrical capacity and demand will need to be completed.

**Gas:** There are no gas lines on or near the site. Individual LP tanks will most likely be installed for the housing site.

**Telephone:** No telephone lines are available in the immediate area.

### **Special Site Development Requirements**

There are no significant site development requirements at this time. However, the access road may require a new bridge development at the single lane bridge crossing 3,000 feet west of the site.

### **Legal Considerations**

The Chapter will be required to properly withdraw the land before developing any housing. Grazing permittees in the area may need to be consulted.

## 1.0 Overview of Resources in the Chapter

This section provides an overview of natural and cultural resources in the Chapter.

### 1.1 Natural Resources

#### Geology/Soils

Twin Lakes lies within the Colorado Plateau physiographic province, which is characterized by mesas that dip gently to the north and broad valleys with intermittent streams. The plateau encompasses much of western Colorado, eastern Utah, northeastern Arizona, and northwestern New Mexico. More specifically, Twin Lakes is located on the Zuni Uplift of the San Juan Basin. The San Juan Basin is a structural depression occupying a major portion of the southeastern Colorado Plateau. The San Juan Basin is underlain by up to 10,000 feet of sedimentary strata, which generally dip gently from the margins toward the center of the basin. Relatively small, elongated domes, uplifts, and synclinal depressions characterize the margins of the basin.

From the time that the Spanish arrived in the 16th century, geology has played an important role in New Mexico's economy. New Mexico is rich with several ore bodies and mineral deposits. Gold, silver, copper, lead, coal, and uranium have all been mined from the area. Other kinds of mineral wealth (petroleum and natural gas) come from the San Juan Basin.

New Mexico's tumultuous physiographic history has resulted in surface rock outcrops of many kinds. Mountain building, graben formation, volcanism, and erosion have placed varied rocks and minerals at the surface, which have weathered into many types of soils. The valley floors are gently to strongly sloping and the mesa tops and upland areas are gently sloping to rolling. Outcrops of sandstone and shale are common on the steep canyon walls and escarpments. These soils generally support a fair to good cover of native vegetation consisting of a relatively wide variety of grasses and shrubs.

General soils in the area are classified as being in the Ustollic subgroup of the Aridisol order. These soils are reflective of a semi-arid environment and gently sloping

*This sub-section discusses the natural resources of the Chapter:*

- Geology/Soils
- Groundwater
- Surface water
- Vegetation
- Wildlife
- Threatened and endangered species

*Twin Lakes is located on the Zuni Uplift of the San Juan Basin. The San Juan Basin is a structural depression occupying a major portion of the southeastern Colorado Plateau. The San Juan Basin is underlain by up to 10,000 feet of sedimentary strata, which generally dip gently from the margins toward the center of the basin. Relatively small, elongated domes, uplifts, and synclinal depressions characterize the margins of the basin.*

landscape. Ustollic soils tend to have more vegetation growing on them than other Aridsols. Aridsols are characteristically developed in alluvium from sedimentary formations dominated by sandstone and shale.

Soil information has been collected but not published for McKinley and San Juan counties, which includes the Twin Lakes Chapter. The Bureau of Indian Affairs (BIA) in Gallup, New Mexico has supplied us with draft information about soils relevant to the proposed housing sites.

*The Gallup Sandstone is the principal aquifer in the area. Wells average from 200' to 500' below surface level. Most wells produce less than 10 gallons per minute (gpm).*

*The surficial drainage is poorly developed in the area, and consists mainly of numerous unnamed ephemeral washes originating in the highland and crossing the area.*

*Desert grasslands cover the majority of the chapter. A combination of mixed prairie, grama-galleta steppe, plains and Great Basin grassland, snakeweed grassland, and the alkali sacaton-saltbrush series of the Great Basin region. Transitional piñon-juniper may be found on sandstone outcroppings. Vegetation in the arroyos is generally dominated by four-wing saltbush, pale wolfberry, western wheatgrass, and alkali sacaton.*

### **Groundwater**

Regional groundwater flows from topographically high outcrop areas toward lower outcrop areas. Much of the recharge to aquifers in New Mexico occurs on the flanks of the Zuni, Chuska, and Cebolleta Mountains. The San Juan River is the main discharge for the area. Regional aquifers in northwestern New Mexico are grouped into multiple aquifer systems based on hydrologic relationships (New Mexico Bureau of Mines and Mineral Resources, 1983).

The Gallup Sandstone is the principal aquifer in the area. Wells average from 200 feet to 500 feet below surface level (McKinley County 1990). Most wells produce less than 10 gallons per minute (gpm).

### **Surface Water**

Western New Mexico's semi-arid climate gives the region characteristically high surface evaporation rates. Significant runoff is rarely observed on the proposed housing sites because most of the runoff collects, infiltrates the ground, or evaporates locally. The average annual pan evaporation rate for nearby Gallup, New Mexico is 75". Information on pond evaporation rates varies, but the average is approximately 86" per year. Runoff results from rainfall (primarily as monsoon storms from July through September) and snow melt occurring on site and in the sandstone highlands. The surficial drainage is poorly developed in the area, and consists mainly of numerous unnamed ephemeral washes originating in the highland and crossing the area.

### **Vegetation**

Within the region, vegetation patterns relate to



topography. For example, desert grasslands cover the majority of the Twin Lakes Chapter. Typical grassland sites in the region consist of rolling hills with a few sandstone outcrops. The grassland vegetation is a combination of mixed prairie, grama-galleta steppe, plains and Great Basin grassland, snakeweed grassland, and the alkali sacaton-saltbrush series of the Great Basin region. The most obvious vegetation elements are grasses, shrubs, and introduced annuals, especially tumbleweed or Russian thistle. Blue grama, cheatgrass brome, foxtail barley, galleta, squirreltail, and Indian ricegrass are the most abundant grass species. Mixed with these are a number of subshrubs and shrubs including snakeweed, rabbitbrush, four-wing saltbush, and pale wolfberry or desert-thorn. Transitional piñon-juniper may be found on sandstone outcroppings. Vegetation in the arroyos is generally dominated by four-wing saltbush, pale wolfberry, western wheatgrass, and alkali sacaton.

*Wildlife in the area include:*

- *Mule deer*
- *Pronghorn*
- *Mountain lions*
- *Black bear*
- *Coyote*
- *Fox*
- *Desert cotton tail*
- *Black-tailed jackrabbits*
- *Skunks*
- *Prairie dogs*
- *Hawks*
- *Falcons*
- *Eagles.*

**Wildlife**

Big game animals are not common in the region. Mule deer and pronghorn occur in the region, but the preferred habitat of both of these big game species is not present in the immediate vicinity of the proposed housing sites.

Mule deer prefer broken landscapes and tree cover. The piñon-juniper vegetation over 15 miles from the project site would provide better habitat.

In northwestern New Mexico, pronghorns occur in grassland-desert scrub habitat wherever high densities of food can be found. One herd occurs east of Farmington, another is located in Grants. The State of New Mexico has not reported any pronghorns in the area, but it is possible that they could wander into the area from their known habitat to the north and south.

Mountain lions and black bear have been recorded in the region. These predators range over a large area and could occasionally pass through the area as well.

Coyote and fox, both of which adapt well to arid conditions, may occur in the area. Desert cottontail, black-tailed jackrabbits, skunks, prairie dogs, small rodents, lizards, and prairie dogs are common in the

region. These animals serve as a prey base for medium-sized and large carnivores and predators.

The open grasslands of the region provide good hunting for raptors, such as hawks, falcons, and eagles. The sandstone escarpment could provide nesting habitat or roosting sites, and the scattered piñon-junipers could provide refuge. Songbird diversity is expected to be low because of the sparse nesting cover. Waterfowl and shorebirds may pass through the region during migration.

Much of the area is used for grazing cattle, sheep, and/or other domestic livestock.

*Species of concern in the area include:*

- *Black-Footed Ferret*
- *Southwestern Willow Flycatcher*
- *Golden Eagle*
- *Mountain Plover*
- *Ferruginous Hawks*
- *Western Burrowing Owl*
- *Northern Leopard Frog.*

### **Threatened and Endangered Species**

The following description provides background information regarding plant and animal species that have been afforded protected status by the Navajo Nation and are known to occur in the region or in habitats similar to those found on the proposed housing sites. The list of species of concern was provided through a database inquiry with the Navajo Natural Heritage Program (Nelson 2000). Species of concern include protected, candidate, and other rare or otherwise sensitive species, including certain native species and species of economic or cultural significance. For each species, the following tribal and federal statuses are indicated: Navajo Endangered Species List (NESL); federal Endangered Species Act (ESA); Migratory Bird Treaty Act (MBTA); and, Eagle Protection Act (EPA). No legal protection is afforded species with only ESA-candidate or NESL-group 4 status.

There is no designated critical habitat for federally listed species on the proposed housing sites. However, prior to development of any of the proposed housing sites, the Navajo Natural Heritage Program would need to be contacted for an updated list of species of concern and biological surveys would be required for those listed species during the appropriate field season and following established protocol. As of May 2000, species of concern that could occur on the project sites are briefly discussed below.

The **Black-Footed Ferret** (ESA-endangered, NESL-group 2) is usually found in association with prairie dog towns in grassland plains and surrounding mountain bases up to 10,500' above sea level. A survey for black-footed ferrets is required if a prairie dog town is present and larger than 80 acres (for black-tailed prairie dogs) or 200 acres (for white-tailed and Gunnison's prairie dogs).

The **Southwestern Willow Flycatcher** (ESA-endangered, NESL-group 2, MBTA) inhabits thickets, riparian woodlands, pastures, and brushy areas. At low elevations, dense willow, cottonwood, and tamarisk thickets and woodland along streams and rivers are considered habitat, and (at high elevations) pure, streamside stands of Geyer willow are preferred.

The **Golden Eagle** (NESL-group 3, MBTA, EPA) inhabits open country from barren areas to open coniferous forests. They are primarily found in hilly and mountainous regions, but also in rugged deserts, on the plains, and in tundra. The golden eagle prefers cliffs and large trees with large horizontal branches and for roosting and perching. The golden eagle nests on cliff ledges, preferably overlooking grasslands; 10 to 100' above ground in dead or live trees; in artificial structures; or on the ground. In western mountains, golden eagles nest at elevations of 4,000 to 10,000'. Pairs may use the same nest year after year or use alternate nests in successive years. Golden eagles are most likely to use trees for nesting if cliff sites are unavailable. The golden eagle generally forages in open habitats where rabbits and small rodents are available. During the nesting season the golden eagle usually forages within 4.4 miles (7 km) of the nest. Trees, live or dead, are often used for perches if they are near open areas where prey can be easily seen.

The **Mountain Plover** (NESL-group 4, ESA-candidate, MBTA) is generally considered an inhabitant of the arid short-grass prairie, which is dominated by blue grama and buffalo grass with scattered clumps of cacti and forbs. More recently it has been considered a disturbed-prairie or a semi-desert species. Mountain plovers are very selective in choosing nest sites, preferring expansive, arid flats with very short grass and

a high proportion of bare ground. In parts of its breeding range, the mountain plover selectively nests in prairie dog towns. Prairie dogs create unique patches of habitat ideal for mountain plovers. In short-grass prairie, prairie dog grazing promotes the short grasses like buffalo grass and grama grasses, and their digging creates areas of bare soil important for plover nesting. Prairie dog towns also attract many species of insects. Mountain plovers will forage on slopes and ridges. Adults with young have been observed in tall vegetation and around livestock watering facilities, which probably provide an abundance of insects. Adults also use plowed fields.

**Ferruginous Hawks** (NESL-group 3, MBTA) are found in open habitats, such as grasslands, shrub steppes, sagebrush, deserts, saltbush-greasewood shrublands, and outer edges of piñon -pine and other forests. It nests in small trees or rock outcrops or on the ground or haystacks if no other site is available. Generally, they avoid high elevations, narrow canyons, and interior regions of forests. Trees, utility poles and towers, fence posts, rocky outcrops, cliffs, and the ground are perching substrates used by ferruginous hawks.

The **Western Burrowing Owl** (MBTA) is found primarily in dry, short-grass prairie, in association with burrowing mammals particularly prairie dogs, ground squirrels and badgers. Burrowing Owls nest underground in abandoned burrows dug by mammals or if soil conditions allow they will dig their own burrows.

The **Northern Leopard Frog** was once widely distributed across much of the United States and Canada. Since the 1970's however, declines of leopard frogs have been documented from every state in the Rocky Mountain region and large parts of Canada. This species reaches the southern extent of its range in central Arizona and New Mexico. The northern leopard frog is found in all water types found in association with open meadows and grasslands (e.g., lakes, ponds, rivers, stock tanks, springs, streams, large and small wetlands, even homemade ponds). Leopard frogs move considerable distances from water especially in wet grasslands or damp woodlands (USGS web-site 2000).

Waterfowl and Shorebirds will be found in close proximity to wetlands and watercourses.

*The cultural history of the area is defined in this sub-section by the following periods:*

- *Paleo-Indian Period*
- *Archaic Period*
- *Basketmaker II-III Period*
- *Anasazi Period*
- *Pueblo IV Period*
- *Spanish Period*
- *American Period*

## **1.2 Cultural Resources**

Cultural resources are defined as objects, structures, locations, or natural features that reflect the culture of a human group. Protection of cultural resources is granted under several management procedures, laws, statutes, and amendments, including the National Historic Preservation Act of 1966, as amended; the Archaeological and Historic Preservation Act of 1974; the Archaeological Resources Protection Act of 1979; the American Indian Freedom of Religion Act; and the Native American Graves Protection and Repatriation Act. Cultural resources are evaluated by professionals for their potential of inclusion on the National Register of Historic Places. The criteria used to evaluate these resources are as follows:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) are associated with the lives of persons significant in our past; or (c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or possess high artistic values, or represent a significant distinguishable entity whose components may lack individual distinction; or (d) have yielded or may be likely to yield information important in history or prehistory.

The following discussion is intended to provide an overview of human development in the region. Existing data on the project sites are discussed in detail in the following section; the information provided below is intended to provide the reader with a general overview of cultural resources in the region.

### **Paleo-Indian Period**

This period, which came to an end around 6,000 B.C., was composed of the Clovis, Folsom, and Cody cultures. Artifacts from this time period indicate that these cultures hunted large mammals, such as mammoth, horse, and camel following these herds across the land.

### **Archaic Period**

The Archaic period lasted from between around 6,000 B.C. to around 400 B.C. The human groups of the Southwest hunted bison, deer, and smaller mammals and gathered seeds and plants. Gradually, these populations began to settle in more permanent locations, and there is evidence of primitive attempts to cultivate such plants as corn and squash.

### **Basketmaker II-III Period**

This period lasted from around 400 B.C. to about 700-750 A.D. Populations became much more sedentary than in previous periods, living often in small settlements of semi-buried pithouses under large rock overhangs. They wove baskets, clothing, and many other personal goods out of fibers, grew much of their own food, and hunted game (Ferguson and Rohn 1987). Continuing human development led to the Basketmaker III culture, beginning about 400 A.D. It is characterized by "pithouse villages, ceramics, the bow and arrow, and some large structures" that would eventually be replaced by great kivas.

### **Anasazi Period**

The name Anasazi originated from the Navajo, which today is popularly translated as "the ancient ones" but is more accurately translated as "ancient enemies". For their part, the Hopi and Zuni, who claim direct ancestry to the Anasazi, use the names Hisatsinon and Enote, respectively for Anasazi. The Anasazi culture is divided into three separate periods, as follows: Pueblo I (700-900), Pueblo II (900-1100), and Pueblo III (1100-1300). During these periods, cultures advanced in social organization, architecture, irrigation, horticulture, pottery, trade, and communication. Examples of these eras include the Cliff Palace in Mesa Verde and Pueblo Bonito in Chaco Canyon. In the last 20 years, an impressive network of roads, often 30' wide and running in straight lines in defiance of local topography, have been discovered that emanate from Chaco Canyon to numerous outlier sites.

The Anasazi culture began a long period of decline between the mid-1100's and 1300. Evidence appears to indicate that long periods of drought accompanied by human-induced environmental damage brought an end

to the Anasazi culture. People gradually migrated out of today's Four Corners region and left it virtually devoid of inhabitants. Their destination often was to the south and west, where they most probably mixed with local populations to create the Acoma, Zuni, and Hopi peoples of today – who claim affinity to the Anasazi. The migrations legends of the Zuni and Hopi relate how their member clans migrate for many years throughout the Anasazi region in their quests to find the final homes they believe their gods destined them to have.

#### **Pueblo IV Period**

Pueblo IV defines the period between the end of the Anasazi culture and the entrance into the Southwest from Mexico of the first Spanish conquistadors in 1540 led by Francisco Vasquez de Coronado. Perhaps because of deteriorating environmental conditions, warfare, or other reasons, the regional populations declined by as much of half over the Pueblo IV period (LeBlanc 1989). Local populations in Acoma and Zuni left many smaller pueblos and congregated in larger ones of hundreds of rooms (Cordell and Gumerman 1989). Trade did flourish throughout an extensive region, and the Acoma and Zuni area may have served a middleman role between the Hohokam culture in southern Arizona and the pueblos along the northern Rio Grande (LeBlanc 1989).

It was during this period that the Navajo likely migrated into northwestern New Mexico. Various authorities have estimated the timing of Navajo entry into the area to be as early as 1000 and as late as 1525. It is reasonably certain that the Navajos, members of the Apachean tribes, who in turn were associated with the Athapaskan culture, were at least on the northern periphery of the Anasazi region around 1300.

The Navajo were nomadic people who apparently migrated along the Rocky Mountains from much further north and may have been joined by smaller numbers of their kinsman from California. This migration could have begun a thousand years ago and involved lengthy processes in which small bands were on the move, eventually settling throughout much of the Southwest (Locke 1992; Brugge 1983). Upon reaching the Four Corners region, they stopped their migration and took up a nomadic lifestyle within the region. They began

borrowing various attributes of the indigenous Indians' cultures. Little is know about the Navajo during this time.

### **Spanish Period**

The Spanish conquistadors, who arrived in 1540 and returned intermittently until the end of the century, constituted the “shock troops” of cultural change to Native American societies in the Southwest. The Spanish made their presence permanent in northern New Mexico with the 1598 expedition of Juan de Onate, who brought 400 soldiers, colonists, priests, and servants to colonize the upper Rio Grande Valley and convert the Indian to Christianity (Simmons 1979). Oñate implemented harsh measures against those tribes who opposed his attempt to establish Spanish dominion over the region.

In the ensuing century, the Spanish instituted their control over the region and its indigenous population. Frustrated in their search for the gold and silver of their legends, the Spanish turned to ranching, trading with the Indians, spreading the faith, and generally trying to settle the region. The Spanish introduced sheep, cattle, and horse to the Southwest. Almost all pueblos suffered substantial population declines because of battles with the Spanish and the Navajo, susceptibility to European diseases, and famines (Simmons 1979).

Due to the influx of the Spanish into the region, the Navajo and Pueblos created a loose union during the Pueblo revolts of 1680 and 1696. The Navajos learned the Pueblo technique of building in stone, a construction material they had not previously used. As they came into more contact with the Spanish, the Navajo began raiding Spanish settlements along with those of the Pueblos. This brought them increased herds along with Spanish and Pueblo goods. In retaliation, the Spanish and Pueblos made slave raids into Navajo country, capturing women and children. One brutal Spanish Military raid massacred the Navajo women and children in Canyon de Chelly during the winter of 1804-1805. When Mexico declared its independence from Spain in 1821, the military presence disintegrated in the Southwest, and raiding between Navajos, Pueblos and Spanish settlers became much more widespread during the first half of the 19th century.



### **American Period**

The American period began in 1846 with the occupation of the Southwest by American military forces and the establishment of American civil government. The traditional, agrarian society of the Spanish and, briefly, Mexicans was replaced by a far more vibrant, commercial, anti-status quo American culture committed to the precepts of Manifest Destiny.

In 1846, General Brigadier Stephen Watts Kearny defeated the Mexican Army in New Mexico and proclaimed the beginning of the American Revolution. During negotiations with the Navajo, the Americans mistakenly killed Chief Narbona of the Navajos, which led to intense raids on Anglo-American settlements from 1846-1850. In response, the U.S. Army established Fort Defiance in 1851 at the center of Navajo country. In 1862, the Indian scout, Kit Carson, formed a volunteer army to fight the Navajos. He had little difficulty finding recruits due to the number of settlements the Navajo had raided. Carson was ruthless and successful in his strategy of destroying the Navajo's food supply and starving them.

After the Navajos surrendered, General James Carleton devised a plan that forced the tribe to walk to Fort Sumner to be taught a stationary, agriculturally-based way of life. While few deaths occurred during the roundup of Navajos, many died at Fort Sumner and during the hardships of the ensuing Long Walk in 1864. Almost overnight, the Navajos were transformed from the strongest, richest group in the Southwest to near-starvation.

*Seven potential sites have been identified for future development of housing in the Chapter.*

#### *Site 1*

*Based on the initial inspection of existing environmental data, this parcel has a medium suitability for development.*

*The file search indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted adjacent to the east of the parcel and one previously recorded archaeological site, a Basketmaker III habitation, has been noted about 200' east of the site. The number and density of sites found adjacent to the housing site is not thought to be particularly high. Based on the discovery to the east of the site, it can be estimated that the housing site could contain similar types of sites.*

## **2.0 Analysis of Sites**

Seven potential sites have been identified for future development of housing in the Chapter. Sites are shown in Exhibits 13a-13g.

- Site 1 - located across US 666 from the Chapter house, west of the senior center now under construction.
- Site 2 - *eliminated from consideration*
- Site 3 - located immediately east of the existing NHA subdivision on the south side of N19.
- Site 4 - located approximately 2 miles south of the Chapter house on the east side of U.S. 666.
- Site 5 - *eliminated from consideration*
- Site 6 - located on the southside of N9, approximately 2 miles from U.S. 666 junction.
- Site 7 - located east of Tohlakai on tribal trust land, surrounded by allotted land.

### **2.1 Site 1: Geology/Soils**

The proposed housing site lies about 6,400 feet above sea level. A sandstone rock outcrop and knoll are found along the southern boundary of the site. An abandoned sewage disposal pond for the BIA school lies directly west of the site.

Soils (refer to soil maps in Appendix F2) have been classified into three groups:

- Doakum-Windwhistle complex;
- Windwhistle-Bond-Farview complex; and,
- Yenlo-Silver complex.

The *Doakum-Windwhistle complex* is very deep to moderately deep aeolian or alluvial material derived from sandstone and shale. This complex makes up about 1 percent of the housing site. It is considered well-drained to somewhat excessively drained. It is characterized by very low to medium surface runoff with a moderate hazard of water erosion, as well as a moderate to very severe hazard for blowing soil.

The *Windwhistle-Bond-Farview complex* is very shallow to moderately deep aeolian and alluvial material derived from sandstone and/or shale. This complex makes up about 9 percent of the housing site. It is well drained to somewhat excessively drained. It is characterized by very low to medium surface runoff with a moderate hazard of water erosion. However, it has a very severe to severe hazard for blowing soil.

The *Yenlo-Silver complex* is very deep alluvial material derived from sandstone and/or shale. This complex makes up about 90% of the housing site. It is considered well-drained. It is characterized by low to very high surface runoff with a moderate hazard of water erosion and blowing soil.

### **Surface Water/Drainage**

A water system of some sort (well or spring) is found on top of the knoll and on the southwest corner of the knoll (outside the study area). This water source appears to be used for domestic livestock in the area. No wetlands or well-defined drainages were noted during the site visit.

### **Vegetation**

The study area is found within desert grassland biome and is dominated by grama grass, snakeweed, rabbitbrush and four-wing saltbush.

### **Wildlife**

Wildlife that occupies the study area is expected to be typical of desert grassland habitat. Evidence of prairie dogs, coyotes, jack-rabbits, rodents, and ravens were seen during the site visit. It can be expected that other animals such as foxes, lizards, snakes, small rodents, and birds of prey could also be a common resident of the study area.

### **Environmentally Sensitive Areas**

Environmentally sensitive areas can include such areas as designated habitat for threatened and endangered species, important wildlife areas or corridors, riparian areas, and protected plant populations. The Navajo Natural Heritage Program maintains records of this information that is available to the Navajo Nation. A letter was sent to the Navajo Natural Heritage Program requesting data on known environmentally sensitive

areas that may be affected by the proposed housing sites.

At this time no known species of concern has been recorded in the area which is part of the database kept by the Navajo Natural Heritage Program. As of May 2000, the following list of species of concern has been identified that could potentially be affected by the proposed undertaking:

- Black-footed Ferret (potential habitat)
- Golden Eagle (potential foraging habitat)
- Ferruginous Hawk (potential nesting and foraging habitat)
- Mountain Plover (potential habitat)
- Western Burrowing Owl (potential habitat)
- Mule Deer (potential marginal habitat)
- Mexican Spotted Owl (no habitat present)

No vegetation of concern were identified.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report does not satisfy survey requirements of the Navajo Nation or the Endangered Species Act and is not intended to represent an intensive survey of threatened or endangered species within the study area. Additional consultation with the Navajo Nation Natural Heritage Program would be necessary prior to development because species are continually added and subtracted from their list of species of concern, new data may become available, or new survey protocol may be established between now and the time of development.

### **Culturally Significant Areas/Traditionally Sensitive Areas**

The file search conducted for this site indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted adjacent to the east of the parcel and one previously recorded archaeological site, a Basketmaker III habitation, has been noted about 200 feet east of the site. The number and density of sites found adjacent to the housing site is not thought to be particularly high.

Based on the discovery to the east of the site, it can be estimated that the housing site could contain similar types of sites.

There were no traditional cultural properties identified within the site.

The literature review and assessment of previous cultural resource surveys is intended to provide a summary of the current information that is on file with the Navajo Nation Historic Preservation Department and the Museum of New Mexico Archaeological Records Management Section. The report does not satisfy Section 106 survey requirements of the National Historic Preservation Act and is not intended to represent an intensive survey of cultural resources within the study areas. The Navajo Nation Historic Preservation Officer would require additional survey for the parcel prior to implementing development activities. Consultation with the Navajo Historic Preservation Officer would be necessary prior to development of this parcel.

### Site 3

*Based on the initial inspection of existing environmental data, this parcel has a medium suitability for development.*

*The file search conducted for this site indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted adjacent to the east of the parcel and one previously recorded archaeological site, a Basketmaker III artifact scatter, has been noted about 300' south of the site. The number and density of sites found estimated that the housing site could contain similar types of sites. Based on the discovery to the east of the site, it can be estimated that the housing site could contain similar types of sites.*

### Recommendations

Based on the initial inspection of existing environmental data, this parcel has a medium suitability for development. Additional threatened and endangered species and cultural resource investigations on the parcel would be required which would add cost to the design element, as well as the need to develop a plan for any discovered cultural resources.

#### 2.2 Site 2:

This site has been eliminated from consideration. It has been changed to a business site.

#### 2.3 Site 3:

##### Geology/Soils

The proposed housing site slopes gently from about 6,300 feet above sea level in the northeast corner to about 6,360 feet above sea level in the southeast corner. A depression that consumes about 15 percent of the western portion of the housing site was noted during the survey, which lies adjacent to the HUD housing. It would require large amounts of fill to develop this depression area. Although the site is relatively undisturbed, development can be found to the west of the housing site.

Soils (refer to soil maps in Appendix F2) have been classified into three groups:

- Jeddito loamy fine sand;
- Doakum-Windwhistle complex; and,
- Yenlo-Silver complex.

The *Jeddito* fine loamy sand is very deep alluvial material derived from sandstone and shale. This complex makes up about 30 percent of the housing site. It is considered well drained. It is characterized by low surface runoff with a slight hazard of water erosion. However, it has very severe hazard for blowing soil.

The *Doakum-Windwhistle complex* is very deep to moderately deep aeolian or alluvial material derived from sandstone and shale. This complex makes up about 50% of the housing site. It is considered well-drained to somewhat excessively drained. It is characterized by very low to medium surface runoff with a moderate hazard of water erosion, as well as a moderate to very severe hazard for blowing soil.

The *Yenlo-Silver complex* is very deep alluvial material derived from sandstone and/or shale. This complex makes up about 20% of the housing site. It is considered well-drained. It is characterized by low to very high surface runoff with a moderate hazard of water erosion and blowing soil.

### **Surface Water/Drainage**

No wetlands or well-defined drainages were noted during the survey. The depression area on the western boundary undoubtedly collects water during storm events that drains from the HUD development.

### **Vegetation**

The study area is found within desert grassland biome and is dominated by sagebrush community consisting primarily of Indian ricegrass, grama grass, snakeweed, and rabbitbrush.

### **Wildlife**

Wildlife that occupies the study area is expected to be typical of desert grassland habitat. Evidence of prairie dogs, coyotes, jack-rabbits, rodents, and ravens were seen during the site visit. It can be expected that other

animals such as foxes, lizards, snakes, small rodents, and birds of prey could also be a common resident of the study area.

### **Environmentally Sensitive Areas**

Environmentally sensitive areas can include such areas as designated habitat for threatened and endangered species, important wildlife areas or corridors, riparian areas, and protected plant populations. The Navajo Natural Heritage Program maintains records of this information that is available to for the Navajo Nation. A letter was sent to the Navajo Natural Heritage Program requesting data on known environmentally sensitive areas that may be affected by the proposed housing sites.

At this time, no known species of concern has been recorded in the area which is part of the database kept by the Navajo Natural Heritage Program. As of May 2000, the following list of species of concern was identified that could potentially be affected by the proposed undertaking:

- Black-footed Ferret (potential habitat)
- Golden Eagle (potential foraging habitat)
- Ferruginous Hawk (potential nesting and foraging habitat)
- Mountain Plover (potential habitat)
- Western Burrowing Owl (potential habitat)
- Mule Deer (potential marginal habitat)
- Mexican Spotted Owl (no habitat present)

No vegetation of concern were identified.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report does not satisfy survey requirements of the Navajo Nation or the Endangered Species Act and is not intended to represent an intensive survey of threatened or endangered species within the study area. Additional consultation with the Navajo Nation Natural Heritage Program would be necessary prior to development because species are continually added and subtracted from their list of species of concern, new data may become available, or new survey protocol may be established between now and the time

#### Site 4

*Based on the initial inspection of existing environmental data, this parcel has medium suitability for development. Although not insurmountable, the archaeological site located in the northwestern and central portions of this site will make it a little more difficult to develop.*

*The site file search conducted for this housing site revealed three previous surveys and reports that identified one previously recorded archaeological site at the southwestern corner of this site. The three previous studies were all related to the widening of US 666 from Ya-ta-hey to Tohatchi. This cultural resources site is considered a Pueblo I-II small residence and a historic Navajo artifact scatter with features. This site was considered eligible for inclusion on the National Register of Historic Places.*

of development.

#### **Culturally Significant Areas/Traditionally Sensitive Areas**

The file search conducted for this site indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted adjacent to the east of the parcel and one previously recorded archaeological site, a Basketmaker III artifact scatter, has been noted about 300 feet south of the site. The number and density of sites found adjacent to the housing site is not thought to be particularly high. Based on the discovery to the east of the site, it can be estimated that the housing site could contain similar types of sites.

There were no traditional cultural properties identified within the site.

The literature review and assessment of previous cultural resource surveys is intended to provide a summary of the current information that is on file with the Navajo Nation Historic Preservation Department and the Museum of New Mexico Archaeological Records Management Section. The report does not satisfy Section 106 survey requirements of the National Historic Preservation Act and is not intended to represent an intensive survey of cultural resources within the study areas. The Navajo Nation Historic Preservation Officer may require an additional survey for the parcel prior to implementing development activities. Consultation with the Navajo Historic Preservation Officer would be necessary prior to development of this parcel.

#### **Recommendations**

Based on the initial inspection of existing environmental data, this parcel has medium suitability for development. Additional threatened and endangered species and cultural resource investigations on the parcel would be required which would add cost to the design element, as well as the need to develop a plan for any discovered cultural resources.

#### **2.4 Site 4: Geology/Soils**

The proposed housing site runs along the west side of US 666 from a knoll 6,400 feet above sea level in the



northern boundary of the parcel, to a drainage area that delineates the southern boundary. Scattered residential housing is found northeast of the housing site.

Soils (refer to soil maps in Appendix F2) have been classified into two groups:

- Windwhistle-Bond-Farview complex, and
- Yenlo-Silver complex.

The *Windwhistle-Bond-Farview complex* is very shallow to moderately deep aeolian and alluvial material derived from sandstone and/or shale. This complex makes up about 20% of the housing site. It is well-drained to somewhat excessively drained. It is characterized by very low to medium surface runoff with a moderate hazard of water erosion. However, it has a very severe to severe hazard for blowing soil.

The *Yenlo-Silver complex* is very deep alluvial material derived from sandstone and/or shale. This complex makes up about 80% of the housing site. It is considered well drained. It is characterized by low to very high surface runoff with a moderate hazard of water erosion and blowing soil.

### **Surface Water/Drainage**

No wetlands or well-defined drainages were noted during the survey.

### **Vegetation**

The study area is found within desert grassland biome and is dominated by grama grass, snakeweed, rabbitbrush, four-wing saltbush, and sage.

### **Wildlife**

Wildlife that occupies the study area is expected to be typical of desert grassland habitat. Evidence of jack-rabbits, rodents, and ravens were seen during the site visit. It can be expected that other animals such as coyotes, prairie dogs, foxes, lizards, snakes, small rodents, and birds of prey could also be a common resident of the study area.

### **Environmentally Sensitive Areas**

Environmentally sensitive areas can include such areas as designated habitat for threatened and endangered

species, important wildlife areas or corridors, riparian areas, and protected plant populations. The Navajo Natural Heritage Program maintains records of this information that is available to the Navajo Nation. A letter was sent to the Navajo Natural Heritage Program requesting data on known environmentally sensitive areas that may be affected by the proposed housing sites.

At this time no known species of concern has been recorded in the area which is part of the database kept by the Navajo Natural Heritage Program. As of May 2000, the following list of species of concern was identified that could potentially be affected by the proposed undertaking:

- Black-footed Ferret (potential habitat)
- Golden Eagle (potential foraging habitat)
- Ferruginous Hawk (potential nesting and foraging habitat)
- Mountain Plover (potential habitat)
- Western Burrowing Owl (potential habitat)
- Mule Deer (potential marginal habitat)
- Mexican Spotted Owl (no habitat present)

No vegetation of concern were identified.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report does not satisfy survey requirements of the Navajo Nation or the Endangered Species Act and is not intended to represent an intensive survey of threatened or endangered species within the study area. Additional consultation with the Navajo Nation Natural Heritage Program would be necessary prior to development because species are continually added and subtracted from their list of species of concern, new data may become available, or new survey protocol may be established between now and the time of development.

#### **Culturally Significant Areas/Traditionally Sensitive Areas**

The site file search conducted for this housing site revealed four previous surveys and reports that identified

## Site 6

*Based on the initial inspection of existing environmental data, this parcel has medium to low suitability for development. Although not insurmountable, the archaeological sites located on this site will make it more difficult to develop.*

*Twenty percent of this site has been crossed by several linear investigations resulting in the recording of four cultural resources located in the center of the project. The four sites include:*

- *a Pueblo II habitation,*
- *a Navajo homestead dating to around 1920s and/or 1930s,*
- *a Pueblo II artifact scatter,*
- *and an Anasazi artifact scatter.*

*All but the Navajo homestead have been recommended for inclusion on the National Register of Historic Places.*

*Other nearby linear surveys have also encountered an apparently high frequency of archaeological sites.*

three previously recorded archaeological site at the southwestern corner of this site. Three of the previous studies were related to the widening of Highway 666 from Ya-ta-hey to Tohatchi (Francisco 1994, Blinman 1997, and Blinman 1988). Two archaeological sites were recorded in these studies. Both of these sites are Puebloan habitations and are considered significant and eligible for protection under the National Historic Preservation Act and the Archaeological Resources Protection Act. The third archaeological site is a recent trash dump located at the southern end of the proposed development site and was recommended by Copeland (1994) as not being significant and not needing any further protection.

There were no traditional cultural properties identified within the site.

### **Recommendations**

Based on the initial inspection of existing environmental data, this parcel has a medium suitability for development. Additional threatened and endangered species and cultural resource investigations on the parcel would be required which would add cost to the design element, as well as the need to develop a plan for any discovered cultural resources. Although not insurmountable, the archaeological sites located in the northwestern and central portions of this site will make this site a little more difficult to develop. Consultation and coordination with Departments in Window Rock (particularly the Navajo Historic Preservation Office) would be necessary prior to approval for development of this site.

### **2.5 Site 5:**

Site has been eliminated from consideration.

### **2.6 Site 6: Geology/Soils**

The proposed housing site slopes gently from about 6,260 feet above sea level in the southern corner to about 6,160 feet above sea level in the northern corner. A depression that consumes about 1% of the housing site was noted during the survey, which lies on the south side of Navajo Route 9 near the center of the housing site.

Soils have been classified as the *Doak-Shiprock complex*, and are very deep aeolian and alluvial material derived from sandstone or shale. Soil maps are shown in Appendix 2.0. It is considered somewhat excessively to well-drained with a low to moderate shrink/swell potential. It is characterized by very low to medium surface runoff with a moderate hazard of water erosion. However, it has a severe hazard for blowing soil.

### **Surface Water/Drainage**

No wetlands or well-defined drainages were noted during the survey. The depression noted in the center of the housing site most likely collects runoff from storm events and could be used by domestic livestock in the area.

### **Vegetation**

The study area is found within desert grassland biome and is dominated by galleta, snakeweed, rabbitbrush, four-wing saltbush, and sage.

### **Wildlife**

Wildlife that occupies the study area is expected to be typical of desert grassland habitat. Evidence of prairie dogs, coyotes, jack-rabbits, and rodents were seen during the site visit. It can be expected that other animals such as foxes, lizards, snakes, small rodents, ravens, and birds of prey could also be a common resident of the study area.

### **Environmentally Sensitive Areas**

Environmentally sensitive areas can include such areas as designated habitat for threatened and endangered species, important wildlife areas or corridors, riparian areas, and protected plant populations. The Navajo Natural Heritage Program maintains records of this information that is available to for the Navajo Nation. A letter was sent to the Navajo Natural Heritage Program requesting data on known environmentally sensitive areas that may be affected by the proposed housing sites.

At this time no known species of concern has been recorded in the area which is part of the database kept by the Navajo Natural Heritage Program. As of May 2000, the following list of species of concern was

identified that could potentially be affected by the proposed undertaking:

- Black-footed Ferret (potential habitat)
- Golden Eagle (potential foraging habitat)
- Peregrine Falcon (potential foraging habitat)
- Ferruginous Hawk (potential nesting and foraging habitat)
- Mountain Plover (potential habitat)
- Northern Leopard Frog (no habitat present)
- Waterfowl and Shorebirds (no habitat present)

No vegetation of concern were identified.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report does not satisfy survey requirements of the Navajo Nation or the Endangered Species Act and is not intended to represent an intensive survey of threatened or endangered species within the study area. Additional consultation with the Navajo Nation Natural Heritage Program would be necessary prior to development because species are continually added and subtracted from their list of species of concern, new data may become available, or new survey protocol may be established between now and the time of development.

### **Culturally Significant Areas/Traditionally Sensitive Areas**

This site has been crossed by several linear investigations resulting in the recording of four cultural resources. The previous investigations encompassed about 20% of the housing site and were conducted for a water supply line (U.S. Bureau of Reclamation 1976), a water and sewer line system associated with a Twin Lakes HUD housing project (Miner 1989 and 1996), and a telephone cable (Michalik 1992). The four sites include a Pueblo II habitation, a Navajo homestead dating to around 1920s and/or 1930s, a Pueblo II artifact scatter, and an Anasazi artifact scatter. All but the Navajo homestead have been recommended as eligible for inclusion on the National Register of Historic Places. The eligibility for the homestead to be included on the Register is unknown. These four sites are located

throughout the center of the project, making avoidance slightly more difficult.

Other nearby linear surveys have also encountered an apparently high frequency of archaeological sites. Depending on the actual size of the proposed development, it may be possible to avoid most of the existing cultural resources. However, the nature and extent of the other nearby sites, located in similar topographic environments, suggests a likelihood of encountering additional significant cultural resources in this area.

There were no traditional cultural properties identified within this site.

The literature review and assessment of previous cultural resource surveys is intended to provide a summary of the current information that is on file with the Navajo Nation Historic Preservation Department and the Museum of New Mexico Archaeological Records Management Section. The report does not satisfy Section 106 survey requirements of the National Historic Preservation Act and is not intended to represent an intensive survey of cultural resources within the study areas. The Navajo Nation Historic Preservation Officer may require additional survey for the parcel prior to implementing development activities. Consultation with the Navajo Historic Preservation Officer would be necessary prior to development of this parcel.

### **Recommendations**

Based on the initial inspection of existing environmental data, this parcel has medium to low suitability for development. Additional threatened and endangered species and cultural resource investigations on the parcel would be required which would add cost to the design element, as well as the need to develop a plan for any discovered cultural resources. Although not insurmountable, the archaeological sites located on this site will make this site more difficult to develop. A considerable amount of consultation and coordination with Departments in Window Rock (particularly the Navajo Historic Preservation Office) would be necessary prior to approval for development.

## Site 7

*Based on the initial inspection of existing environmental data, this parcel has medium suitability for development.*

*The file search conducted for this site indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted near the study area and one previously recorded archaeological site, a large Puebloan site, has been noted several hundred feet south of the site. The number and density of sites found adjacent to the housing site is not thought to be particularly high. Based on the discovery to the south of the site, it can be estimated that the housing site could contain similar types of sites.*

## 2.7 Site 7 Geology/Soils

The proposed housing site slopes gently from about 6,380 feet above sea level in the northeastern corner to about 6,350 feet above sea level in the southwestern corner.

Specific soil types are unknown at this time.

### Surface Water/Drainage

Two unnamed drainages cross through the project area in the northwestern quadrant.

### Vegetation

The study area is found within desert grassland biome and is dominated by galleta, snakeweed, rabbitbrush, four-wing saltbush, and sage.

### Wildlife

Wildlife that occupies the study area is expected to be typical of desert grassland habitat. It can be expected that animals such as prairie dogs, coyotes, jack-rabbits, foxes, lizards, snakes, small rodents, ravens, and birds of prey would be common residents of the study area.

### Environmentally Sensitive Areas

Environmentally sensitive areas can include such areas as designated habitat for threatened and endangered species, important wildlife areas or corridors, riparian areas, and protected plant populations. The Navajo Natural Heritage Program maintains records of this information that is available to for the Navajo Nation. A letter was sent to the Navajo Natural Heritage Program requesting data on known environmentally sensitive areas that may be affected by the proposed housing sites.

At this time no known species of concern has been recorded in the area which is part of the database kept by the Navajo Natural Heritage Program. As of May 2000, the following list of species of concern was identified that could potentially be affected by the proposed undertaking:

- Black-footed Ferret (potential habitat)
- Golden Eagle (potential foraging habitat)

- Peregrine Falcon (potential foraging habitat)
- Ferruginous Hawk (potential nesting and foraging habitat)
- Mountain Plover (potential habitat)
- Mexican Spotted Owl (no habitat present)
- Northern Leopard Frog (no habitat present)
- Waterfowl and Shorebirds (no habitat present)

No vegetation of concern were identified.

The data request and assessment of species of concern is intended to provide a summary of the current information that is on file with the Navajo Nation Natural Heritage Program. The report does not satisfy survey requirements of the Navajo Nation or the Endangered Species Act and is not intended to represent an intensive survey of threatened or endangered species within the study area. Additional consultation with the Navajo Nation Natural Heritage Program would be necessary prior to development because species are continually added and subtracted from their list of species of concern, new data may become available, or new survey protocol may be established between now and the time of development.

### **Culturally Significant Areas/Traditionally Sensitive Areas**

The file search conducted for this site indicated no previous surveys and no previously recorded cultural resources. Several projects have been conducted nearby the study area and one previously recorded archaeological site, a large Puebloan site, has been noted several hundred feet south of the site. The number and density of sites found adjacent to the housing site is not thought to be particularly high. Based on the discovery to the south of the site, it can be estimated that the housing site could contain similar types of sites.

There were no traditional cultural properties identified within the site.

The literature review and assessment of previous cultural resource surveys is intended to provide a summary of the current information that is on file with the Navajo Nation Historic Preservation Department and the Museum of



New Mexico Archaeological Records Management Section. The report does not satisfy Section 106 survey requirements of the National Historic Preservation Act and is not intended to represent an intensive survey of cultural resources within the study areas. The Navajo Nation Historic Preservation Officer would require additional survey for the parcel prior to implementing development activities. Consultation with the Navajo Historic Preservation Officer would be necessary prior to development of this parcel.

### **Recommendations**

Based on the initial inspection of existing environmental data, this parcel has a medium suitability for development. Additional threatened and endangered species and cultural resource investigations on the parcel would be required which would add cost to the design element, as well as the need to develop a plan for any discovered cultural resources.

The presence of two well-defined drainages through the parcel will require consultation with the U.S. Army Corps of Engineers. At a minimum, this will require a wetland delineation and jurisdictional waters determination. This adds another layer of agency involvement and added cost to the design element of this parcel.

### ***E. Land Use Plan***

The Land Use Plan for Twin Lakes chapter is comprised of three sections:

- E1. Recommendations
- E2. Implementation
- E3. Land Use Map/Site Maps.

## **E1. Recommendations**

This section contains a description of the recommended housing sites as shown in Exhibits 13a - 13g (Exhibits 13b and 13e have been eliminated).

*Based on existing and future housing needs, the Chapter will need to build an additional 240 houses to meet current and future needs by 2010.*

*The Chapter proposes both clustered and scattered housing to be developed.*

*Sites 3, 7, and 1 are the highest ranking sites based on data reported in the Infrastructure Analysis and Suitability Analysis sections.*

As reported in the Community Assessment section, a 1997 estimate by Navajo Nation Community Development Department lists 495 occupied housing units in the Chapter. The consultant estimates 545 total units. Of the total housing units, 65 units were constructed by NHA. In addition, NHA houses built during the late 1960s and 1970s were recently remodeled.

The most current waiting list prepared by NHA shows a need for 27 public rental, 4 homeowner, and 1 scattered unit. The Chapter has compiled a waiting list of 177 individuals who need new housing.

Based on existing and future housing needs, the Chapter will need to build between 95 and 240 houses to meet current and future needs by 2010. NHA currently proposes to build three scattered site houses in the Chapter.

The Chapter proposes both clustered and scattered housing to be developed. Seven sites have been proposed and presented to the community as part of the Public Participation Process. Two of the sites were determined to be unsuitable and have been eliminated. The sites are compared for suitability in Exhibit 11. The sites are:

- Site 1: West of the old Boarding School tract (medium suitability)
- Site 2: *Site has been eliminated*
- Site 3: East of current subdivision, along Rt.19 on south side (high suitability)
- Site 4: South on US 666 on east side (medium suitability)
- Site 5: *Site has been eliminated*
- Site 6: East on Rt.9, near Coyote Canyon boundary (medium suitability)
- Site 7: Tohlakai Road (high suitability).

Sites 3, 7, and 1 are the highest ranking sites based on data reported in the Infrastructure Analysis and Suitability Analysis sections.

## Exhibit 11: Housing Sites Ranking

## **E2. Implementation**

*A number of planning policies have been identified to implement the land use plan:*

A number of planning policies have been identified to implement the land use plan. They are described in this sub-section. References to future land use are shown in Exhibit 12.

*Policy 1: Preserve significant natural and cultural resources*

**Policy 1.** Preserve the scenic landscape, forested mesas, riparian areas, and open spaces of the Chapter.

*Policy 2: Develop appropriate housing projects*

1a. Identify sites for potential development that have the least impact on the landscape.

*Policy 3: Promote housing to meet the entire community's needs*

1b. Prohibit development on steep slopes, or in floodplains or in areas of poor soils, or natural and cultural significance.

*Policy 4: Create local business opportunities*

1c. Limit the height of all structures, including signs.

*Policy 5: Identify business locations*

1d. Designate protected areas where development is restricted:

- Navajo Tribal Forest
- Chuska Mountains
- Bass Lake.

*Policy 6: Identify community facility locations and funding*

**Policy 2.** Develop housing projects appropriate to the community's needs.

*Policy 7: Identify land use procedures*

2a. Encourage clustered housing development (not necessarily subdivisions).

*Policy 8: Use master leasing*

2b. Scattered housing sites should be located in areas near existing/planned infrastructure.

*Policy 9: Continue grazing*

2c. Streamline homesite approval process.

*Policy 10: Define Chapter boundaries*

2d. Promote the use of alternative technologies:

- solar
- windmills
- cisterns and water collection
- constructed wetlands.

2e. The Chapter, working with NHA, will develop design guidelines for new housing areas

- rural standards for streets
- plant trees

- stagger placement of housing
  - lots large enough to accommodate compound housing, corrals, and ceremonial hogans
  - underground utilities
  - solar orientation
  - local building materials.
- 2f. Work with funding agencies to renovate and repair existing housing.

**Policy 3.** Promote housing programs that can bring housing within the reach of all community members at all income levels.

- 3a. Types of available housing assistance: HUD's Office of Native American Programs (ONAP):
- Native American Housing Self-Determination Act (NAHASDA)
  - Title VI Indian Tribal Housing Activities Loan Guarantee Program provides loan guarantees for block grant recipients who need additional housing funds but are unable to borrow from other sources.
  - Indian Housing Block Grants - combines all Housing and Urban Development (HUD) funds for Native Americans into one needs-based block grant providing a wide range of housing services.
  - Section 184 Program - for Native Americans who want to buy, build or rehabilitate a home in an Indian Area and need mortgage financing.
  - Indian Community Development Block Grant (CDBG) - low/moderate income funding for housing rehabilitation, new construction, purchase of land, and community facilities.

Other funding sources include:

- U.S Department of Agriculture (USDA)

- Rural Housing Services (RHS)
- low interest, low down payment loans for new housing, housing rehabilitation, subsidized rental housing
- Bureau of Indian Affairs (BIA) Housing Improvement Program (HIP) - housing rehabilitation
- U.S. Department of Veteran Affairs - low interest, low down payment
- Fannie Mae - conventional loans, Native American loans
- Indian Health Service (IHS) - bathroom additions, plumbing
- Internal Revenue Service (IRS) - Low Income Housing Tax Credit (LIHTC) program -- subsidizes capital investment in newly constructed or rehabilitated rental housing. Can be used to leverage NAHASDA funds.
- Federal Home Loan Bank (FHLB) - Affordable Housing Program (AHP) provides subsidies or low interest loans to a housing developer; can leverage costs of construction, rehabilitation, and/or pay down payments, closing costs, etc.

**Policy 4.** Create opportunities for starting local businesses.

- 4a. Work with the Small Business Administration (SBA)/Regional Business Development Office (RBDO) to:
- provide a Chapter sub-office for routine visits by SBA/RBDO agent
  - technical support for obtaining clearances, withdrawals
  - provide entrepreneurial training
  - assist in preparation of business plans direct individuals to financing/business loan programs.
  - obtain funding for market feasibility

studies from the Nation's Economic Development Division.

- 4b. Work with the Economic Development Division to streamline the business site lease process. As described in the Overall Economic Development Program (OEDP), provide for:
- uniform site lease forms
  - delegation of lease approval authority to the Economic Development Department and eventually to Chapters
  - revisions to the Business Site Leasing Act
  - compensation to grazing permit holders (see policy 9).
- 4c. Identify methods for Chapters to start business ventures:
- master leasing (see policy 8)
  - revenue sharing with Chapters
  - partnering with nearby Chapters
  - establishing cooperatives to market goods, provide shared spaces to sell and store merchandise.
- 4d. Various small business programs are available including:
- Federal Omnibus Package of 1993
    - allows faster depreciation of machinery and equipment on reservations; 20% tax credit on wages and benefits to Indian employees
  - The BIA Loan Guaranty Program (Indian Financing Act of 1974) for lenders. Up to \$500,000 for businesses
  - New Mexico Office of Indian Affairs
  - Native American Initiative - provide technical assistance; offices located in border towns



- New Mexico provides training incentives and tax credits for manufacturing companies
- New Mexico Enterprise Zones programs -- tax credits
- Business and Industrial Development Fund (BIDF) -- Navajo Nation revolving loan fund provides low interest loans of \$10,000 to \$150,000
- Micro-Enterprise Lending Program (MELP) - Navajo Nation micro loan program
- Accion New Mexico and Westcorp (for Women) -- foundations provide micro loans.

**Policy 5.** Identify locations for business.

- 5a. Businesses should be located in nodes at highway intersections
- 5b. Shared facilities should be set aside for vendors to sell farm products, arts and crafts, and for other small businesses (incubators)
- 5c. Identify locations for businesses catering to tourism and travelers
- 5d. Identify locations for businesses providing basic goods and services
- 5e. Identify expired business leases to be re-issued to new leasees/tenants.

**Policy 6.** Identify locations and funding sources for community facilities.

- 6a. Land should be set aside for community uses such as parks, preschools, community centers, etc. in all subdivisions
- 6b. Co-locate/share community facilities within Chapters
- 6c. Small Chapters may choose to share facilities with nearby Chapters
- 6d. Provide technical assistance/grant writing training for Chapters

- 6e. Public and private funding sources for community facilities include:
- Indian CDBG
  - New Mexico Community Foundation
  - McCune Charitable Trust
  - Ford Foundation
  - Revenue Bonds -- now used by Kayenta Township, will become available to Chapters under the LGA. Debt is repaid with sales taxes or lease fees.

**Policy 7.** Land Use Plans should serve as a guide to decision makers when approving new development in the Chapter.

- 7a. Adopt a permit approval process (performance-based zoning rather than traditional zoning):.
- Permit application/development plan is submitted to Land Use Committee (or Chapter planner if position exists).
  - Land Use Committee reviews development plans / issues or denies permit.
  - Allow service provider agencies to review development plans.
  - Land Use Committee follows the land use plan and development guidelines in making the decision.
  - Land Use Committee may recommend to amend the land use plan, if appropriate.
  - Amendments to the land use plan require a public hearing (some more intensive uses, i.e., mining, industry, may also require a public hearing)
  - Chapter officials act as an appeals board.
  - If site is not withdrawn, all clearances must be given by appropriate authorities.
- 7b. Adopt development guidelines that take into account.

- land status/grazing status
- proposed improvements: structures, signage, lighting, landscaping, roads, utilities, etc.
- mixed uses are allowed
- compatibility with surrounding uses; mitigation of noise, light, visibility, if applicable
- suitability of site: topography, floodplain, soils, vegetation, wildlife, cultural sites
- housing guidelines (see policy 2e).

**Policy 8.** Work to withdraw Chapter tracts prior to the proposal of new projects.

- 8a. The Chapter should withdraw large enough tracts of land to meet the development needs of the community for next 20 years.
- 8a. Chapter tracts should identify land for a variety of uses: residential, commercial and community uses.
- 8c. Clearances, leases, etc. should be approved for the entire tract rather than piecemeal. The Chapter holds the master lease, which then may be sublet to businesses and individuals.

**Policy 9.** Preserve traditional farming and grazing land uses in the Chapter.

- 9a. Provide conflict resolution with grazing permittees for proposed development.
- 9b. Work with the Department of Agriculture to implement grazing fees as authorized by proposed Uniform Grazing Act.
- 9b. Work with the Navajo Nation to develop a grazing income compensation fund.
- 9c. Provide land exchanges when possible.
- 9d. Work with Natural Resources Conservation District and Navajo Nation Department of Agriculture to improve grazing management.

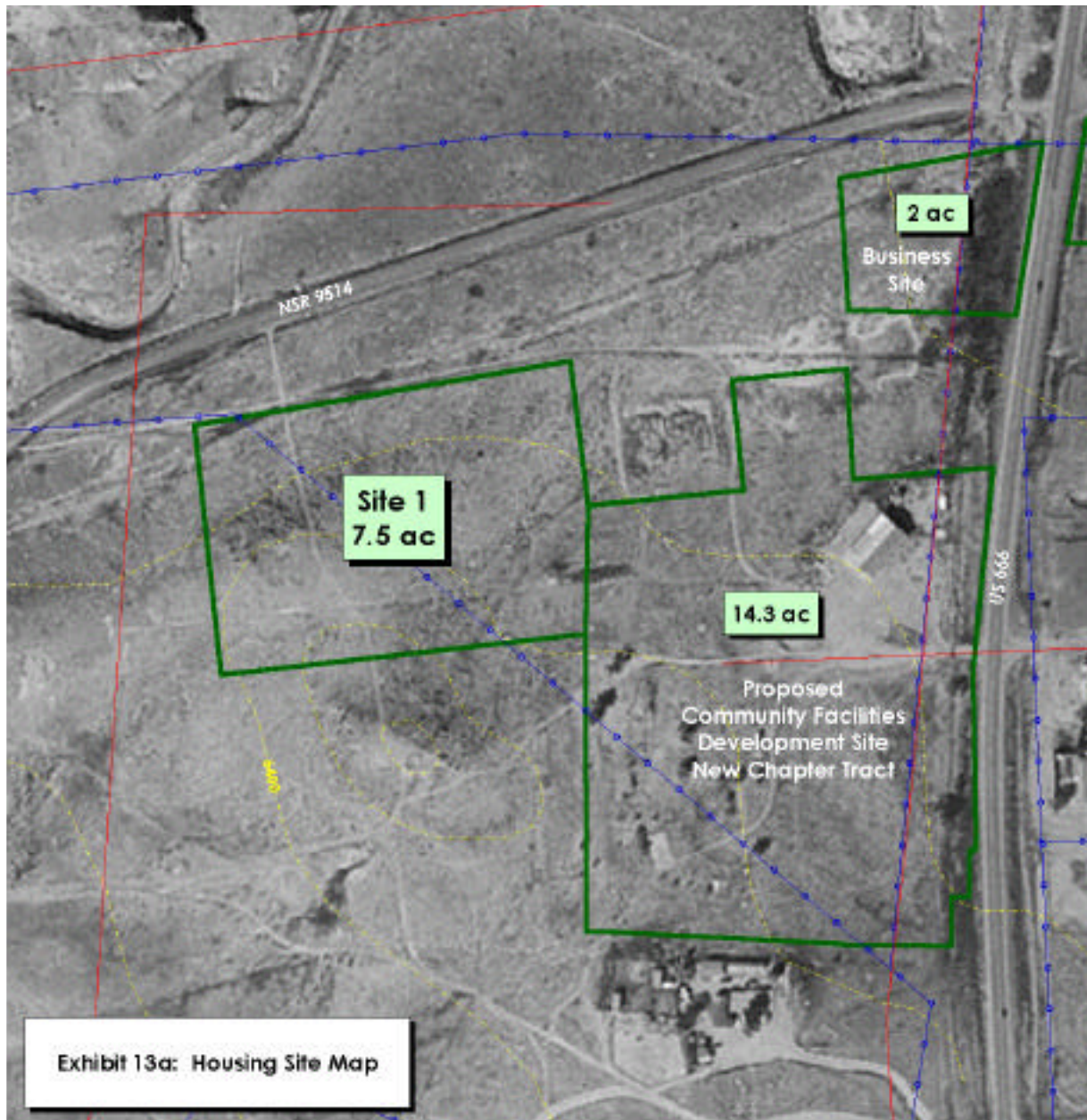
- 9e. Development should not be located near check dams.

**Policy 10.** Chapters will define their boundaries and consolidate lands.

- 10a. Meet with surrounding Chapters on boundary disputes.
- 10b. Survey boundaries and obtain legal descriptions
- 10c. Work with BIA, BLM, and state to bring checkerboard lands into trust status.

## Exhibit 12: Future Land Use Map

Exhibit 13a: Site 1 Map



Proposed  
Sites

Contour Lines

Electric Lines

Water Lines

## Twin Lakes Site 1

100 0 100 Feet



Architectural Research Consultants,  
Incorporated February 2001



NORTH



Site 2 (eliminated)



Exhibit 13c: Site 3 Map

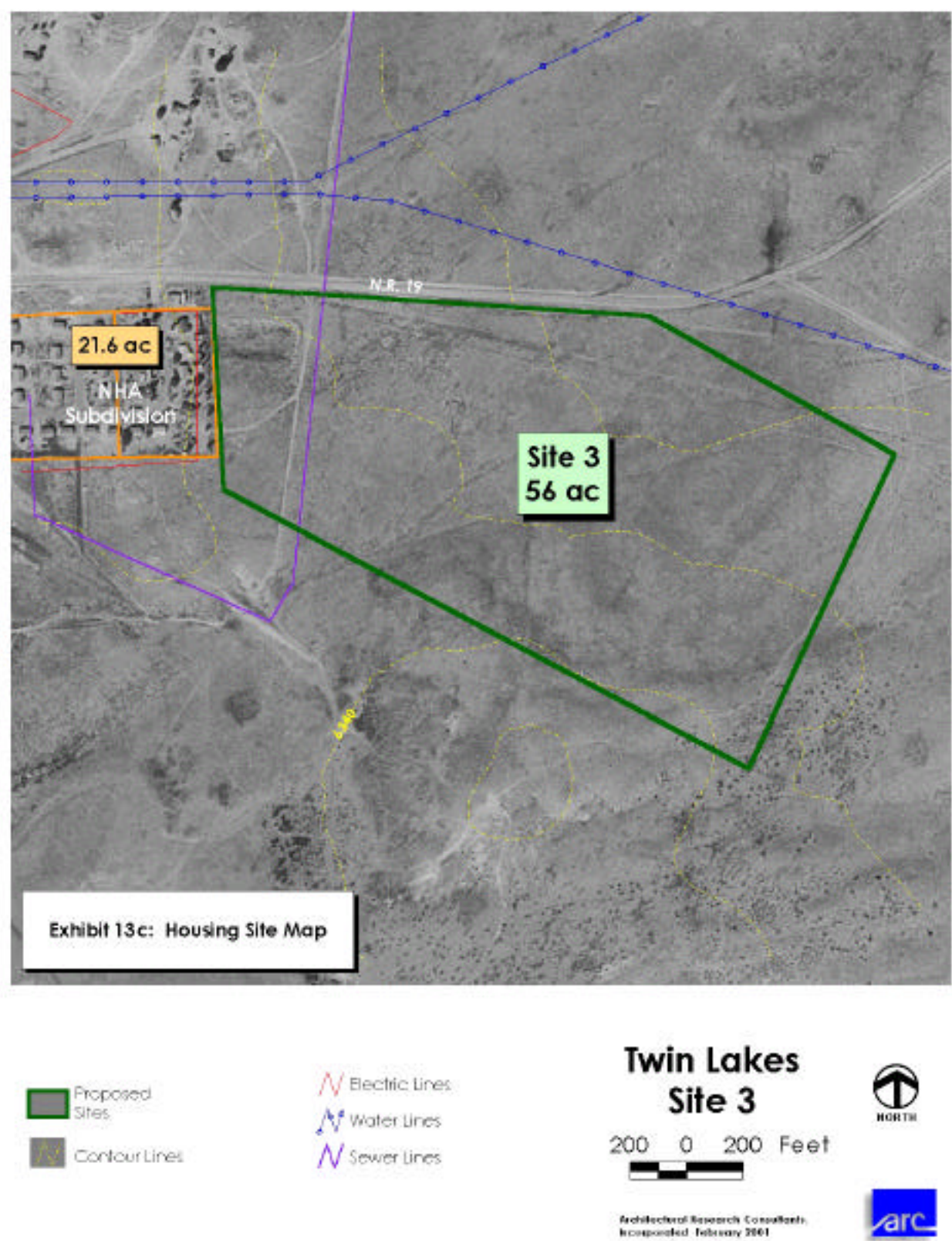




Exhibit 13d: Site 4 Map

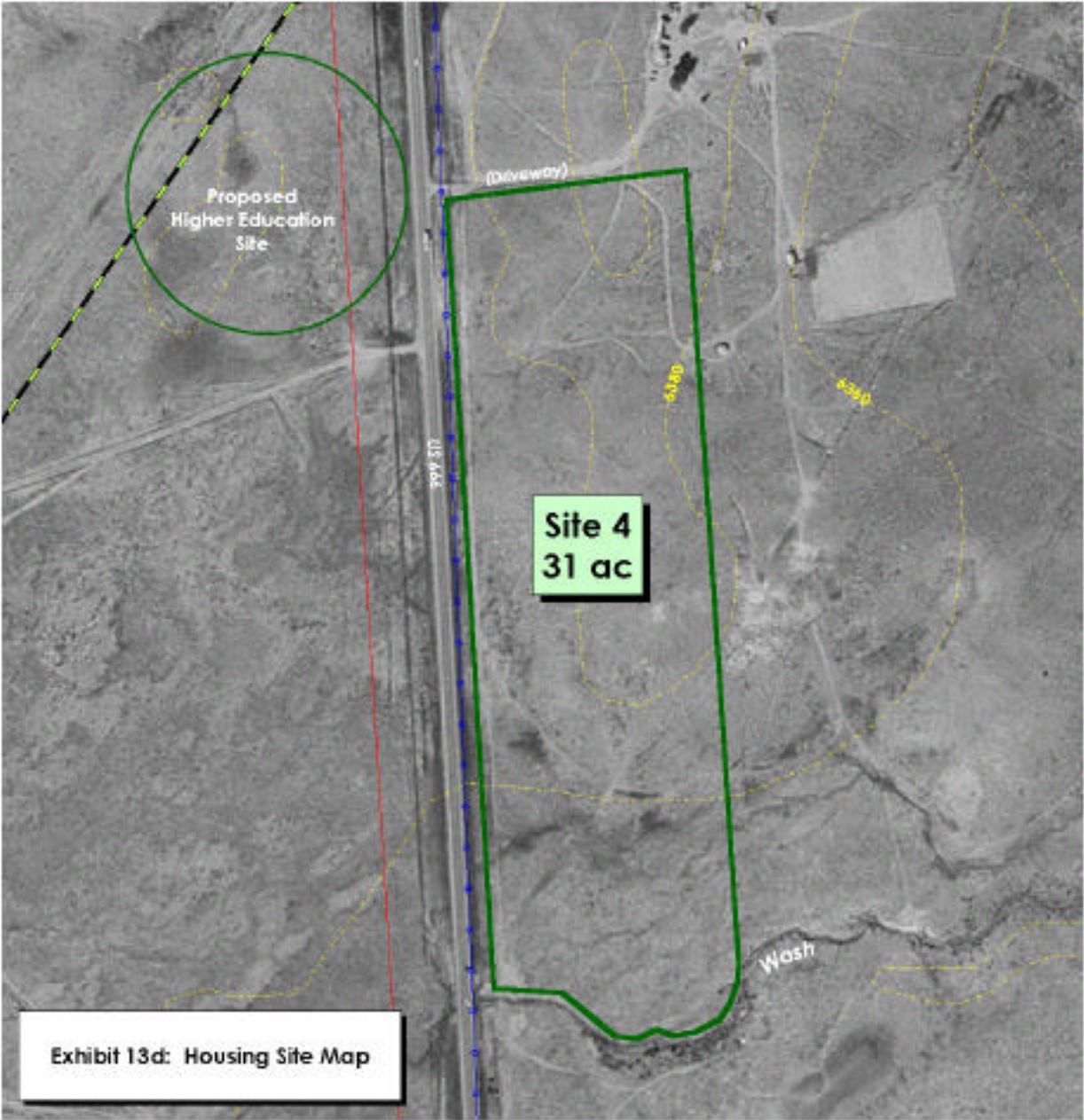
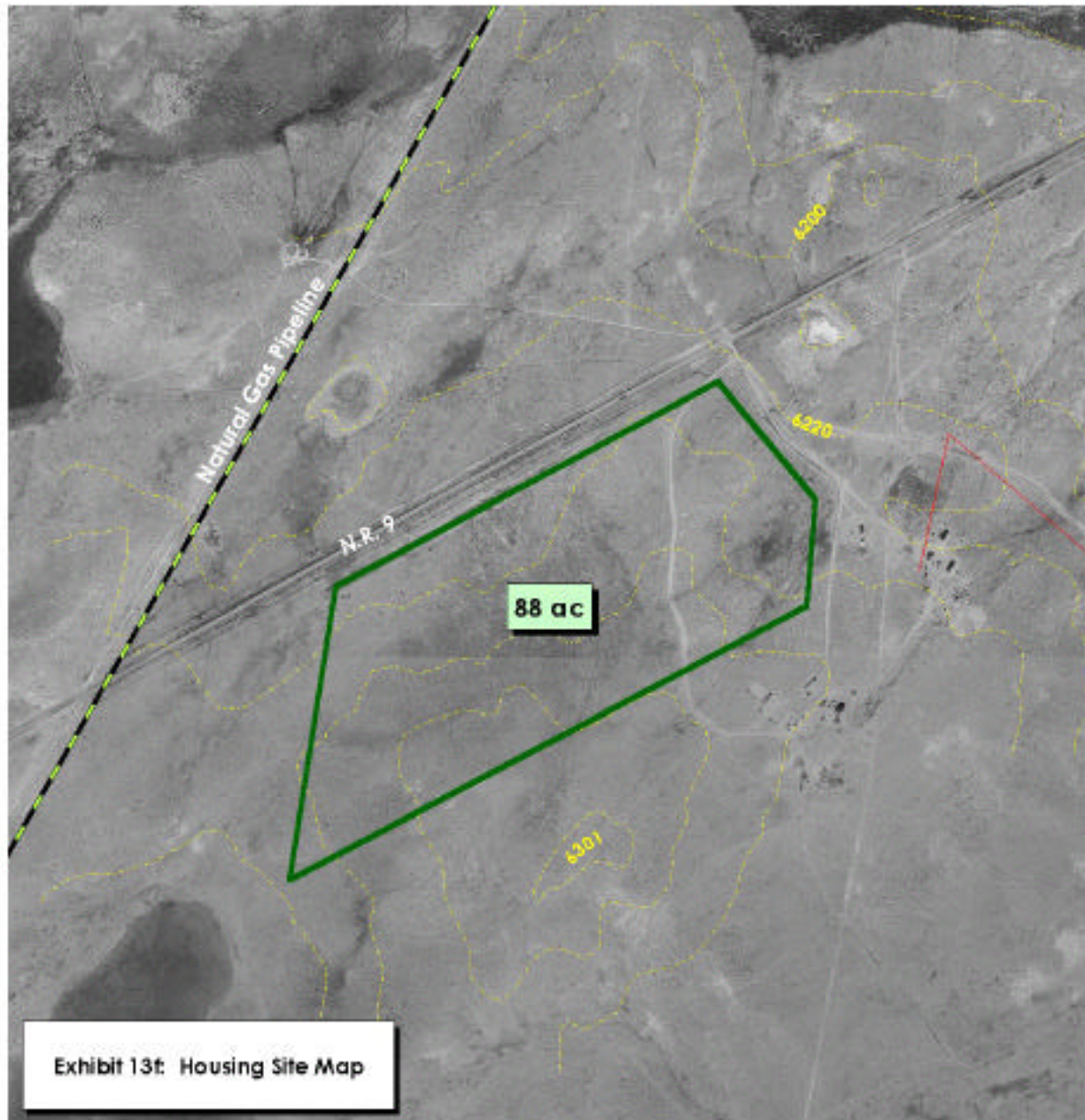


Exhibit 13e: Site 5 Map (eliminated)

Exhibit 13f: Site 6 Map



Proposed Sites

Contour Lines

Electric Lines

Gas Lines

**Twin Lakes  
Site 6**



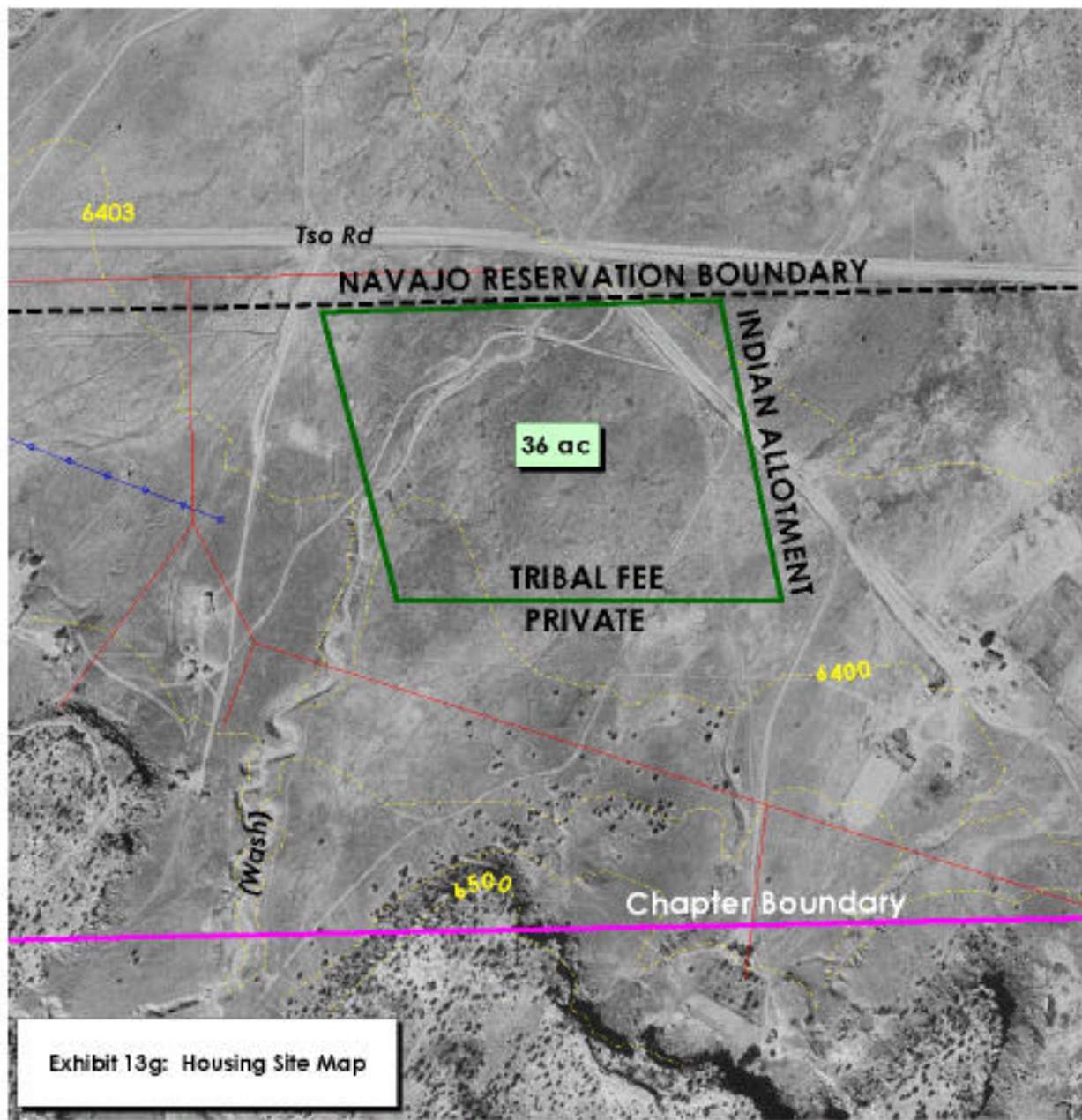
500 0 500 Feet

Architectural Research Consultants,  
Incorporated January 2001





Exhibit 13g: Site 7 Map



Appendices include the following:

- F1. Definitions, Acronyms, and Abbreviations
- F2. Soils Maps
- F3. Public Participation.

## F1. Definitions, Acronyms, and Abbreviations

### *Definitions*

**Clustered Housing:** Housing developed in subdivisions or in patterns that are grouped together.

**CLUP Committee:** Comprehensive Land Use Planning Committee - committee designated under the LGA to oversee the development of a land use plan.

**Community Facilities:** Schools, preschools, clinics, Chapter houses, police/fire stations, recreation and senior centers, etc.

**Economic Development:** Training programs and tax or other incentives designed to retain existing businesses as well as create and/or attract new businesses.

**Infrastructure:** Utilities (water, sewer, gas, electric, telephone, solid waste facilities), and roads.

**Land Status:** Type of land ownership as identified below:

**Allotment** - Land in legal title of the U.S. held in trust for an individual Indian. The BIA has power over this land and the tribe has no consent privilege. The land can be leased to non-Indians or sold to a tribe with the consent of an individual.

**State Land** - Lands in legal title of the State of New Mexico.

**U.S. Purchase Lands** - Lands purchased from 1915 to 1933 using tribal and government funds. Total purchase in New Mexico is 188,342 acres. These lands are held in trust by the Navajo tribe.

**Public Domain** - Lands owned by U.S. and administered by the BLM.

**P.L. 2198 Land** - BLM land slated to be exchanged with individuals to consolidate Tribal lands.

**Administrative Reserve** - Lands specifically set aside by executive order or statute to be used as administrative sites for agency or school purposes. Lands in legal title of the U.S. conveyed into trust status. These lands are specifically set aside for administrative uses.

**Private Land** - Lands with legal title owned by a person or legal entity. These lands belong to individuals or legal entities and are taxable. The owner, who can be Indian, has power over the land.

**Land Use Plan:** A document identifying existing and future land use. It serves as a guide for the orderly development of a community. It generally contains information about current conditions and needs, as well as goals, priorities, and vision for the future. Additionally, it identifies recommendations for implementing the plan. A land use plan is only one component of a **Comprehensive Plan** which may also include components on open space, community facilities, transportation, economic development, etc.

**LGA:** Navajo Nation Local Governance Act of 1998. Law passed by Navajo Nation that grants local authority over local issues related to:

- Economic development
- Taxation and Revenue Generation
- Bonds
- Infrastructure Development
- Land Use Planning/Zoning/Ordinances
- Federal, State and Tribal Contracts
- Public Safety/ Recreation

The LGA has two requirements:

- The adoption of the Five Management System - accounting, personnel, property, procurement, and record keeping policies and procedures.
- If a chapter wants to “administer land,” it must develop and adopt a comprehensive, community-based land use plan.

**NAHASDA:** Native American Housing Assistance and Self Determination Act of 1996

NAHASDA reorganized the system of federal housing assistance to Native Americans by:

- NAHASDA provides for tribal governing bodies to name a tribally designated housing entity (TDHE) to prepare an Indian Housing Plan (IHP)

**Participation Process:** Process adopted by the CLUP committee to ensure community participation and education during the preparation of the land use plan.

**Planning Process:** Steps involved in preparing a land use plan.

**Community Assessment** - assess community needs for housing, economic development and community facilities.

**Infrastructure Analysis** - compile data on transportation and utilities needed for development to occur.

**Suitability Analysis** - examine the natural and cultural resources and environmental constraints to development.

**Scattered Housing:** Housing developed in a spread out, distributed pattern.

**Service Area:** The planning area of a chapter encompassing all lands within it. Chapter members may live outside of this area and still be eligible for Chapter programs.

**Traditional Cultural Properties** - sites sacred to the chapter community.

**Withdrawn Land:** Sites for which all clearances and approvals have been given.



### ***Acronyms and Abbreviations***

ADT – Average Daily Traffic  
AHP – Affordable Housing Program  
BIA – Bureau of Indian Affairs  
BIDF – Business and Industrial Development Fund  
BLM – Bureau of Land Management  
CHR – Community Health Representative  
CIP – Capital Improvement Program  
CLUPC - Community Land Use Planning Committee  
CR – County Route  
CDBG – Community Development Block Grant  
EPA – U.S. or Navajo Environmental Protection Agency  
EPA – Eagle Protection Act  
ESA – Endangered Species Act  
FNLB – Federal Home Loan Bank  
GED – General Education Degree  
HIP – Housing Improvement Program  
HUD – U.S. Department of Housing and Urban Development  
I.H.S. – Indian Health Service  
IHP – Indian Housing Plan  
ISR – Indian Service Route  
JMEC – Jemez Mountain Electric Cooperative  
LGA – Local Governance Act  
LIHTC – Low Income Housing Tax Credit  
MELP – Micro Enterprise Lending Program  
MBTA – Migration, Bird Treaty Act  
NAHASDA – Native American Housing and Self Determination Act  
NCC – Navajo Communications Company  
NDOT – Navajo Department of Transportation  
NEPA – National Environmental Protection Act  
NESL – Navajo Endangered Species List  
NHA – Navajo Housing Authority  
NHS – Navajo Housing Services  
NRCS – Natural Resource Conservation Service  
NSR – Navajo Service Route  
NTUA – Navajo Tribal Utility Authority  
OEDP – Overall Economic Development Program  
OEH – Office of Environmental Health  
ONAP – Office of Native American Programs  
RBDO – Regional Business Development Office  
SBA – Small Business Administration  
TDHE – Tribal Designated Housing Entity  
USDA – US Department of Agriculture

## **F2. Soils Maps**

## Exhibit 14a: Soils Map

## Exhibit 14c: Soils Map

Exhibit 14d: Soils Map

## Exhibit 14g: Soils Map

### **F3. Public Participation**