Appendix D – Excerpts from Former Bennett Freeze Area Chapter Land Use Plans

1. Bodaway Gap Chapter

This Chapter includes the communities of Navajo Springs, Bitter Springs, Cedar Ridge, the Gap, Hidden Springs, and the Junction. It is bordered by Cameron Chapter to the south, Coalmine Canyon Chapter to the southeast, and Tuba City and Coppermine Chapters to the east.

The following communities within the Chapter were affected by the former Bennett Freeze: Cedar Ridge, the Gap, Hidden Springs, the Junction (U.S. Highway 89 and U.S. Highway 160), a section of the Little Colorado River Valley Gorge, and the residents along the Colorado River.

1.1 Bodaway Gap Chapter Physical Setting

Chapter terrain is composed of deep canyons, open desert, and towering red rock cliffs. Elevations in the Chapter vary between 3,000 feet at the Colorado River to 7,000 feet atop the Echo Cliffs. The Chapter is surrounded by several tourist attractions: Lake Powell, Grand Canyon National Park, and Wupatki-Sunset Crater National Monument. The area is characterized by high elevation desert scrub and juniper woodlands. Ephemeral washes cross the Chapter, the three largest being Tanner Wash, Moenkopi Wash, and Hamblin Wash.

1.2 Bodaway Gap Land Status

The Chapter is located within Navajo Nation Land Management District 3 and consists of six main communities, rangeland, and open space. The Chapter is comprised of trust land with no private holdings, although a portion of the San Juan Paiute Reservation is located within the Chapter boundary. The Chapter is experiencing land disputes within and at its border. According to the Navajo Nation Land Department, the Grand Canyon Enlargement Act identifies the eastern rim of the Grand Canyon as the easternmost border of the National park. This constitutes the western border of both the Navajo Nation and the Chapter. The Chapter boundaries overlap with the Cameron Chapter near the Little Colorado River. The process for addressing inter-chapter land overlap is handled by the Natural Resources Committee of the Navajo Nation, and appeals are heard in the Navajo Nation's District Court and Supreme Court.

1.3 Bodaway Gap Land Use

Approximately 95 percent of the Chapter's land is used for grazing cattle and sheep. Bodaway Gap is located within Grazing District 3 and Sub-Unit 3 and managed under Navajo Grazing Regulations (CFR 25, part 167) and by BIA Regional Director for the Shiprock, Fort Defiance, Chinle, and Tuba City Agencies and the Superintendent for the Crownpoint Agency. Ranger stations to patrol grazing land within the Chapter are located at a distance of at least 190 miles away, in Chinle and Shiprock.

The lack of ranger stations within the Chapter has resulted in insufficient range enforcement. There is also a lack of range preservation programs and public education in the FBFA of which this Chapter is within

84 percent. The lack of an adopted range management plan has resulted in deteriorating conditions. Overgrazing has caused increased soil erosion and inadequate vegetation for livestock. Most grazing areas are not clearly identified or fenced. This has resulted in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally and culturally sensitive areas such as steep slopes, riparian corridors, and Areas of Avoidance (AOA). AOA consist of traditionally and culturally sensitive areas set aside to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use. These are discussed further in the Bodaway Gap Chapter Cultural and Traditional Resources sections. Areas of development, actions (projects), and project phases for the Chapter were also identified in the same study. Planning process, projects, and project phases for this Chapter are expanded on in the Bodaway Gap Chapter Community Needs Assessment section.

1.4 Bodaway Gap Population and Housing

The 2010 US Census lists the Chapter population as 1,704 individuals. The Chapter has six communities where most tribal members reside. Other tribal members live in scattered homesites or clustered housing throughout the Chapter. The majority of homes are owner-occupied, but there are a considerable number of vacant homes. The Chapter's owner-occupancy rate is lower than the Navajo Nation's and Arizona's largely due to residents maintaining seasonal homes for recreational and livestock activities. The majority of homes (81%) in the Chapter are single detached homes.

Most of the residences are located along Highway 89, where water and electrical lines provide service. Residences located outside the main communities or away from Highway 89 are not served by utilities. According to field data conducted by WHPacific, Inc. (2008), 73% of homes in the Chapter are in poor to very poor condition, and 6 percent are in good to very good condition.

1.5 Bodaway Gap Government and Utility Infrastructure

The existing Chapter House is inadequate and needs renovation or reconstruction. The existing post office is too small for the current population. There is also a need for a veteran's center, an improved and expanded senior center, an animal shelter, and additional churches within the Chapter.

Empowering local governance within the Chapter was identified as a priority in the 2008 community workshops. The Chapter does not currently have the personnel or adequate facilities to support sufficient local government. An empowered local government will provide well-written proposals and can take on looming challenges positively. A dedicated committee can be created to follow through on needed projects and plans.

The Chapter desires to hire Chapter members to staff new Chapter government positions. In order to begin hiring for these positions, these chapters need to develop job descriptions for both a Community Services Coordinator and all other Chapter positions. Ongoing training in leadership, financial management, public financial management, public service, and project management will build community development and local governance at the Chapter level.

The availability of utilities is very limited throughout most of the Chapter. Water, sewer, and electricity are available along parts of Highway 89. In most cases, residents not located adjacent to the highway do not have basic utilities. The WHPacific 2008 field survey indicated that over 40 percent of the residential structures were without electric power.

Existing services are provided by a variety of programs: Navajo Tribal Utility Authority (NTUA) provides water and sewer service, and Frontier Communications, formerly Navajo Communications Company, provides limited telephone service. All Chapter members use aboveground propane tanks for their natural gas needs.

1.6 Bodaway Gap Environmental Safety Status

The after effects of previous mining activities have threatened the environmental quality of several areas within the Chapter. There are 24 abandoned uranium mines located throughout the southern portions of the Chapter. Water quality associated with these abandoned uranium mines have put the Chapter at considerable health risk due to detectible levels of heavy metals and radiation (WHP 2008b).

Heavy metals and radiation have been detected at five locations. Areas with higher than normal radiation are located at Highway 89 between the Junction and Hidden Springs (WHPacific 2008). Seven areas have been identified as posing a health risk to tribal members. Oh De Koinsh Spring and Tanner Wash windmill were identified as having "some risk" to human health due to heavy metals and radiation (WHP 2008b). Toh De Koinsh Spring is two miles north of Bitter Springs while Tanner Wash windmill is two miles south of the community of The Gap. The Chapter would like to be part of a regional strategic plan to remedy environmental health hazards. This study will include an inventory of uranium contamination sites throughout the Chapter and a plan to restore environmental harmony.

1.7 Bodaway Gap Water

1.7.1 Legislation

All water resources within the Navajo Nation are under the jurisdiction of the Navajo Nation Water Code. These are subject to the water management practices of the Navajo Nation, and legislation has been created by the Navajo Nation to protect the water resources. This includes the Navajo Nation Clean Water Act, Water Quality Standards, and the Discharge Elimination System. Additionally, the Navajo Water Code prohibits any development within a half-mile of a well or windmill (WHP 2008b).

1.7.2 Surface Water

Surface water sources within the Chapter consist of the Colorado River, Little Colorado River, Tanner Wash, Hamblin Wash, Moenkopi Wash, several reservoirs, ephemeral washes, and several springs located along Echo Cliffs.

1.7.3 Ground Water

The Bodaway Gap Chapter groundwater is derived from aquifers, and Chapter wells tap into the N-aquifer. The low population density requires only about three percent of the total groundwater to be withdrawn in Arizona from aquifers located in this province (WHP 2008b). However, Navajo Nation Water Resources states that groundwater storage greatly exceeds the annual demand but that only a small fraction of the total groundwater in storage capacity can be readily developed. Generally, this is due to the water quality varying within the aquifer structure. For example, the deeper portions of the groundwater basin have water that is too high in saline for use by humans or livestock (WHP 2008b). The Bodaway Gap Chapter water quality, due to the abandoned uranium mines, has shown detectible levels of heavy metals and radiation (WHP 2008b).

1.7.4 Wetlands and Floodplains

Historical surface water flow data is not available for most of FBFA, nor are flood plain maps. There are some recorded wetlands in the Chapter mainly in association with riverine areas and fresh water ponds (USFWS 2016). Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas surrounding Bitter Springs, Arizona, dated September 3, 2010, showed that there is a small area in which the base zone flooding has been determined for the 100-year flood and assigned Flood Zone AE (FEMA 2016). Flood Zone AE includes areas subject to inundation by the 1-percent-annual-chance flood event. The majority of the Chapter is assigned to Flood Zone X, areas determined to be outside 500-year floodplain.

1.7.5 Water Rights

Water rights from the Colorado River have been tied up in litigation for many years. Tribal members feel they should have access to the Colorado River, based on historical use.

1.7.6 Chapter Water Needs

The Chapter wants to develop a water conservation educational program and build a waterline that delivers water to the Chapter from above Echo Cliffs. The Soil and Water Conservation Service, the Chapter's Grazing Official, and the Water Development Office have initiated a community educational program to address these needs.

The lack of groundwater prohibits windmill development, and existing earthen stock tanks have dried up due to the drought. Tribal members have had to haul water for both personal use and livestock. Tribal members have adapted to the shortage of water by traveling to the Gap to collect water at a community well.

1.8 Bodaway Gap Agricultural Resources

1.8.1 Legislation

The Navajo Department of Agriculture (NNDA) is established under the Division of National Resources within the Executive Branch of the Navajo Nation. It is tasked as the lead agency in planning, coordination, and management of all programs, policies and regulatory provisions designed to protect and preserve Navajo rangelands, livestock and agricultural resources.

NNDA provides administrative, guidance and support services to District Grazing Committees, Farm Boards and Eastern Land Boards Members, with emphasis on regulatory oversight in accordance to the specified provisions of Title III of the Navajo Nation Code.

1.8.2 Community Farmers

Bodaway Gap residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Most of the agriculture that occurs within this Chapter, and the majority of the Navajo Nation, is defined by small family farms sized between 0.1–9.0 acres (US Census of Ag 2014). According to the US 2000 Census, 12 percent of Chapter residents are involved in agriculture or mining (WHP 2008b).

In order to perpetuate the type of farming traditional to the Navajo, Chapter members would like to cultivate small farms to produce food for Chapter members. This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community.

Bodaway Gap Soils

One of the most impressive soil features in the Chapter is the Painted Desert. It is located in the southern portion of the Chapter and is generally found west of Highway 89, east of the Grand Canyon, and south of Big Canyon.

The Natural Resource Conservation Service (NRCS) is in the process if conducting a soils inventory of the Chapter. Each soil unit identified has characteristics that can be used to determine the development potential of the Chapter. While several soil unit maps have been created as part of the inventory, they are incomplete and the data is subject to revision.

Land Suitability sites for development were identified in the CLUP 2008, and the Chapter should continue to consult with the NRCS as Chapter soil profiles are completed in regards to suitable development sites within the FBFA.

1.9 Bodaway Gap Biological Resources

1.9.1 Legislation

Vegetation and wildlife resources fall under protection of the Navajo Nation Department of Fish and Wildlife (NNDFW) within the Division of Natural Resources. The Resources Committee has oversight responsibility of the Department. The Resources Committee developed Biological Resources Land Clearance Policies and Procedures to follow prior to development to ensure compliance with federal and Navajo Nation laws protecting plant and animal species along with their habitat.

The Policies and Procedures include the maintenance of a database with maps that classify the lands of the Navajo Nation into six Wildlife Areas based on the number and type of sensitive biological resources known to be located in that area. Development restrictions apply within each Wildlife Area based on the sensitive resources in that area. Guidelines for each Wildlife Areas need biological assessments requirements prior to development have been set in place. Appendix Table G-1 presents the Wildlife Areas, their description, the development potential, and initial level of effort needed for project biological resource compliance fulfillment.

1.9.2 Threatened and Endangered Species

Several federal laws are designed to protect vegetation and wildlife resources within the Navajo Reservation. These laws include the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), the Eagle Protection Act, and the Migratory Bird Treaty Act (MBTA).

The federal government mandates the protection of endangered species found in the Colorado River and included in the Bodaway Gap Chapter. These species include the humpback chub, razorback sucker, Colorado pikeminnow (formerly known as the Colorado squawfish), and the bonytail chub. Projects governed under NEPA must have a biological survey conducted prior to project implementation with the exceptions of areas and projects listed in Appendix Table G-1.

1.9.3 Wildlife Areas

Bodaway Gap Wildlife Areas have been identified and preliminary biological resource appropriate-development plans have been suggested for several areas within the Chapter. The Chapter's western boundary is assigned a Wildlife Area 5 designation- biological preserve. There are several high sensitivity areas located throughout the Chapter, several low sensitivity areas, and no community development areas as yet identified by NNDFW. Figure 17 presents a map of the Bodaway Gap Chapter Wildlife Areas. This map is included in the Bodaway Gap Chapter Land Use Plan (WHP 2008b).

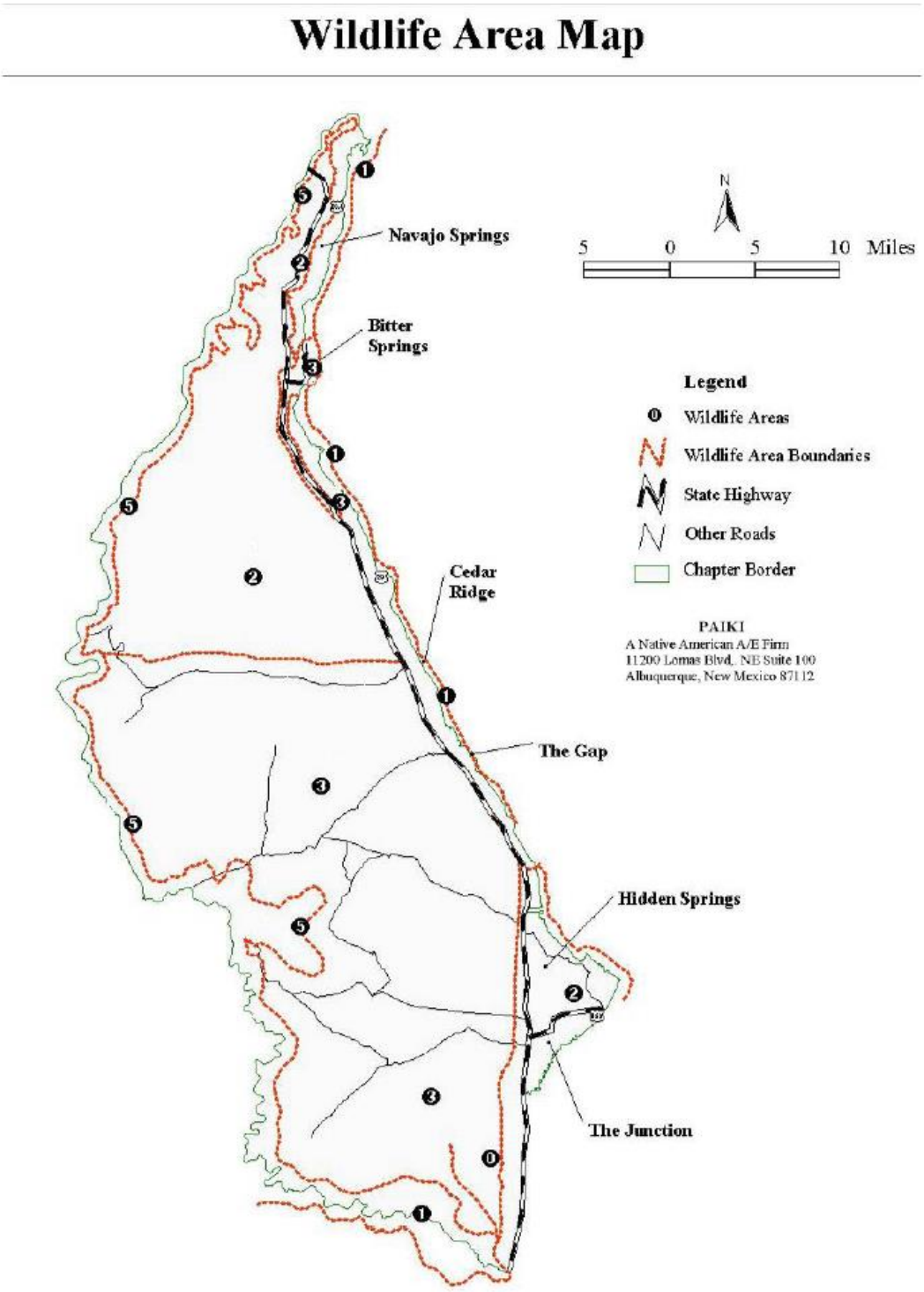

Figure 15: Wildlife Areas

Figure G-1. Wildlife Areas in Bodaway/Gap Chapter as published in WHP 2008b Bodaway/Gap Community Land Use Plan.

Appendix Table G-1. Wildlife Areas in Bodaway/Gap as published in the WHP 2008b Bodaway/Gap Community Land Use Plan

Wildlife Area Designation	Biological Resource Sensitivity Level	Development Potential	Biological Assessment Required
1	Highly Sensitive	Little to None	Yes
2	Moderately Sensitive	Possible with buffering and location restrictions.	Yes
3	Low Sensitivity	Possible small-scale, individual development (homesites and utilities).	Depends on Development Type: No for individual, small scale development. Yes for any other kind.
4	Community Development	Good	Required only if proposed development could have significant impacts outside the community or if a certain species is known to exist in the community.
5	Biological Preserve	Limited. Any development within Area 5 must be compatible with the purpose of the management plan for the Area, if available.	Yes
6	Recreational	Limited. These Areas are used for recreation and include fishing lakes, camping and picnicking areas, and hiking trails	Yes

1.10 Bodaway Gap Mineral Resources

1.10.1 Legislation

The Minerals Department, under the Division of Natural Resources, is the center for all minerals and exploration/development projects on the Navajo Nation. The Minerals Department is charged with ensuring the proper management and accountability of Navajo Nation mineral resources and the Department is also responsible for the reclamation of lands that are disturbed by mining activities.

1.10.2 Minerals

Uranium is known to exist within the Chapter as evidenced by the 24 abandoned mines. Coal has been mined in the past based on place names within the Chapter such as Coalmine Canyon. The Chapter has no

plans for mineral resource development and prefers to focus on mitigation and clean-up from past mineral extraction (WHP 2008b).

1.11 Bodaway Gap Cultural and Traditional Resources

1.11.1 Legislation

Navajo Nation Heritage and Historic Preservation Department is the lead agency for cultural resources preservation, protection and management planning on the Navajo Nation. It operates under the authority of the Navajo Nation Cultural Resources Protection Act [NN Code Title 19, §1001 (Chapter 8)].

The role of the NNHHPD is similar to that of a State Historic Preservation Office (SHPO). On behalf of the Navajo Nation, NNHHPD acts as the Tribal Historic Preservation Office (THPO) in the federal "Section 106" review process. NNHHPD advises federal, state/tribal agencies and project sponsors on protection and management of cultural resources in a manner that reflects the unique preservation concerns of the Navajo Nation.

1.11.2 Cultural Resources

The NNHHPD has inventoried and mapped the locations of several archeological sites and previous project locations, but the entire chapter has not been inventoried. NNHHPD does not reveal the locations of sensitive cultural sites due to the potential for vandalism, robbery, and the need to protect privacy. Hence the specific locations of cultural sites are not identified on maps.

Bodaway Gap Chapter has identified numerous sites where traditional cultural properties are found. In particular, the Colorado River, Marble Canyon, Echo Cliffs, Salt Canyon, Tanner Wash, and Shinumo Altar all have significant meaning to Navajo culture and traditions.

The Chapter has also identified AOA, as previously discussed in the Bodaway Gap Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance"–traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

1.12 Bodaway Gap Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (WHP 2008b).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

1.12.1 Bodaway Gap Vision

In the long-term, Chapter members want to maximize the benefits of modern opportunities, but at the same time maintain the integrity of traditional Navajo culture. Chapter residents want to preserve their rural atmosphere, but bring in modern amenities such as telephones, electricity, and plumbing to all residents who desire them.

1.12.2 Bodaway Gap Goals

During the community workshops held during summer 2008, community members outlined goals for the Chapter that will aid in reaching this vision. These goals include community policies, capital projects, and community service.

Community facilities and service are an important part of the community vision. The Chapter wishes to improve education, including expanding educational facilities for the Chapter's youth. A multi-purpose community center will provide a place for community members to congregate for recreational activities or community meetings. A community store will provide jobs and basic necessities for Chapter members and tourists. The Chapter wishes to hire staff to provide additional chapter services and provide ongoing planning efforts in an expanded office space with updated office equipment.

Infrastructure within the community will be improved, particularly within the FBFA, to provide water and electricity to all residents. Solid waste will be collected safely and reliably at a Chapter transfer station. Improved cellular communications infrastructure will improve quality of life and safety for all residents.

Because of the high cost of providing municipal infrastructure to remote houses in the Chapter, solar power with wind-powered back-up generators will be used to provide electricity to scattered rural homes. Rural homes will also have improved access to safe drinking water sources if the cost of connecting them to municipal services is too high. The Chapter will provide educational and training opportunities for residents and entrepreneurs to learn how to maintain these off-the-grid utilities.

Community facilities like a multipurpose center, schools, and an adult education center will provide computers and Internet access to support the curiosity, learning, and communication needs of all residents.

1.12.3 Bodaway Gap Resource Needs

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities

- Economic Development
- Education
- Open Space, AOA, and Grazing

1.13 Bodaway Gap Chapter Priority Capital Improvement Projects

These needs are fully outlined in the 2008 Bodaway Gap CLUP. Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top five projects the residents would like to see occur first consists of eight projects due to a three-way tie for the fifth project. The top projects include improved cellular phone and wireless service through the construction of communication towers, new scattered-housing sites that suit the traditional ranching lifestyle, construction of new skate parks for Hidden Springs, Bitter Springs, and Cedar Ridge, a sub-station for the Police Department in Gap, a 100-bed nursing home to serve Coppermine, Bitter Springs & Gap, young family housing, and a health clinic with a twenty-four hour ER/Trauma Department.

1.14 Proposed Infrastructure Projects

The Chapter would like to make sure that whenever additional infrastructure or infrastructure improvements are being considered, a feasibility study will be conducted. In addition to a feasibility study, the project should be included in the current year's Capital Improvements Plan for consideration. No infrastructure projects should be developed until they have been approved and are listed in a fiscal year within the Capital Improvements Plan. All infrastructure projects should be coordinated with Tribal and Federal infrastructure plans. Public Facilities should be based on approved facilities within the CLUP. Additional Public Facilities shall require an amendment to the CLUP.

1.15 Bodaway Gap Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in five years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years.

1.15.1 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents:

- Senior citizens center
- Major Chapter House renovation or new building

- Shopping Center at the intersection of Highways 89A and 89 that includes tire repair services, a gas station, and a pay phone
- Commercial Development - Junction 89/160 (100 acres): Truck Stop & shopping center including fast food, clothing store, groceries and services, bank, fast food - water & infrastructure, engineering, master plan
- Truck stop w/car wash, auto repair & parts (Jct. for Tuba City)
- Agricultural storage/warehouse storage (Cedar Ridge)
- Truck stop w/car wash (Bitter Springs)
- New grocery store and post office (Bitter Springs)
- Community livestock auction yard (Cedar Ridge)
- Feed store
- Earthen dams repair (West side ridge)
- Facility to sell wool
- Daycare (Gap)
- Health clinic - 24 hour ER/Trauma (in planning near school)
- Hospital with long-term care (in planning stage w/clinic)
- Wellness center - fitness equipment, instructors & swimming pool - ties in with special diabetes program
- Facility for CHR program combined w/special diabetes program service providers, adult home caregivers - i.e., Resource office for programs
- Dental office (in planning near school on top of hill)
- Scattered houses
- Young family housing
- Home improvement/renovations and additions
- Housing subdivision - 25 units (Hidden Spring)
- Elderly rehab for accessibility - bathrooms & ramps
- Special needs independent living housing
- Town houses
- 6" or 8" water pipeline (Colorado R. & Glen Canyon Dam to Gap – Bitter Springs, Hwy 160/Hwy 89)
- Wastewater lagoon - commercial development (Cedar Ridge - old trading post site)
- Cellular One or Alltel Cellular Phone Tower
- Waterline (Cedar Ridge)
- Waterline (Pillow Hill)
- Waterline (10 miles S.W. of Tooth Rock)
- Waterline (Tooth Rock)
- Water and power (Shimuno Mesa - aka Dzil Li chii)

- Phone Lines
- Waterline (Twin Hill)
- Power line (Pillow Hill)
- Wastewater lagoon (by new medical center)
- Internet - wireless
- Feasibility study for wastewater lagoon - houses and industrial development (Hidden Springs & Cedar Ridge)
- Power line (Twin Hill)
- Waterline (Sam Willie)
- Wastewater lagoons (Hidden Springs)
- Landfill (Jct. Tuba City)
- Expand existing waste transfer station
- New small waste transfer station (Bitter Springs)
- Veterans cemetery
- Cemetery
- Multi-purpose community center (Bitter Springs)
- Multi-purpose community center (Cedar Ridge)
- Police sub-station (Gap)
- Police & fire station (to serve all 5 communities)
- Home base for police and rangers
- Caution lights at the Trading Post
- Fire station (in ea. Community)
- Street addressing
- Crosswalk to store/Trading Post
- School bus turnout
- Signage - school bus safety
- E.R. safety turnoff for runaway trucks (Cedar Ridge)
- Center Median/Turn Lane (curve at Cedar Ridge)
- Fire hydrants
- Detention center (Gap) - nearest to Tuba City
- New road (Cedar Ridge to Red Mesa)
- Repair and pave road (Hidden Springs to Tuba City/Moenavi)
- ADOT maintenance yard for Winter snow removal (1/2 way to Page/Cedar Ridge)
- Grade existing roads
- Pave road (Red Mesa to Bitter Springs)
- Widen Hwy 89 to 4 lanes

- New road (IR 20 to US-89 straight S.)

1.15.2 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground:

- Veteran's center (Echo Cliff)
- Updated Laundromat (Gap)
- Small business and training center
- Ranch resort w/great view, horseback riding, summer jobs (W. side of Cedar Ridge overlooking Grand Canyon)
- New Community livestock corral (Gap)
- Rehabilitate Community Livestock Corral (Bodaway, Hidden Springs, Bitter Springs, and Cedar Hill)
- Daycare (Bitter Springs)
- Daycare (Cedar Ridge)
- Nursing Home - 100 beds (to serve Coppermine, Bitter Springs, and Gap)
- Repair and pave road (Hidden Springs to Tuba City/Moenavi)
- Pasture improvement
- Community hay farm
- Moveable fencing for pasturing
- Permanent fencing
- Feasibility Study - Vocational/Community Development Training Programs - G.E.D., welding, carpentry, pipe fitter, leadership, nursing, house repair, agriculture, construction management, project management, personal finance, entrepreneurship, customer service, land & livestock management
- Staff housing for nursing homes – individual homes - 100
- Waterline for livestock & agriculture (Cedar Ridge, Twin Hill, Pillow Hill, Tooth Rock, and Sam Willie)
- Water pump (South side of the Colorado River)
- Youth/adult recreation center - basketball, showers, lockers
- Park near a recreational center - playground, benches, shade, grill, softball, basketball, and grass (Bitter Springs)
- Ambulance service
- N20 road paved and improved to Lechee
- Pave BIA Road Loop (Hidden Springs Rt. 6231 past Twin Hill, Pillow Hill & Sam Willie)
- Truck stop w/car wash (Gap)
- R.V. Park (Gap)
- Power line or solar power (10 mi. S.W. of Tooth Rock)

- Nearby watering point
- Irrigation project for agriculture (over the hill)
- Recycling Center
- Rodeo center and trail rides (Hidden Springs)
- Campground & R.V. Park (Lee's Ferry)
- Campground & R.V. Park (Navajo Springs)
- Trail rides - horseback riding for tourists
- Football field w/track for walking, running (near a Wellness Center)
- Shuttles for service 3x week (Page, Tuba City, and Flagstaff)
- Safe bike trail (along Hwy 89)

1.15.3 Phase 3 Projects: 10-15 Years

- R.V. Park (Bitter Springs or Cedar Ridge)
- Animal shelter (Gap or Bitter Springs)
- Women's shelter (Gap)
- Destination resort (Navajo Springs)
- Motel (Marble Canyon and Navajo Springs)
- Tourist/Arts &Crafts Center (Cedar Ridge)
- Casino (Cameron Jct. 64 Flagstaff)
- Wal-Mart (Coppermine)
- Computers & technology lab - higher education distance learning/satellite courses
- High School (Bitter Springs)
- Trailer park
- Power line (Tooth Rock)
- Skate parks near E.R. facility (Hidden Springs, Bitter Springs, & Cedar Ridge)
- Community livestock health care center (Gap)
- Post office expansion or relocation (top of hill)
- Build bank for a dam/bridge (Cameron over Little Colo. & Destination Resort)
- Tourist/Arts & Crafts Center (Navajo Springs)
- Adult & Youth Educational Center - Continuing Ed., Daycare, Dist. Ed., Communications Lab, Vocational/Community College (Cedar Ridge)
- Solar Power
- Wind power – (residential)
- Picnic ground (Cedar Ridge)
- K-8 Elementary & Mid School (Bitter Springs)

1.16 Preferred Development Sites

The Chapter identified its six community areas as ideal locations for future development: Navajo Springs, Bitter Springs, Cedar Ridge, Gap, Hidden Springs, and the Junction.

2. Cameron Chapter

This Chapter includes the community of Cameron. It is bordered by Bodaway Gap Chapter to the north and the Coalmine Canyon Chapter to the east. The western border of Cameron Chapter is the western border of the Navajo Nation. One hundred percent of the Chapter's 236,338 acres is within the FBFA. The entire Chapter was affected by the Freeze.

2.1 Cameron Chapter Physical Setting

The topography includes the wooded slopes of the Grey Mountain and the deep gorge of the Little Colorado River (WHP 2008c). The Chapter is also home to eroded plains, valleys, buttes, dry washes, and mesas of the Painted Desert (WHP 2008c). Chapter elevation varies between less than 2,800 feet above sea level to over 7,200 feet above sea level (WHP 2008c).

The Chapter is less than 40 miles away from the Grand Canyon National Park, which received 4.4 million visitors in 2007 (WHP 2008c). Visitors have the option to take a 57-mile scenic drive from Cameron to the Grand Canyon Village along Highway 64, following the Little Colorado River Gorge, and passing through the Little Colorado River Tribal Park (WHP 2008c). Chapter vendors offer arts and crafts for sale at two scenic overlooks along this route. Highway 89 runs north from Flagstaff through the Cameron Chapter. This route is a heavily traveled route that brings significant tourist traffic through the Chapter (WHP 2008c).

2.2 Cameron Chapter Land Status

The Chapter is located within Navajo Nation Land Management District 3 and consists of one community, rangeland, and open space. The Chapter is comprised of trust land with no private holdings. The Cameron CLUP does not contain any information regarding land disputes within its border.

2.3 Cameron Chapter Land Use

The majority of the Chapter's land is used for grazing cattle and sheep. Cameron is located within Grazing District 3 and Sub-Unit 3. Ranger stations to patrol grazing land within the Chapter are located at a distance of at least 155 miles away, in Chinle and Shiprock.

The lack of ranger stations within the Chapter has resulted in insufficient range enforcement. There is also a lack of range preservation programs and public education in the Chapter. The lack of an adopted range management plan has resulted in deteriorating conditions. Overgrazing has caused increased soil erosion and inadequate vegetation for livestock. Most grazing areas are not clearly identified or fenced. This has resulted in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally and culturally sensitive areas such as steep slopes, riparian corridors, and AOA.

2.4 Cameron Chapter Population and Housing

The 2010 US Census lists the Chapter population as 1,122 individuals. The Chapter has one community where most tribal members reside, Cameron. There is one residential subdivision and the remainder of homes are scattered in more remote areas. The Navajo Housing Authority (NHA) has one subdivision of 25 housing units in Cameron. These homes are the only ones connected to a community sewer system (WHP 2008c).

The remaining houses are scattered homes built prior to 1970. The majority of homes are owner-occupied, but there are a considerable number of vacant homes. The Chapter's owner-occupancy rate is lower than the Navajo Nation's and Arizona's largely due to residents maintaining seasonal homes for recreational and livestock activities. The majority of homes (61 percent) in the Chapter are single detached homes (WHP 2008c). There is a higher than average number of mobile homes (27 percent) within the Chapter when compared to both Navajo Nation and Arizona (WHP 2008c).

Most of the residences are located along Highways 64 and 89 or near the junction of these highways, where water and electrical lines provide service. Residences located outside the Cameron community or away from Highway 89 are not served by utilities.

Many of the homes in the Chapter are of poor construction quality (WHP 2008c), and most of the homes within in the Chapter have been affected by the restrictions on improvements placed on the FBFA. This is based on the Chapter being located entirely within the FBFA.

2.5 Cameron Chapter Government and Utility Infrastructure

Empowering local governance within the Chapter was identified as a priority in the 2008 community workshops. The Chapter does not currently have the personnel or adequate facilities to support sufficient local government. An empowered local government will provide well-written proposals and can take on looming challenges positively. A dedicated committee can be created to follow through on needed projects and plans.

The Chapter desires to hire Chapter members to staff new Chapter government positions. In order to begin hiring for these positions, these chapters need to develop job descriptions for both a Community Services Coordinator and all other Chapter positions. Ongoing training in leadership, financial management, public financial management, public service, and project management will build community development and local governance at the Chapter level.

The availability of utilities is very limited throughout most of the Chapter. Water, sewer, and electricity are available along parts of Highway 89. In most cases, residents not located adjacent to the highway do not have basic utilities. The WHPacific 2008 field survey indicated that over 40 percent of the residential structures were without electric power.

Existing electric service is provided by Arizona Public Service (APS) and is crossed by two major electric transmission lines. The power lines are located approximately a mile from the U.S. Highway 89 and State Highway 64 corridors. The power lines distribute power from the electric grid in the Flagstaff and

Holbrook area and are not connected to the major lines that meet at the Moenkopi switchyard. The major grid that traverses the Chapter, without a direct connection to the Chapter, includes two 500-kilovolt (kV) electric power lines supplying power from the Navajo coal-fired generating station southbound to the Phoenix and southern California areas (WHP 2008c, pg. 2-48).

The APS electric distribution line that serves local needs carries power north from the Flagstaff and Holbrook areas to the Chapter. The Chapter currently has both three-phase power and single-phase power available along the U.S. Highway 89 and AZ Highway 64 corridors. All of the major power lines come together at the Moenkopi Switchyard, just northwest of the elementary school. The switchyard serves as an interconnection point where electric power may be switched, or redirected, to balance demands on the electric grid. Businesses require a higher voltage current connection, which is supplied by three-phase lines (the phases are known as A, B, and C phases, each with its own cycle and time). The main local power lines in the Chapter carry 69 kV and 12.5 kV current. Residents need a 120v and 240v electric current connection, which is supplied by single-phase power. At the Chapter's local electric substation, transformers reduce the incoming electric power and send it through local transmission lines as single- or three-phase power. The local APS electric power system will continue to expand its customer base. To do so, APS will work with Navajo Nation agencies to acquire the rights-of-way, land leases, and needed equipment. The Navajo Nation will work with APS to ensure future connections to the Chapter (WHP 2008c, pg. 2-48).

Natural gas is not available to the Chapter, and the majority of the Chapter residents use wood and coal for heating. Bottled propane is also available; however, it is imported from Flagstaff and Tuba City (WHP 2008c, pg. 2-51).

The Navajo Communications Company serves the telecommunication needs of the Navajo Nation. It provides landline telephone service, leases tower spaces to cellular companies, and offers cable television service. Cellular One and Verizon offer the best coverage for private cellular services on the Navajo Nation, although reception is often reported as unreliable and spotty (WHP 2008c, pg. 2-51).

Qwest Communications provides payphones at Cameron Trading Post. Improvements to the capacity of the landline system are planned along the major highways. Wireless communications require an initial investment in telecommunications towers by the wireless industry. Chapter members prefer wireless communication because the initial fees are less in comparison to landline service, which might require a line extension over a long distance (WHP 2008c, pg. 2-51).

2.6 Cameron Chapter Environmental Safety Status

Uranium ore was first discovered in the area at Ward Terrace in 1950. This led to construction of open pits along the Little Colorado River. Uranium was mined from these areas up to 1960. The uranium mines were abandoned and were reclaimed in 2000 (WHP 2008c, pg. 2-42).

2.7 Cameron Chapter Water

2.7.1 Surface Water

Chapter surface water is used for agriculture and livestock. When it rains, streams and washes are filled with water, which in turn fills watering holes. During times of drought, livestock has access to well water, either directly from the well or hauled to watering places.

The Chapter lies within the Little Colorado River Basin, which is part of the larger Colorado River water system. The Little Colorado River rises in eastern Arizona and in southeastern Apache County and flows northwest through a series of deep gorges directly underneath the Chapter's planning area. It joins the Colorado River in the Grand Canyon, approximately 70 miles north of Flagstaff. Moenkopi Wash, a smaller but significant tributary, covers the northeastern part of the Chapter and drains the northwestern escarpment of Black Mesa. Flow from this wash drains to the Little Colorado River. Numerous springs (mostly dry) dot the planning area (WHP 2008c, pg. 2-34).

There are at least 12 concentrated in the southern portion of the planning area. Other smaller tributaries of the Little Colorado River also drain the area: however, the water is lost by evaporation or infiltration before the flow reaches the Little Colorado River. Many of these tributaries are unnamed (WHP 2008c, pg. 2-34).

2.7.2 Ground Water

The Chapter is located along the edges of the Little Colorado River Basin where water-bearing rocks consist primarily of sandstone, limestone, and other conglomerates. Monoclines cross the area and provide structural control for the movement of groundwater along the regional gradient. The major water-bearing units are divided into two aquifers: the Coconino aquifer (C-aquifer) underlying the Little Colorado River Basin and the Limestone aquifer underneath the Coconino Plateau Basin (WHP 2008c, pg. 2-41).

2.7.3 The Coconino Sandstone

The C-aquifer system yields water of good chemical quality except southwest of Leupp and in the northern part of the Black Mesa basin where excessive amounts of dissolved solids could render it unfit for use. The C-aquifer includes the Coconino Sandstone, the De Chelly Sandstone, the Moenkopi Formation, and the Shinarump Member of the Chinle Formation. The Coconino Sandstone is of very fine to medium-grained, well-sorted quartz grains. The grains are coarse near the southern extend of the unit along the Mogollon Rim and grade into a finer grain size to the north. The De Chelly Sandstone is a thick-bedded fine- to medium-grained sandstone and hydraulically connected with the Coconino and the Shinarump Member of the Chinle Formation. The Chinle and Moenkopi Formations consist primarily of mudstone and siltstone beds. The Chinle Formation and the De Chelly and Coconino Sandstones are the primary sources of groundwater. The other members of Chinle Formation and the Moenkopi Formations are too fine-grained and act as aquicludes. The C-aquifer system thins rapidly to the north and pinches out along the Utah-Arizona border (WHP 2008c, pg. 2-41).

2.7.4 The Limestone Aquifer

The Limestone aquifer consists of several hydraulically connected limestone, dolomite, sandstone, and shale units. Most of the water in the aquifer is derived from the downward migration of water from the overlying C-aquifer system. Shale units within the Limestone aquifer impede the downward migration of water, while solution cavities and fracture zones provide avenues for lateral movement. A large portion of the groundwater moves northward and discharges from springs along the Little Colorado and Colorado Rivers and Havasu Creek. The largest of these springs includes Blue Springs and Havasu Springs, which discharge 100,000 and 29,000 gallons per minute, respectively. Groundwater development in the basin is small and limited by the great depth to water of 3,000 feet and the low yield of only a few tens of gallons per minute (WHP 2008c, pg. 2-41).

2.7.5 Wetlands and Floodplains

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. There are some recorded wetlands in the Chapter mainly in association with riverine and freshwater forested shrub areas along the Little Colorado River and fresh water ponds located south of the community of Cameron (USFWS 2016). Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas surrounding Cameron, Arizona, dated September 3, 2010, showed no flood prone areas (FEMA 2016).

2.7.6 Water Rights

Water rights from the Colorado River have been tied up in litigation for many years. Chapter residents feel they should have access to the Colorado River, based on historical use. The Chapter needs to look into acquiring water rights to the Colorado River and Little Colorado River in order to provide water to the community (WHP 2008c, pg. 3-6).

2.7.7 Chapter Water Needs

Improved water tanks at windmills are needed to better serve the water hauling stations. If water in these tanks will be used for human consumption, then water quality should be regularly monitored. Water storage tanks are needed for each house that is not connected to piped water (WHP 2008c, pg. 3-6). Drinking water is also needed within the Chapter, and new water well tapping into one of the aquifers is needed and included on one of the Chapter priority projects (WHP 2008c, pg. 3-11).Cameron Agricultural Resources

2.7.8 Community Farmers

Cameron residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Most of the agriculture that occurs within this Chapter, and the majority of the Navajo Nation, is defined by small family farms sized between 0.1–9.0 acres (US Census of Ag.

2014). According to the US 2000 Census, 10 percent of Chapter residents are involved in agriculture or mining (WHP 2008c).

In order to perpetuate the type of farming traditional to the Navajo, Chapter members would like to cultivate small farms to produce food for Chapter members. This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community (WHP 2008c, pg. 3-10).

2.8 Cameron Soils

The Natural Resource Conservation Service (NRCS) has completed a soil inventory of the Chapter. There are twelve soil units throughout the Chapter, and they range from fine sand, sandy loam, and gravelly clay loam to cinders and bedrock (WHP 2008c, pg. 2-37).

Land Suitability sites for development were identified in the CLUP 2008, and the Chapter should continue to consider soil profiles in regards to suitable development sites within the FBFA.

2.9 Cameron Biological Resources

2.9.1 Threatened and Endangered Species and Resource Protection Zones

Portions of the Chapter contain some sections classified by the NNDFW as Resource Protection Zone 1, a highly sensitive wildlife resource area. The Little Colorado River is protected with a buffer zone from thick riparian vegetation that protects yellow-billed cuckoo and southwestern willow flycatcher. The eastern portion of the planning along Ward Terrace is designated as Resource Protection Zone 2. The remaining area within the Chapter is designated as Resource Protection Zone 3, which is considered a low-sensitivity area (WHP 2008c, pg. 2-39).

2.10 Cameron Mineral Resources

2.10.1 Minerals

Uranium is known to exist within the Chapter as evidenced by the abandoned mines that were reclaimed in 2000 (WHP 2008c, pg. 2-42). The Chapter has no plans for mineral resource development in the CLUP. However, the Chapter feels natural resources such as mineral deposits should also be used wisely to ensure sustainability (WHP 2008c, pg. 3-5).

2.11 Cameron Cultural and Traditional Resources

2.11.1 Cultural Resources

The NNHHPD has inventoried and mapped the locations of several archaeological sites and previous locations, but the entire chapter has not been inventoried. The NNHHPD does not reveal the locations of sensitive cultural sites due to the potential for vandalism, robbery, and the need to protect privacy. Hence the specific locations of cultural sites are not identified on maps.

Cameron Chapter has identified numerous sites where traditional cultural properties are found and all of them have significant meaning to Navajo culture and traditions. Any cultural sites within the Chapter should also be preserved (WHP 2008c, pg. 3-5).

The Chapter has also identified AOA, as previously discussed in the Cameron Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

2.12 Cameron Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (WHP 2008c).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

2.12.1 Cameron Vision

In the long-term, Chapter members want to maximize the benefits of modern opportunities, but at the same time maintain the integrity of traditional Navajo culture. Chapter residents want to preserve their rural atmosphere, but bring in modern amenities such as telephones, electricity, and plumbing to all residents who desire them.

The Cameron Chapter would like to achieve this vision in the following way (WHP 2008c, pg. 3-1):

The Chapter should develop new and better housing and utilities, which will aid the establishment of economic development in designated corridors. The economic development will be implemented by working with economic development officials, utility providers, and others to further develop the selected sites for each land use improvement. Road and utility improvements should take place throughout the Chapter, particularly by providing electric and water service to additional customers. Certain more remote roads should be paved or otherwise improved.

In addition, programs will be developed to bring commercial and industrial businesses to the community and to provide community facilities. Within several years, the new economic development will bring jobs that will be available to local residents. The economic development and community facilities areas will be designed and built in a manner that is compatible with the preservation of residential, range, agricultural, and open space areas.

2.13 Cameron Chapter Goals

2.13.1 Guiding Principles

With the development goals, in mind the Chapter has developed guiding principles that would apply to each development project (WHP 2008c, pg. 3-5). The Chapter would like to provide for people's basic needs, such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service needs improvement to better respond to emergency situations (WHP 2008c, pg. 3-5).

Sustainable construction should be required for all new buildings. These buildings should be energy-efficient and designed to last many generations. Structures should be designed to work with the land in order to provide passive solar energy to further reduce energy costs, achieving the goal of Chapter self-sufficiency (WHP 2008c, pg. 3-5). These structures should provide optimal protection from the elements with high-quality insulation to better regulate indoor temperatures and raised floors to protect against flooding.

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community.

During the community workshops held during summer 2008, community members outlined goals for the Chapter that will aid in reaching this vision. These goals include community policies, capital projects, and community service (WHP 2008c, pg. 3-1).

Ranching and raising grazing animals is a rich and viable way of life in this Chapter. A nearby ranger station will help to more efficiently manage rangelands and prevent theft of livestock. Range management education programs will help preserve the quality of the land and maintain this means of subsistence (WHP 2008c, pg. 3-2).

All residents who wish to live in the Chapter will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members will be able to live in scattered homesites if they are grazers who prefer to live a subsistence lifestyle, or clustered housing developments if they prefer the amenities and infrastructure of a modern community (WHP 2008c, pg. 3-2).

Mobile home parks and rental houses will be available for people who may need to move from the Chapter in the future or for people who are in immediate need of a home. Elderly living facilities will allow independence while also providing assistance with preparing food, social opportunities, and medical care (WHP 2008c, pg. 3-2).

The road system will be improved and maintained to be safe and efficient in all weather conditions and seasons. Infrastructure within the community will be improved, to provide water and electricity to all residents. Solid waste will be collected safely and reliably at a Chapter transfer station (WHP 2008c, pg. 3-2).

Improved cellular communications infrastructure will improve quality of life and safety for all residents. Nearby emergency health, fire, and police facilities and substations will provide a quick response to medical and safety emergencies. Helicopter service to Tuba City or Flagstaff will respond to major emergencies. All homes will be assigned addresses for emergency response and be within range of reliable cell phone service (WHP 2008c, pg. 3-2).

Community facilities and services are an important part of the community vision. The Chapter wishes to improve education, including educational facilities for the Chapter's youth. A multi-purpose community center will provide a place for community members to congregate for recreational activities or community meetings. A community store will provide jobs and basic necessities for Chapter members and tourists. The Chapter wishes to hire staff to provide additional Chapter services and provide ongoing planning efforts in an expanded office space with updated office equipment (WHP 2008c, pg. 3-2).

Economic development will improve quality of life for the Chapter and retail and recreational opportunities for tourists. Ranchers will have nearby water resources for livestock. Chapter vendors will be able to sell Navajo arts and jewelry to tourists. Renewable energy projects, including solar and wind projects, will create green-collar jobs. The Chapter will be able to provide all of its energy needs and export surplus energy for a profit. Investment in the service industry to cater to tourists will further diversify the local economy (WHP 2008c, pg. 3-2).

2.14 Cameron Chapter Obstacles

The Cameron Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them. Some of the obstacles include lack of available land for development. There is not much land available for community development facilities or new homes due to the large number of grazing permits in the Chapter. The land withdrawal process to remove some of the grazing land to be used for development is a lengthy process that many grazing permit holders may not support. This is due to lack of adequate compensation for the grazing land withdrawal and the absence of feasibility studies for economic development projects that could allow land to be withdrawn for projects that are not justifiable (WHP 2008c, pg. 3-3).

In order to surpass this development obstacle, the Chapter can identify lands suitable for future growth and develop a memorandum of understanding with land users about the future use of these lands. This would require that the Chapter bring governance to the local level by initiating and pursuing Local Governance Act (LGA) certification. The land withdrawal and approval process is a long, bureaucratic

process. The Chapter could bring this process to a local chapter level and conduct its own business site lease agreements in order to speed up economic development projects and amend bylaws to promote Chapter flexibility. Under LGA certification, the Chapter can also promote equitable land use appraisal for compensation purposes for land withdrawn for development (WHP 2008c, pg. 3-4).

The Chapter feels the Navajo Nation central government is distant and inaccessible to the residents. The lack of a local government creates a feeling of powerlessness among community members. Resources from central government to build community and Chapter facilities is inaccessible, and conflicts between Navajo Nation chapters over chapter service areas and boundaries further restricts access to needed funding (WHP 2008c, pg. 3-4). This was identified as another obstacle to FBFA development.

Empowering local Chapter governance was identified as a solution to stagnant Chapter development. The Chapter needs to hire personnel to support local government. The Chapter desires to hire Chapter members to staff new Chapter government positions. In order to begin hiring for these positions, the Chapter needs to develop job descriptions for the Community Services Coordinator and all other Chapter positions. Ongoing training in leadership, financial management, public financial management, public service, and project management will build community development and local governance at the Chapter level (WHP 2008c, pg. 3-4).

Funding is another obstacle the Chapter recognized as in FBFA development. With limited federal money and lengthy bureaucratic processes to acquire it, the Chapter needs to seek money elsewhere to fund improvement projects. A grant writer on the Chapter payroll can help the Chapter receive better funding. Implementation of Native American Housing and Self Determination Act (NAHASDA) plans will help the Chapter gain funding from the U.S. Department of Housing and Urban Development (HUD). Generating local revenue through community-based projects will further help the Chapter gain more funding for projects (WHP 2008c, pg. 3-4). Based on the Chapter's proximity to an international tourist destination, a significant amount of generated local revenue could come from outside the Chapter.

2.15 Cameron Chapter Resource Needs

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

2.16 Proposed Capital Improvement Projects

The Chapter needs to create economic development projects, and continual updates to the Chapter development plans are necessary to help Cameron residents decide which projects will be the most beneficial to the residents. The Chapter's CLUP should continue to be regularly updated with a Capital Improvements list that can be updated as projects are completed and new projects are envisioned (WHP 2008c, pg. 3-5).

2.16.1 Cameron Chapter Priority Capital Improvement Projects

These needs are fully outlined in the 2008 Cameron CLUP (WHP 2008c). Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top five projects the residents would like to see occur first consists of nine projects due to several tied votes. The top projects include new scattered housing for Cameron Chapter residents, a new drinking well tapped into the aquifer, a water line extension in Ward Terrace and Black Falls, paving and improvement to existing roads, construction of a clinic/health center with dental, rehabilitation, cancer, pediatric and elder care, a power line extension for 15 homes in Gray Mountain and 47 homes in North Cameron Chapter, a new Chapter complex/one-stop shop multipurpose building with chapter offices, senior citizen center, business office, and office sites for lease, the construction of the Western Navajo water pipeline from Lake Powell to Cameron, and Public Service Complex with a police and fire station along with a jail (WHP 2008c, pg. 3-11).

The following ideas were added to the list of priority projects by the planning team and were not included in the previous list created during the community workshops (WHP 2008c, pg. 3-12).

- Fund water rights to Colorado River
- Command center for Emergency Response Team, drill teams, welcome committee
- Telephone landlines to all homes
- Veteran housing

2.17 Cameron Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008c, pg. 3-12).

2.17.1 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008c, pg. 3-12):

- Water filtration system

- Daycare
- Recycling Center/Compressor
- Solid Waste System/pickup
- Youth Sports Complex/youth recreation park/ball fields
- Coconino/Diné College Extension Facility
- Propane Station
- Road Maintenance Facilities
- New Vendor Booths
- Wind Farm Development
- Animal Feed Store
- Funding to acquire water rights to Colorado River
- Replace windmills and earthen tanks
- Identify range areas and farms
- Health Clinic
- Veteran Center
- New Scattered Housing for FBFA Residents
- Passive-solar energy-efficient homes
- Remote satellite education
- Improve by paving existing roads/school bus route
- Bridge and culvert replacement
- Rural addressing system
- Community walkway trails
- Western Navajo water pipeline from lake Powell to Cameron
- All utilities hooked to housing
- Power line extension for homes in Gray Mountain and all homes in North Cameron chapter
- Water line extension in Ward Terrace and Black Falls
- Solid waste transfer station
- Water development and watering points
- Police/fire Station (Public Service Complex)
- Humane Society

2.17.2 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008c, pg. 3-13):

- Early Head Start Program
- Farmers Market/Equipment Rental
- Women's Shelter

- Gravel/sand pit
- Pendleton Wool Industry
- Tourist Complex to include RV park, tourist shops, museum, visitor center, and support services
- Native Health food store
- Upgrade corrals used by community (branding, etc.)
- K-12 school facility
- Vocational, GED, tech. school
- Extended college education
- Shuttle to Flagstaff and Grand Canyon
- Community airport

2.17.3 Phase 3 Projects: 10-15 Years

The following represents the project identified by one small group as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008c, pg. 3-13):

- Renewable energy institute

2.18 Preferred Development Sites

The Chapter identified several areas as ideal locations for future development (WHP 2008c, pg. 3-14):

2.18.1 Housing Development

Chapter choices as to where to locate and where not to locate concentrated land development have been consistent over time. The plan is for housing development to occur in the five-mile stretch of U.S. Highway 89 south of the Little Colorado River (with the Dzil Libei Elementary School at the southern end of that corridor, about three miles south of the U.S. Highway 89 and AZ Highway 64 intersection).

The Chapter House site is on the west side of U.S. 89, one-half mile south of the Little Colorado River Bridge. The site is described as five parcels totaling nearly 30 acres. Three existing parcels comprising 16.5 acres include the Chapter House, the USFS modern hogan, the preschool, the current location of the log plant, and a building that might be able to be renovated for one of the community social and health services uses. Also, there are 13.5 acres of proposed additions to the land area (WHP 2008c, pg. 3-14).

The Chapter has made the decision to put both a health care clinic and a dental clinic on the "chapter tract." Other potential uses would be a senior citizens center and depositories to serve basic needs for hay and other commodities. There is an existing housing development to the south of this site. The location of the existing housing, however, is unlikely to be a suitable location for new residences because the soil is sand overlain with gravel (WHP 2008c, pg. 3-14).

2.19 Economic Development

Areas identified for economic development include the Highway 89 Business Corridor. This is the largest of the development sites and is centrally located within the planning area. To capitalize on its proximity to the U.S. Highway 89 and AZ Highway 64 intersection, the Chapter's plans consist of attractive commercial street fronts that offer a mix of commercial uses. These include retail, office space, lodging and restaurants, a park with a picnic area, a visitor center, and an art gallery. The commercial mix would be compatible with market demand, development practices (for example, the business site lease process), and land uses of the surrounding area (WHP 2008c, pg. 3-15).

Four specific areas within this Highway 89 Business Corridor are highlighted below (WHP 2008c, pg. 3-15).

2.19.1 Little Colorado River Business Park

Because this area has spectacular views of the Little Colorado River to the south and vast expanses beyond, the Chapter can capitalize on these beautiful gifts from nature and establish a business along the riverfront on either side of U.S. Highway 89. Such a business should feature the views from this site (WHP 2008c, pg. 3-15).

2.19.2 Western Diné Gateway Commerce Center

The development at the U.S. Highway 89 and AZ Highway 64 intersection should be characterized as a Highway Oriented General Commercial Development designed to facilitate pedestrian access and provide for good circulation of motorized traffic. Tourist amenities, as well as retail convenience and personal services, should make up this commercial center (WHP 2008c, pg. 3-15).

2.19.3 Halgai Tó Industrial Park

The development of an industrial site should be on land large enough to adequately support this type of development, including possible expansion. Businesses should typically consist of those requiring on-site storage of materials and offer structures for operations and direct access to trucking routes. Examples include warehousing, repair shops, wholesale distributors, and light manufacturing. The proposed industrial site is located in the southern portion of the Chapter along U.S. Highway 89 (WHP 2008c, pg. 3-15).

2.19.4 Shadow Mountain Business Park

The proposed development of the U.S. Highway 89 business corridor is envisioned as a highway service area oriented towards the traveling public with the ability to also cater to the needs of area residents (gas stations, motels, restaurants, etc.).

Economic development is also planned for the Little Colorado River Gorge Development. This unique area consists of the narrow gorge of the Little Colorado. In many ways, this wonderful natural resource is

as breathtaking as the Grand Canyon. In addition to preserving and maintaining it, the Chapter also wishes to capitalize on this resource through both tourism and commerce. Presently, two overlooks along the gorge have rest areas with picnic tables to provide leisure for tourists. Native vendors sell their handmade crafts at both overlooks. The Chapter intends to further develop each overlook. Small, fee-based walking trails, either guided or self-guided, can be established so that tourists can view this fantastic creation of nature (WHP 2008c, pg. 3-15).

2.19.5 First and Second Overlooks

Vendors are currently set up to sell their arts and crafts at this site. The future development plans are designed to provide attractive vendor spaces and to reinforce the site's commercial uses, unique identity and character, and educational or informational features. The parks development program should be compatible with the preservation of natural areas and the unique character of "vendor spaces" and prominent views (WHP 2008c, pg. 3-15).

2.19.6 East Gate Grand Canyon Development

Within this unique area, the community has a vision for business establishments that would accommodate and target the tourists entering and leaving the Grand Canyon National Park. These businesses would capitalize on its unique location where the Navajo Nation meets the Grand Canyon National Park. This location is at the western edge of the Chapter (WHP 2008c, pg. 3-16).

Economic development is also planned for the Dzil Lichii Sheep Camp. Within this unique area, the community has a vision for a Navajo bed and breakfast establishment. This business would capitalize on its unique location where the Little Colorado River flows into the Grand Canyon. This location is in a very sensitive wildlife zone; hence, the bed and breakfast would be designed to fit in with the natural environment without the basic amenities of electricity and running water (WHP 2008c, pg. 3-16).

Further economic development is also planned for the Tó Bee Hwíísgáni Development. Within this area, community members wish to develop a business park in addition to community facilities and housing. The community desires for this area to grow and prosper. The business venture could provide needed services to the people from the community, but also it could provide services for tourists who travel through the area. Capturing this tourist traffic could also keep tourists in the Chapter's region longer where they may spend money at other facilities (WHP 2008c, pg. 3-16).

3. Coalmine Canyon Chapter

Also known as Leejin ha gid, the Coalmine Canyon Chapter is located in the southwestern part of the Navajo Nation. The Chapter is approximately 402,357 acres in size. Tolani Lake is to the southeast, and Leupp is to the south. One hundred percent of the Chapter's 402,357 acres is within the FBFA (WHP 2008d, pg. 1-3). The entire Chapter was affected by the Freeze.

The Freeze had a significant emotional and physical effect on this Chapter, because many Navajo people lived on lands partitioned to the Hopi Tribe within what was considered the Coalmine Mesa Chapter. Due to this legislation, most of the community relocated from Coalmine Mesa to Coalmine Canyon, New Lands, or elsewhere, although a few Navajo people remained in the Hopi Partitioned Land under a lease agreement with the Hopi Tribe. When the community moved the Chapter from Coalmine Mesa to Coalmine Canyon four miles to the east, the Chapter officially changed its name from Coalmine Mesa Chapter to the Coalmine Canyon Chapter. The move resulted in grazing permits with much less acreage as compared to their original acreage. Many Chapter residents had to sell off a number of livestock resulting in a shift away from livestock grazing, an important Navajo tradition (Navajo Times 2013).

Although the Chapter struggled at times, even holding Chapter meetings in random places such as the rodeo grounds, the community is striving to move forward. It has built a new chapter house where it now holds regular planning meetings. Indeed, additional success has been realized to some extent with the construction of a large residential development, the new chapter house, expanded electric lines, and waterline service to homes near the chapter house (WHP 2008d, pg. 1-5).

3.1 Coalmine Canyon Chapter Physical Setting

Coal Mine Canyon sits at the edge of the 120-mile wide Painted Desert, a sparsely settled region without many roads but covered by extensive areas of exposed, weathered rock. The Chapter House sits on the rim of Coalmine Canyon within the dramatic landscape view of San Francisco Peaks, Navajo Mountain, and the western rim of the Grand Canyon.

The Coalmine Canyon Chapter landscape consists of low, broad mesas, high plateaus and wide valleys with gently rolling desert grasslands, sand dunes, and hills (H. Sandoval 2002). Elevation within the land varies from a low of 4,700 feet above mean sea level (AMSL) on the Little Colorado River to a high of 6,000 feet AMSL near the Chapter House. Slopes range from 0-77 percent (WHP 2008d).

Lechii OiH, the areas around Ward Mesa, and the lands in the far northeast portion of the Chapter have some of the steepest slopes. The region between the Little Colorado River and Ward Mesa is flat, while the upper areas of the Chapter lands are punctuated by several terraces with steep cliffs (Coalmine Canyon CLUP 2-28).

The Chapter is less than 70 miles away from the Grand Canyon National Park, which received 4.4 million visitors in 2007 (WHP 2008d). Highway 89 runs north from Flagstaff through the Coalmine Canyon Chapter. This route is a heavily traveled route that brings significant tourist traffic through the Chapter

(WHP 2008d). Tourism in the Coalmine Canyon Chapter is a valuable resource the Chapter wishes to address in their development plans (WHP 2008d).

3.2 Coalmine Canyon Chapter Land Status

The Coalmine Canyon Chapter land status is trust land with no private holdings. The vast majority (95%) of the Coalmine Canyon Chapter was affected the Freeze even though 100% of the Chapter acreage is located within the FBFA. This is due to the Chapter's proximity to Tuba City, the administrative area for the Western Agency of the Navajo Nation. This small portion of the Chapter that crossed the Western Agency administrative area was exempted from the Freeze. The Chapter was reduced to five percent of the 1955 Chapter land area, and is based on its grazing district boundary (WHP 2008d, pg. 2-27).

3.3 Coalmine Canyon Chapter Land Use

The majority of the Chapter's land is used for grazing cattle and sheep. Coalmine Canyon is located within Grazing District 3 and Sub-Unit 5. Ranching and sheep herding have been a major occupation and a way of life in the Chapter for many years. These activities have strong connections to the customs and cultural heritage of Chapter residents. Many residents who graze livestock have homesites and family clusters located in remote areas of the Chapter (WHP 2008d, pg. 2-40).

Grazing District 3-1 is within the Tuba City Western Agency. According to BIA records, there were 165 grazing permittees in Grazing District 3-1 in 1940. Today, there are about 100 permittees (WHP 2008d, pg. 2-40).

The lack of an adopted range management plan has resulted in deteriorating conditions. Overgrazing has caused increased soil erosion and inadequate vegetation for livestock. Most grazing areas are not clearly identified or fenced. This has resulted in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally and culturally sensitive areas such as steep slopes, riparian corridors, and AOA.

3.4 Coalmine Canyon Chapter Population and Housing

The 2010 US Census lists the Chapter population as 691 individuals. The majority of homes are owner-occupied and are single detached homes (WHP 2008d, pg. 2-8). The majority of homes were built between 1980 and 1989; since that period home construction has slowed or stopped. The median year for a structure built in the Chapter is 1978 (WHP 2008d, pg. 2-9).

Two new subdivisions, an NHA subdivision and the Relocation homes, were completed in 2002. The southern and southeastern portion of the community tract is designated as single residential housing. It is in this area that the 60 new homes are situated (WHP 2008d, pg. 2-12).

Most of the residences are located in the Coalmine Canyon Chapter community tract which consists of 414 acres of tribally withdrawn land in the northwest corner of the Chapter located along Highway 264

near the Chapter House (WHP 2008d, pg. 2-45). Many of the homes in the Chapter are of poor construction quality (WHP 2008j), and most of the homes within in the Chapter have been affected by the restrictions on improvements placed on the FBFA. According to field data conducted by WHPacific in 2008, 59 percent of homes in the Coalmine Canyon Chapter are in poor to very poor condition and 22 percent are in good to very good condition (WHP 2008d, pg. 2-10).

3.5 Coalmine Canyon Chapter Government and Utility Infrastructure

The Chapter House, built in 2004, serves as a local governance center for the community and houses the Public Employment Program (PEP) and the housing construction and renovation assistance program (WHP 2008d, pg. 2-15).

Several major electricity providers, including the Salt River Project (SRP), Arizona Public Service (APS), and the NTUA, own or operate transmission lines within the Chapter's planning area. Only the NTUA provides electricity to the Community tract and nearby residents located in the northeast portion of the planning area along Highway 264 (WHP 2008d, pg. 2-57).

In 2002 NTUA extended a three-phase line to the new Community. This line provides electricity to the new homes located in the Community tract as well as to the Chapter House and several homes outside the tract (WHP 2008d, pg. 2-57).

The Questar "Southern Trails" pipeline spans the northwestern portion of the planning area from Moenkopi to Cameron. ARCO constructed the pipeline in 1957 to move crude oil from the Four Comers area to California. In 1977, ARCO reversed the pipeline's direction and used it to transport oil from Southern California to the north. Questar purchased the pipeline in 2002, converted it to a natural gas pipeline, and activated only the portion west of the Colorado River. The pipeline is again flowing in the southwesterly direction, carrying natural gas from San Juan basin in the Four Comers area. Although several companies draw gas from Questar's pipeline, they do not provide service to the Chapter's planning area (WHP 2008d, pg. 2-59).

Communications include telephone, radio, television, Internet, and newspaper. Citizens Communications is the primary provider of telephone service in Kerley Valley. Growing coverage of the Navajo Nation by cellular telephone service has begun to replace the need for landline service in some cases, especially for personal communications; however, some businesses may require the stability of landlines. Improvements to the capacity of the landline system are called for in the proposed development areas. Continuing to improve telecommunications can build stronger business links that can help stimulate commercial development opportunities (WHP 2008d, pg. 2-59).

Presently, there are no solid waste disposal sites within the Chapter. An area has been designated for a solid waste transfer station within the community tract. The proposed area is fenced, but lacks the necessary facilities to operate a solid waste transfer station (WHP 2008d, pg. 2-59).

Limited areas of the Chapter are served by public water systems. Kerley Valley, the community tract, residents surrounding and near the community tract, and residents north of Cameron are the only areas served by public water systems. These water systems are owned and operated by the NTUA (WHP 2008d, pg. 2-53).

The Chapter community at Coalmine Canyon has IHS/NTUA-provided water for the subdivision and 12 homes nearby. The homes in the Kerley Valley access the Tuba City community water service. The homes located north of Cameron access an IHS/NTUA waterline serving homes north of the Little Colorado River. There are no individual wells (WHP 2008d, pg. 2-53).

Many families rely on individual wells for drinking water. Water hauling is common practice and can be difficult for some families, particularly the elderly, as it requires significant time and effort. The residents in the southwest part of the Chapter have been informed by Indian Health Services (IHS) that their well water has unsafe levels of uranium and should not be used as drinking water. Possible solutions to provide safe drinking water to the area include (1) a reverse osmosis process to purify the well water; (2) the extension of waterlines (the nearest point that waterlines now reach is Tolani Lake); and (3) hauling water on a regular schedule and in large quantities (WHP 2008d, pg. 2-53).

There are about 10 livestock windmills in the Chapter (WHP 2008d, pg. 2-53).

3.6 Coalmine Canyon Chapter Environmental Safety Status

Coal is found just north of the Chapter House, and a vein of coal less than 10 feet thick is exposed along the rim of Coalmine Canyon in the northern portion of the Chapter. Across Highway 264 is a nonfunctioning coal mine, about a mile north of the Chapter House. This mine operation was abandoned because of an extensive underground fire that smoldered for nearly 10 years, according to local residents. Evidence of the burn is still visible after 20 years of weathering (WHP 2008d, pg. 2-42).

From the 1940s through the 1970s, hundreds of uranium mines were opened throughout the Navajo Nation, including the western portion of the Chapter. Within the planning area, uranium ore was first discovered in Ward Terrace near Gold Springs in 1950 (WHP 2008d, pg. 2-42).

Uranium was mined from these areas until 1960. Abandoned for years, the pits were reclaimed by 2000. Sand and gravel also exist within the Chapter. There are at least two gravel borrow pits within the community. One such pit is located just east of the Chapter House, and the other is located along N 6731, eight miles southwest of Tuba City. Pumice and clay are other minerals found in the area, and they are located on the western part of the Chapter, near the Little Colorado River (WHP 2008d, pg. 2-42).

The residents in the southwest part of the Chapter have been informed by Indian Health Services (IHS) that their well water has unsafe levels of uranium and should not be used as drinking water (WHP 2008d, pg. 2-53).

The Chapter would like to have a study funded on effects of uranium mining will help the Chapter create a program for restitution for health effects. Existing uranium mines and test pits will be closed and remediated to prevent further contamination (WHP 2008d, pg. 3-2).

3.7 Coalmine Canyon Chapter Water

3.7.1 Surface Water

The Chapter lies primarily within two watersheds within the Little Colorado River basin, which is part of the larger Colorado River watershed basin. The area is drained to the west by the Little Colorado River. The Little Colorado River is a tributary of the Colorado River, approximately 315 miles long. It rises in eastern Arizona and in southeastern Apache County and flows northwest through a series of deep gorges past the southwestern portion of the Chapter. It joins the Colorado River in the Grand Canyon, approximately 70 miles north of Flagstaff. The Little Colorado River comes in from the Southeast and flows to the northwest, along the southwestern and western edge of the Chapter. A smaller but significant tributary, Moenkopi Wash, bounds the northern part of the Chapter and drains the northwestern escarpment of Black Mesa. The flow from this wash drains to the Little Colorado River (WHP 2008d, pg. 2-37).

Other smaller tributaries of the Little Colorado River also drain the area; however, the water is lost by evaporation or re-infiltrates before the flow reaches the Little Colorado River. Many of these tributaries are unnamed. (WHP 2008d, pg. 2-37).

3.7.2 Ground Water

The Chapter is located in the Little Colorado River Basin where water-bearing rocks consist primarily of sandstone, limestone, and other conglomerates. Several distinct aquifer systems underlie the Little Colorado River Basin. The main water source for the Chapter is the Navajo aquifer, which dominates the higher plateau region at the 6,000 ft. level. The Coconino aquifer is in the valley along Highway 89 near the Little Colorado River. An existing well within the Community tract brings water from the Dakota Aquifer (WHP 2008d, pg. 2-35).

3.7.3 The Coconino Sandstone

The C-aquifer system yields water of good chemical quality except southwest of Leupp and in the northern part of the Black Mesa basin where excessive amounts of dissolved solids could render it unfit for use. The C-aquifer includes the Coconino Sandstone, the De Chelly Sandstone, the Moenkopi Formation, and the Shinarump Member of the Chinle Formation. The Coconino Sandstone is of very fine to medium-grained, well-sorted quartz grains. The grains are coarse near the southern extend of the unit along the Mogollon Rim and grade into a finer grain size to the north. The De Chelly Sandstone is a thick-bedded fine- to medium-grained sandstone and hydraulically connected with the Coconino and the Shinarump Member of the Chinle Formation. The Chinle and Moenkopi Formations consist primarily of mudstone and siltstone beds. The Chinle Formation and the De Chelly and Coconino Sandstones are the primary sources of groundwater. The other members of Chinle Formation and the Moenkopi Formations are too fine-grained and act as aquicludes. The C-aquifer system thins rapidly to the north and pinches out along the Utah-Arizona border (WHP 2008d, pg. 2-35).

3.7.4 The Navajo Aquifer

The quality of the water within this system is excellent. The Lukachukai member of the Wingate Sandstone, the Moenave Formation, the Kayenta Formation, and the Navajo Sandstone comprise what is referred to as the N-aquifer. The Lukachukai Member consists of a fine to very fine-grained quartz sandstone that is homogeneous throughout the region. The Moenave Formation consists of two sandstone members that include Dinosaur Canyon and the Springdale Members. These consist of coarse- to very-fine-grained quartz sandstone with a large percentage of silt and firm calcareous cement (WHP 2008d, pg. 2-35).

The Kayenta Formation consists of a sandstone facies and a silt facies; the form is bonded with calcareous cement. The Navajo Sandstone is composed of medium- to fine-grained quartz sandstone and is bodied with weak calcareous cement. The sandstone contains many lenticular beds of cherty limestone. Because of their homogenous lithologies and loose cementation, the Navajo Sandstone and Lukachukai Member of the Wingate Sandstone are the primary water-producing units in the N-aquifer system (WHP 2008d, pg. 2-35).

3.7.5 The Dakota Aquifer

The Dakota is a significant aquifer in the region. The system includes the Entrada Sandstone, Summerville Formation, Cow Springs Sandstone, sandstone members of the Morrison Formation, and the Dakota Sandstone. The Entrada Sandstone and Summerville Formation both consist of a sandstone and silty sandstone facies. In both cases, the silty facies is well cemented. The Cow Springs Sandstone is well-sorted, fine-grained quartz that is also firmly cemented. These deposits are extensive, encompassing the southern half and western portion of the region. The sandstone tongues are quite extensive and intertwine with members of the Morrison (WHP 2008d, pg. 2-35).

The Morrison Formation is the uppermost Jurassic unit in the region, and is comprised of four members. These are from oldest to youngest: (1) the Salt Wash Member, which consists of fine- to coarse-grained lenticular sandstone beds and mudstone; (2) the Recapture member, which consists of friable fine- to medium-grained sandstone interstratified with shaly mudstone; (3) the Westwater Canyon Member, which consists of fine- to coarse-grained sandstone and minor shaly mudstone; and (4) the Brushy Basin Member, which consists of shale interbedded with some mudstone and fine- to medium-grained sandstone. The Cretaceous Dakota Formation is comprised of three lithologic types deposited under fluvial, lagoonal, and shallow marine conditions. The lower fluvial member consists of well-cemented, medium- to fine-grained quartz sandstone with a basal conglomerate in some places. The middle member consists of carbonaceous flat-bedded mudstone and siltstones, coal, and interbedded sandstone lenses. The upper shallow marine sandstone member differs somewhat in lithology from the lower because it has a greater amount of very fine sand and silt and in several areas forms alternating sandstone ledges and intercalated shaly beds. The water quality is marginal to unsuitable for drinking due to sulfate and dissolved solids concentrations exceeding the U.S. Public Health Service's recommended drinking water limits (WHP 2008d, pg. 2-36).

3.7.6 Wetlands and Floodplains

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. There are some recorded wetlands in the Chapter mainly in association with riverine and freshwater forested shrub areas along the Little Colorado River and fresh water ponds located south of the community of Coalmine Canyon (US Fish and Wildlife Service 2016). Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas surrounding Coalmine Canyon, Arizona, dated September 3, 2010, showed no flood prone areas (FEMA 2016).

3.7.7 Water Rights

Water rights from the Colorado River have been tied up in litigation for many years. Chapter residents feel they should have access to the Colorado River, based on historical use. The Chapter needs to look into acquiring water rights to the Colorado River and Little Colorado River in order to provide water to the community (WHP 2008d, pg. 4-18).

3.7.8 Chapter Water Needs

According to field data collected by WHPacific in 2008, 32 percent of homes in the Chapter use septic systems and 28 percent use outhouses. The lack of wastewater infrastructure in the Chapter explains the high occurrence of septic systems and outhouses (WHP 2008d, pg. 2-55).

Many scattered-site homes are not connected to municipal water systems due to their remoteness and cost and the inefficiency of extending these systems to isolated locations. At the same time, the Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Those homes located close to existing water systems should be hooked up. Those too far from existing systems should be retrofitted for plumbing and provided nearby watering points where safe water for drinking and domestic use can be collected and hauled (WHP 2008d, pg. 3-5).

Many of the homes in the Chapter use septic systems to handle wastewater. While septic systems sometimes pose environmental risks, particularly to the water table, in higher density residential areas and areas with a high water table, meaning groundwater is close to the surface and therefore at high risk for contamination from septic tanks, the issue with septic tanks in Coalmine Canyon is more due to the remoteness of residences (WHP 2008d, pg. 2-55).

Septic tanks require occasional servicing to empty the tanks and flush the lines. The remoteness of many scattered sites homes means that these services cost more than they would to service areas that are easier to reach and closer to Page or Flagstaff, where private service companies are located. Many residents of these remote homes subsist on ranching and may not have the additional cash to pay for septic tank servicing, no matter what the cost of service is. As a result, many septic systems are abandoned once the tank is full, and residents resort to using outhouses or simply letting sewage pool and evaporate naturally, which poses a human health risk. Addressing this issue will require policy decisions and perhaps new programs to either provide financial assistance to cover the cost to service septic tanks or provide public

services to empty septic tanks, which will also necessitate constructing a facility where collected waste can be safely treated (WHP 2008d, pg. 2-55).

The Chapter needs to develop a wastewater reclamation facility that thoroughly cleans wastewater so that effluent does not pollute streams or groundwater. The water released by this treatment facility could potentially be used to irrigate landscaping and parks (WHP 2008d, pg. 3-5).

3.8 Coalmine Canyon Agricultural Resources

3.8.1 Community Farmers

Coalmine Canyon residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Most of the agriculture that occurs within this Chapter, and the majority of the Navajo Nation, is defined by small family farms sized between 0.1-9.0 acres (US Census of Agriculture 2014).

In order to perpetuate the type of farming traditional to the Navajo, Chapter members would like to cultivate small farms to produce food for Chapter members. This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community (WHP 2008d, pg. 3-11).

3.9 Coalmine Canyon Soils

Generally, three primary soil categories occur within the planning area, including soils MAl, MA2, and MA6. The primary soil type in the Chapter is MAl, with less occurrence of MA2. Even less of the MA6 soil type is in existence, and that is mostly along the Little Colorado River (WHP 2008d, pg. 2-33).

The soils in MAl, Badland-Torriorthents -Torrifluvents Association, are shallow to deep, moderately fine-textured material from eroded from rock formations. Badland makes up about 40 percent of the association, Torriorthents 25 percent, and Torrifluvents 25 percent, with minor areas of associated soils and rock outcrop being about 10 percent. The Moenkopie-Shalet-Tours Association (MA2) consists of well-drained soils on plateaus and flood plains. The soils in MA2 are shallow and deep, moderately-coarse to moderately-fine textured. Moenkopie soils make up about 60 percent of the association, Shalet soils 15 percent, Tours soils 15 percent, with minor areas of associated soils being 10 percent (WHP 2008d, pg. 2-33).

The Fruitland-Camborthids-Torrifluvents Assocation (MA6) consists of well-drained soils on the high plains. The plains are broken by occasional steep-sided drainage ways and scattered buttes. Fruitland soils and closely associated unnamed shallow and moderately deep Torriorthents make up about 50 percent of the association, Camborthids 30 percent and Torrifluvents 15 percent, with small areas of rock outcrop and minor included soils being 5 percent (WHP 2008d, pg. 2-33).

Land Suitability sites for development were identified in the CLUP 2008, and the Chapter should continue to consider soil profiles in regards to suitable development sites within the FBFA.

3.10 Coalmine Canyon Biological Resources

3.10.1 Threatened and Endangered Species and Resource Protection Zones

Portions of the Chapter contain some sections classified by NNDFW as Resource Protection Zone 1, a highly-sensitive wildlife resource area. Within the Chapter, Area 1 incorporates the Little Colorado River, the Ad'ee Chii Cliffs, and Coalmine Canyon. The Little Colorado River is protected with a buffer zone from thick riparian vegetation to protect the yellow-billed cuckoo and southwestern willow flycatcher. The remaining area within the Chapter is designated as Resource Protection Zone 3, which is considered a low sensitivity area. (WHP 2008d, pg. 2-39).

3.11 Coalmine Canyon Mineral Resources

3.11.1 Minerals

Coal is found north of the Chapter House, and a vein of coal less than 10 feet thick is exposed along the rim of Coalmine Canyon in the northern portion of the Chapter. About a mile north of the Chapter House, on the other side of Highway 264, is a nonfunctioning coal mine. This mine was abandoned because of an extensive underground fire that smoldered for nearly 10 years, according to local residents. Evidence of the burn is still visible after 20 years of weathering (WHP 2008d, pg. 2-42).

From the 1940s through the 1970s, hundreds of uranium mines were opened throughout the Navajo Nation, including the western portion of the Coalmine Canyon Chapter. This led to construction of open pits along the Little Colorado River, and uranium was mined from these areas until 1960. Abandoned for years, the pits were reclaimed by 2000 (WHP 2008d, pp, 2-42).

Sand and gravel also exist within the Chapter, and there are at least two borrow pits within the community. One borrow pit is located just east of the Chapter House, and the other is located along N 6731, eight miles southwest of Tuba City. Pumice and clay are also found in the area, and they are located on the western part of the Chapter, near the Little Colorado River (WHP 2008d, pp, 2-42).

3.12 Coalmine Canyon Cultural and Traditional Resources

3.12.1 Cultural Resources

The community of Coalmine Canyon is rich in archeological sites. There are significant archaeological sites including historic and prehistoric ruins, burial grounds, and inscriptions made by human groups. The cultural sites in the planning area include the presence of surface artifacts that appear to indicate a substantial subsurface component (WHP 2008d, pp, 2-44).

Many archaeological inventories have been conducted in the chapter, and numerous archeological sites have been recorded with the NNHHPD. Prior to development of any kind, the NNHHPD, Chapter Officials, chapter members should be contacted to conduct a records check of the inventory of currently known cultural resources in the project area. A cultural resources survey of each project area should also be performed before any development begins (WHP 2008d, pp, 2-42).

The Chapter has also identified AOA, as previously discussed in the Coalmine Canyon Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

3.13 Coalmine Canyon Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (Coalmine Canyon CLUP).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

3.13.1 Coalmine Canyon Development Vision

The Chapter envisions a community where its people can live and prosper, without limitations to their land, in a safe and self-sustaining environment with a growing, balanced, and diversified economy that prudently uses its natural and cultural resources, enhances employment opportunities, and improves the quality of life for its people (WHP 2008d, pg. 3-1).

The Coalmine Canyon Chapter would like to achieve this vision in the following way (WHP 2008d, pg. 3-2, 3-3);

Economic development will improve quality of life for the Chapter and retail and recreational opportunities for tourists. Ranchers will have nearby water resources for livestock. Chapter vendors will be able to sell Navajo arts and jewelry to tourists. Affordable groceries will be available at a store within the Chapter. A business incubator will help local entrepreneurs start new businesses. The Chapter will also have expanded government facilities such as a tribal court facility and a post office to better serve the region.

Future economic development opportunities including a 70-acre destination resort and casino with amusement park style entertainment for younger visitors will help attract tourists to the area and will generate income. Small retail developments including a convenience store, a vending market, and a rug auction will create more employment opportunities within the community and create supplemental

income to the resort and casino. Future large-scale developments including a regional mall could be supported if the casino proves to be popular. Commercial developments including a laundromat, automotive repair business, and fast food restaurants will provide retail and service amenities to the community.

Chapter residents will have a full range of education opportunities from school age through adulthood, including childcare, job training, leadership cultivation, culture and language sharing, and personal and business finance management. New or improved facilities will provide the best opportunities for students.

Better transportation infrastructure will provide safe and adequate public access to and within the community and support the movement of goods and services throughout the region. The most heavily traveled roads will be paved, and the Chapter will have equipment to properly maintain unpaved roads.

Community facilities and parks will provide places for Chapter members to congregate. A baseball field, a skate park, and a multi-purpose center will provide space for residents to participate in athletic activities. Picnic grounds near the Canyon will allow tourists and residents alike to appreciate the beauty of the land.

Nearby emergency health, fire, and police facilities and substations will provide quick response to medical and safety emergencies. Helicopter service to Tuba City will be available to respond to major emergencies. All homes will be given addresses for emergency response and within range of reliable cell phone service.

A study on effects of uranium mining will help the Chapter create a program for restitution for health effects. Existing uranium mines and test pits will be closed and remediated to prevent further contamination.

All residents who wish to live in Coalmine Canyon will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members can live in scattered homesites if they are grazers who prefer to live a subsistence lifestyle, or clustered housing developments if they prefer the amenities and infrastructure of a modern community. Mobile home parks, apartments, and rental houses will be available for people who may need to move from the Chapter in the future or for people who are in immediate need of a home. Living facilities for the elderly will allow independence while also providing assistance with preparing food, social opportunities, and medical care.

3.13.2 Guiding Development Principles

With the development goals, in mind the Chapter has developed guiding principles that would apply to each development project (WHP 2008d, pg. 3-5). The Chapter would like to provide for people's basic needs, such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service needs improvement to better respond to emergency situations (WHP 2008d, pg. 3-5).

Sustainable construction should be required for all new buildings. These buildings should be energy-efficient and designed to last many generations. Structures should be designed to work with the land in order to provide passive solar energy to further reduce energy costs, achieving the goal of Chapter self-sufficiency (WHP 2008d, pg. 3-5). These structures should provide optimal protection from the elements with high-quality insulation to better regulate indoor temperatures and raised floors to protect against flooding.

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community (WHP 2008d, pg. 3-5).

The Chapter needs to protect and provide scattered housing as an option for remote areas and ranchers. Fencing around homes and cornfields will help keep cattle away from property that is easily damaged. Grazing areas should be located where cattle can be easily watched. Grazing should be protected as an ongoing way of life for people in the Chapter. The Chapter must educate grazing-permit holders on better range management practices and work to enforce these practices to ensure that this way of life can remain sustainable (WHP 2008d, pg. 3-5).

The Chapter needs to plan to provide jobs for the large and growing young population. According to Chapter members during the workshops, many members have moved to other communities in order to find employment. Creating jobs within the Chapter is essential to keeping younger population within the Chapter, or at least providing that opportunity (WHP 2008d, pg. 3-5).

New housing subdivisions should be built near necessary resources. Housing clusters should be constructed in areas where water and electricity is already available. These housing developments sites should also be located with easy access to community amenities such as emergency access (WHP 2008d, pg. 3-6).

It is important for the community to plan ahead before proceeding with growth. The Chapter needs to protect natural resources such as water, wildlife, and cultural areas. Plans need to be created to handle the hazards of new industrial opportunities before committing to new operations (WHP 2008d, pg. 3-6).

3.14 Coalmine Canyon Chapter Development Obstacles

The Coalmine Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them. Some of the Chapter sees communication, range management, fairness of policies and procedures, protection of cultural and natural resources, and creation of internal Chapter support as obstacles (WHP 2008d, pg. 3-4, 3-5).

3.15 Coalmine Canyon Chapter Strategic Directions

In order to surpass these development obstacles, the Chapter has identified strategic directions for each obstacle. For improved communication, the Chapter can identify and appoint key community spokespersons to represent projects. These leaders would form a project committee that communicates with the Chapter leadership. Chapter officials need to explain and discuss new plans face to face with community members. The site selection process should become a public process that includes current nearby residents. Communication through local media will help notify residents of upcoming meetings and projects (WHP 2008d, pg. 3-4).

For improved range management, the Chapter needs to deputize a grazing officer to patrol Chapter grazing lands on horseback. Grazing permits need to be redefined to establish clear criteria and accountability. Written agreements should be used whenever possible to define grazing permits and agreements. The management plan should limit permits to one year, with a three-month monitoring period. In addition to the grazing officer, a local range rider should provide additional enforcement support. A fee should be introduced for windmill use to prevent abuse of water use. Partnerships with neighboring range management plans will avoid conflicts with grazers in other chapters (WHP 2008d, pg. 3-4).

To ensure enforcement of fair policies and procedures the Chapter will need to ensure that officials at the local level are fairly administering and enforcing policies and procedures. All rules should be applied fairly and equally. A checks-and-balances system will help ensure the fairness of the government. Chapter members need to hold leaders accountable for their promises (WHP 2008d, pg. 3-4).

Protecting cultural resources and traditional ways will be ensured by making culturally and religiously specific counseling available to Chapter members. This type of counseling should respect the needs and beliefs of the Chapter people. The Chapter needs to coordinate with other map providers to help locate and preserve historical sites. The Chapter should engage in a public education and awareness campaign about these sites. All sacred, culturally important, and historic sites need to be inventoried, even if they are not maintained on a map, and archaeologically evaluated (WHP 2008d, pg. 3-4).

Regulations for these preservation areas need to be established. Regulations for off-road vehicle use around these sites need to be established and enforced (WHP 2008d, pg. 3-4). The Chapter needs to decide as a community how to pass knowledge of and responsibility for these sites from elders to younger generations (WHP 2008d, pg. 3-5).

Conservation of natural resources is important to Chapter members. Not only is it part of the people's heritage, it is necessary for living with the limited resources available on Chapter land. The Chapter needs to develop a wastewater reclamation facility that thoroughly cleans wastewater so that effluent does not pollute streams or groundwater. The water released by this treatment facility could potentially be used to irrigate landscaping and parks. Careful site selection for new developments will help ensure minimal environmental impact (WHP 2008d, pg. 3-5).

The Chapter can create internal support by hiring support such as a grant writer or planner will help the Chapter better support government at the local level. The Chapter also needs to find ways to generate income to help fund projects and make up for funding shortfalls (WHP 2008d, pg. 3-5).

3.16 Coalmine Canyon Chapter Community Needs

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

3.16.1 Infrastructure

Improved cellular communications infrastructure will improve quality of life and safety for all residents. Some rural Chapter members do not have cell phone service or other telecommunications service at their homes. People have to drive to locations where cell phone service is available in order to make a phone call, a major inconvenience and huge safety issue in emergencies, as it adds time to emergency response. In addition to spotty cellular communications, Internet access is also sparse but could be provided easily in designated areas with wireless service (WHP 2008d, pg. 3-6).

Many scattered-site homes are not connected to municipal water systems due to their remoteness and cost and the inefficiency of extending these systems to isolated locations. At the same time, the Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Those homes located close to existing water systems should be hooked up. Those too far from existing systems should be retrofitted for plumbing and provided nearby watering points where safe water for drinking and domestic use can be collected and hauled (WHP 2008d, pg. 3-6).

As part of the FBFA Recovery Plan, a system of residential zones is being proposed to distinguish among those homes close enough to hook up to existing municipal water systems, those homes already in close proximity to safe watering points, and those homes in remote locations that must haul water from long distances. There are two major issues facing those in remote homes. One is the cost, stress, and labor of hauling the water from far away to their homes – a particular burden for elderly residents living alone and their families who help care for them. Another is the risk that many people in these remote areas resort to using water from nearby windmills or earthen dams instead of traveling long distances to a safer water source. Water from windmills and earthen dams, intended for livestock use, is not tested for water quality and is at risk for airborne and bacterial contamination from contact with animals (WHP 2008d, pg. 3-6).

Improving access to safe domestic and drinking water, as well as water for livestock and irrigation, will rely on policy decisions about how best to provide water in remote locations (WHP 2008d, pg. 3-6). Providing more safe watering points is one approach; providing a regional system of water delivery might be another. Technology exists to solve any number of problems, once the community decides on what problem to solve and what a successful solution will look like. Some solutions will be more costly or more efficient than others, but strong leadership and clear decision-making, starting at the chapter level, will still be needed to set the parameters of what solutions the community demands (WHP 2008d, pg. 3-7).

The municipal water service needs new waterlines to replace the existing copper waterlines that have exceeded their useful life. The existing water service needs to extend beyond the current service area, and additional water storage tanks are needed to handle the additional demand (WHP 2008d, pg. 3-7).

Similarly, a system with a range of power-source solutions based on distance from existing power lines could provide electricity to all residences in the Chapter. Those closest to existing or planned power lines would be hooked up. Those in more remote areas could be retrofitted or built to use solar power with wind-powered backup generators. A maintenance service for this off-the-grid utility service would also need to be established (WHP 2008d, pg. 3-7).

There is a landfill located within the Chapter. This landfill is beyond its useful life and does not meet modern environmental standards. It needs to be closed and reclaimed. Trash collection is limited and unreliable in the Chapter. There is no dedicated solid waste transfer station in the Chapter. Trash collects in numerous locations, which creates a health hazard. The use of trash dumpsters will prevent blowing waste from polluting the landscape. A recycling center will reduce the amount of household waste that goes to a landfill. A program is needed for cleaning illegal dumpsites that occur, especially along drainage areas and washes (WHP 2008d, pg. 3-7).

3.16.2 Transportation

Community members voiced deep concerns regarding accessibility and the need for improvement and maintenance of all roads within the Chapter. The non-paved roads become very muddy and impassable during inclement weather. The road serving the northeastern part of the Chapter is proposed for paving. This road extends from Highway 264 and travels north around Coalmine Canyon (WHP 2008d, pg. 3-7).

Road improvements are also desired for a portion of N6720 near Goldsprings. This area floods during inclement weather and becomes impassable. The main arterial road paralleling the Little Colorado River is also proposed for paving. This road serves the southwestern portion of the Chapter (WHP 2008d, pg. 3-8).

3.16.3 Housing

At the community planning workshops, participants identified the top need as housing, particularly in the FBFA. Chapter members desire new homes constructed of long-lasting materials. A diversity of housing types is needed within the Coalmine Canyon Chapter. Group homes for the elderly are needed to house the aging population. In the past, many newly constructed homes were provided to elders, leaving young

families in need of housing. Clustered housing is needed in the central community area near municipal utilities and other community amenities. There is also a need for mobile homesites and apartments, which are ideal for residents who do not have time to acquire a homesite lease or who might want to move elsewhere in the future (WHP 2008d, pg. 3-8).

3.16.4 Health and Public Safety

Response time to emergencies throughout the Chapter is too long to assure public safety. Chapter members have expressed a need for a police substation within the FBFA of the Chapter. The nearest emergency health facility is in Tuba City. A quick responding helicopter unit is needed to provide expedited response to medical emergencies. Many homes within the Chapter do not have physical addresses. These homes need to be given addresses in order to help emergency personnel locate a site (WHP 2008d, pg. 3-9).

As of 2008, the Navajo Nation has been working on a rural addressing system for 911 emergency response. This project will map and assign an address to all homes in the Chapter. Chapter members expressed a need for a local trauma center within the Coalmine Canyon town site and a second satellite health clinic in the FBFA. A care center for the aging population is also needed (WHP 2008d, pg. 3-9).

3.16.5 Community Facilities, Parks, and Recreation Needs

Community facilities and services are an important part of the community vision. A senior citizens center is needed for the aging population in the Chapter, and a daycare is needed for children younger than pre-school age. A multi-purpose community center will provide a place for community members to congregate for recreational activities or community meetings. Coalmine Canyon also needs a cemetery within the Chapter. Community recreation facilities will also be an important element in improving the quality of life for people in the FBFA. Community facilities provide a place for youth and adults alike to congregate. A skate park for teenagers and playground equipment for younger children are desired by the Chapter for youth. A boys and girls club would also provide activities for the Chapter youth. Chapter members also desire a recreation center and firing range (WHP 2008d, pg. 3-9).

3.17 Economic Development

The Chapter needs economic development projects to strengthen the community. Many people in the Chapter are skilled artisans. A rug auction and a vending market will provide a place for Chapter members to sell their wares. A business incubator is needed to help people in the region achieve their entrepreneurial goals. Many residents of the Chapter are ranchers who raise livestock. A nearby veterinarian is needed to help ranchers care for medical issues of livestock. The Chapter is surrounded by beautiful landscapes and geologic sites. A tourist attraction at the meteor crater will attract more people into the Chapter and help generate income (WHP 2008d, pg. 3-10).

A healthy diversified economy provides many opportunities for jobs, education, and improved health as well as a widely shared and sustainable quality of life and environment, pride in one's own community and hope for the future. A thriving economy is also important for the Chapter because an increased tax

base will enhance the community's livability or viability by supporting, maintaining, and improving roads, Chapter facilities, and emergency medical services. Job development will provide higher skills, better wages, benefits, and opportunities for advancement. Local businesses will feel appreciated by the community and be more likely to stay in town. Further, locally produced goods are more likely to be consumed at the local level and the productivity of the land can be maximized while still preserving the environment (WHP 2008d, pg. 3-10).

3.18 Education

The Chapter wishes to improved education. Although there are numerous educational opportunities for the school-age population, there are no educational services for adults and the population younger than kindergarten age. Adult and continuing education services are far from the community. There are no pre-schools or childcare facilities near Coalmine Canyon. The lack of facilities for the younger population can make finding childcare difficult for working families with young children (WHP 2008d, pg. 3-10).

The Chapter needs to secure funding for continuing education programs and pre-school programs. An educational needs assessment needs to be conducted in order to justify new schools within the Chapter (WHP 2008d, pg. 3-10). Suitable sites need to be identified and withdrawn for any new facility. The Chapter will have to coordinate with other government agencies to secure funding for new educational facilities and programs (WHP 2008d, pg. 3-11).

3.19 Open Space, “Areas of Avoidance,” and Grazing Needs

Raising grazing animals is a way of life for people in the Chapter. Much of the land within the Chapter is leased to grazing-permit holders. Over time, poor range management has caused problems on grazing land. There is not a ranger station near the Chapter to support the patrol of grazing land. Grazing animals have been reported stolen, and some permit holders have exceeded limits of livestock numbers. The Chapter needs to provide grazing areas that can be easily watched (WHP 2008d, pg. 3-11).

Poor range management has also resulted from the lack of land conservation programs and education. Much of the grazing lands are not fenced, thus allowing grazing animals near homes, agriculture sites, and environmentally sensitive areas such as steep slopes. Range management education, increased range enforcement, and fencing are needed in order to allow grazing to continue within the Coalmine Canyon Chapter (WHP 2008d, pg. 3-11).

Agriculture and farming are also important to the way of life for the people of the Coalmine Canyon Chapter. In order to perpetuate the type of farming traditional to the Navajo, Chapter members could cultivate small farms to produce food for Chapter members. This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community (WHP 2008d, pg. 3-11).

Coalmine Canyon’s desert landscape home is delicate. The Chapter needs to create programs to protect water quality, wildlife, and minerals in the area. During the community workshops, participants identified several “areas of avoidance.” These areas need to be inventoried and perhaps mapped. If necessary, these

sites should be fenced in order to keep grazing animals away from sites that could be damaged, and regularly patrolled to protect against vandalism and unsanctioned poaching (WHP 2008d, pg. 3-11).

3.20 Coalmine Canyon Chapter Priority Capital Improvement Projects

These needs are fully outlined in the Coalmine Canyon 2008 CLUP (WHP 2008d). Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top five projects the residents would like to see occur first include a communications tower, a casino (70-acres, with hotel, fast food), a nursing home near chapter, auto repair/auto parts store, and a power line extension for 80 families along Highway 264 in a one-half mile radius from the Chapter House (WHP 2008d, pg. 3-12).

3.20.1 Coalmine Canyon Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008d, pg. 3-12).

3.20.2 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008d, pg. 3-14):

- Church development (Azee 'Bee Nahaga)
- Memorial/community cemetery (10 acres)
- Community garden - corn, squash, tomatoes
- EMT/ambulance service
- Nursing home near Chapter
- Independent Living Project - senior citizen housing close to Chapter House, w/garden, sheep, activities (30 acres)
- Affordable houses (40 homes)
- Trailer Park
- Cell Tower
- Power line extension for 80 families along Hwy 264 (1 1/2 mile radius from Ch. House)
- Solar power with wind power backup generators - 24 families farthest from the existing power lines
- Solid waste transfer station and dumpsters
- Water for livestock with faucet near Chapter

- Land fill at Ward Terrace
- Communal grazing area - big
- Communal grazing area - small
- Baseball field
- Skate park
- Recreation trail - windmill to Tuba City
- Road improvements and future roads, N6720 route
- Road grader

3.20.3 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008d, pg. 3-15):

- Truck stop - gas station, fast food, convenience store, laundry, grocery, auto repair, auto parts
- Public safety complex - police and fire dept.
- Post office
- School: pre-school through high school - including special needs facilities
- Health clinic - diabetes dialysis, counseling offices (grief/trauma)
- Phone/Internet/cable lines - 150 families in 414-acre Resettlement Tract
- Multi-purpose community center - youth recreation center/gym for sports
- Paved roads to homes
- Casino (70-acres, with hotel, fast food)
- Library
- Rug auction/vending market
- Adult education facility / science lab / college extension courses / higher education / vocational facility - training programs in sustainable building / maintenance (wind generators, etc.) / contractor certification / Project Management training
- Waterlines to houses – for 32 to 55 families in Goldsprings
- Tree planting program
- Fencing for cornfield
- Park with basketball and picnic grounds
- E.M.T./ambulance service
- Pave Coalmine Road from Sand Springs to Tolani Lake

3.20.4 Phase Projects: 10-15 Years

The following represents the project identified by one small group as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for

local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008d, pg. 3-15):

- Scattered housing - self-sustainable and remote housing - south (40 homes)
- Museum and cultural center
- Close and clean landfill

3.20.5 Preferred Development Sites

The Chapter identified several areas as ideal locations for future development (WHP 2008d, pg. 3-14):

Most of these potential development sites are located along US Highway 89 and US Highway 160. Additional centers are proposed along Arizona Route 99 and Navajo Route 2 in Leupp and Tolani Lake (WHP 2008d, pg. 4-18).

Several potential development sites were identified at locations away from the business centers. These include locations suitable for wind power generation, agricultural development, and home based businesses. Potential sites for wind farm development are in Cameron just west of Gray Mountain, in Coalmine Mesa along the escarpment of Adeii Echii Cliff. A feasibility study was requested to verify the potential for wind power generation in these locations. Agricultural projects are geared to on-site improvements, such as earthen dams to create livestock ponds, moveable and permanent fencing, and pasture improvements. These projects are dispersed throughout the Chapter and would benefit individual sites. The appropriate project might be designed as a program of technical and financial assistance (WHP 2008d, pg. 4-18).

4. Coppermine Chapter

The Coppermine Chapter is located in the southwestern part of the Navajo Nation. The Chapter is approximately 244,580 acres in size. Tuba City is to the southeast, Bodaway Gap is to the west and south, and Lechee is to the north. The western planning boundary is defined by Echo Cliffs, the eastern edge runs through Mormon Ridge, the southwestern end follows Crooked Ridge to Gap, and the north point goes almost to the Colorado River. This area covers well over 240,000 acres (WHP 2008e, pg. 1-5). Thirty-eight percent of the Chapter's 244,580 acres is within the FBFA (WHP 2008e, pg. 1-1), and these acres are located in the southern portion of the Chapter (WHP 2008e, pg. 1-5).

The Chapter was started in the 1930s when an open-pit copper mine was founded. A trading post associated with the mine was also built. The Chapter House was built in 1959 in a remote area, just south of the mine and trading post. The road to the Chapter House remains unpaved. The mine has been closed since 1968, and the trading post has also been abandoned (WHP 2008e, pg. 1-5).

4.1 Coppermine Chapter Physical Setting

Chapter elevations range from 4,800 to 7,000 feet above sea level. Echo Cliffs, Cedar Tree Hills, and Cornfield Valley are along the southwest study boundary. Marble Canyon is located northwest of the northern end of Coppermine's study area. Circular White Ridge runs along the northeast study area in a north/south direction, and Mormon Ridge runs along the southeastern edges of the study area. Crooked Ridge is the southern edge of Coppermine's study area. The Gap is outside but at the southernmost tip of the study area (WHP 2008e, pg. 2-27).

Slopes greater than 50 percent were calculated for the Coppermine planning area. These slopes are predominantly along the Echo Cliff region along the southwest edge of the planning area, including Antelope Pass (WHP 2008e, pg. 2-27).

Steep slopes are generally unsuitable for intense development. Level and more moderate slopes constitute the majority of the study area. Figure 13 shows areas with slopes greater than 50 percent, which is unsuitable for construction (WHP 2008e, pg. 2-27).

4.2 Coppermine Chapter Land Status

The Chapter is located within Navajo Nation Land Management District 3 and consists of one community, rangeland, and open space. The Chapter is comprised of trust land with no private holdings. The Coppermine 2008 CLUP (WHP 2008e) does not contain any information regarding land disputes within its border (WHP 2008e, pg. 2-25).

4.3 Coppermine Chapter Land Use

The majority of the Chapter's land is used for grazing cattle and sheep. Coppermine is located within Grazing District 1 and Sub-Unit 3 (WHP 2008e, pg. 2-25). Ranger stations to patrol grazing land within the Chapter are located at a distance of at least 174 miles away, in Chinle and Shiprock.

The lack of ranger stations within the Chapter has resulted in insufficient range enforcement. There is also a lack of range preservation programs and public education in the Chapter. The lack of an adopted range management plan has resulted in deteriorating conditions. Overgrazing has caused increased soil erosion and inadequate vegetation for livestock. Most grazing areas are not clearly identified or fenced. This has resulted in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally and culturally sensitive areas such as steep slopes, riparian corridors, and AOA (WHP 2008e, pg. 2-25).

4.4 Coppermine Chapter Population and Housing

The 2010 US Census lists the Chapter population as 590 individuals. The Chapter has one community where some tribal members reside, Coppermine. In 2008, it was estimated that 70 percent of the existing Chapter homes are scattered (WHP 2008e, pg. 4-3).

The majority of homes are owner-occupied, but there are a considerable number of vacant homes. The Chapter's owner-occupancy rate is lower than the Navajo Nation's and Arizona's largely due to residents maintaining seasonal homes for recreational and livestock activities. The majority of homes (95%) in the Chapter are single detached homes (WHP 2008e, pg. 2-8).

The majority of homes were built between 1970 and 1998. This high rate of older homes in combination with the improvement restrictions of the Freeze might indicate that a significant number of homes need rehabilitation or replacement (WHP 2008e, pg. 2-9).

4.5 Coppermine Chapter Government and Utility Infrastructure

Infusing Chapter residents with a spirit of community was identified as a priority in the 2008 community workshops. The Chapter lacks residents as many younger families with children have moved away to seek a higher quality of life and opportunities elsewhere (WHP 2008e, pg. 3-4). This is reflected in the Chapter's lack of a business plan that prioritizes community projects and establishes a process of what needs to be done, such as withdrawing land for development. Many of the funds released by the federal government have an expiration date. Since the government often only provides a small fraction of funding to a project, the expiration date passes before the Chapter can collect the remainder of funds. The Chapter feels that very little tribal funding trickles down to the Chapter to complete projects (WHP 2008e, pg. 3-4).

The availability of utilities is very limited throughout most of the Chapter. A number of wells and springs are scattered throughout the Chapter. There are 22 Chapter wells and one NTUA public water system well within the Chapter planning area. Despite the number of wells, there are few home-sites that are hooked into a water delivery system. The well sites are primarily for livestock and have not been treated for safe human consumption. The majority of community members have to haul water to the homes. Small earthen dams were created to capture surface drainage for livestock watering holes (WHP 2008e, pg. 2-35).

There is no wastewater infrastructure in the Chapter. Most Chapter members rely on outhouses and septic tanks. Almost 64 percent of homes use outhouses. Approximately 18 percent of the homes in the Chapter use septic systems to handle wastewater. While septic systems sometimes pose environmental risks, particularly to the water table in higher density residential areas and areas with a high water table, meaning groundwater is close to the surface and therefore at high risk for contamination from septic tanks, the issue with septic tanks in the Chapter is more due to the remoteness of residences. Septic tanks require occasional servicing to empty the tanks and flush the lines (WHP 2008e, pg. 2-35).

The remoteness of many scattered-site homes means that these services cost more than they would to service areas easier to reach and closer to Page or Flagstaff, where private service companies are located. Many residents of these remote homes subsist on ranching and may not have the additional cash to pay for septic tank servicing, no matter what the service costs. As a result, many septic systems are abandoned once the tank is full, and residents resort to using outhouses or simply letting sewage pool and evaporate naturally, which poses a human health risk. Addressing this issue will require policy decisions and perhaps new programs to either provide financial assistance to cover the cost to service septic tanks or provide public services to empty septic tanks, which will also necessitate constructing a facility where collected waste can be safely treated (WHP 2008e, pg. 2-35).

The major NTUA power lines run parallel to N-20 and along N20A. With funding sources from various Departments of the Navajo Nation (for example, NTUA, Abandoned Mines), homes are gradually being plugged into the electrical grid. According to the 2008 field study, almost 54 percent of homes are not connected to the power. Existing electricity infrastructure is shown Figure 18 below (WHP 2008e, pg. 2-35).

Natural gas is not available to the Chapter. A majority of the Chapter members use wood and coal for heating. Bottled propane is also available; however, it is imported from Flagstaff and Tuba City (WHP 2008e, pg. 2-37).

Frontier Communications, formerly Navajo Communications Company, serves the telecommunication needs of the Navajo Nation. It provides landline telephone service, leases tower spaces to cellular companies, and offers cable television service. The Navajo Nation Telecommunications Regulatory Commission is responsible for planning the expansion of service coverage and delivery across the Navajo Nation, by both public and private companies. Cellular One and Verizon offer the best coverage for private cellular services on the Navajo Nation, although reception is often reported as unreliable and spotty (WHP 2008e, pg. 2-37).

The Chapter does not have a solid waste collection service. Currently, trash collects in various areas of the Chapter, causing health hazards for residents (WHP 2008e, pg. 2-37).

4.6 Coppermine Chapter Health and Public Safety Status

The closest police station and medical service to the Coppermine Chapter House is in Page, twenty-two miles away. Most homes in the rural areas of the Chapter do not have physical addresses. As of 2008 the Navajo Nation has been working on a rural addressing system that will tie phone numbers to a physical address in order to provide 911 emergency responses. This project will require that all homes in the Chapter be mapped and assigned an address (WHP 2008e, pg. 2-11).

According to the Chapter, most residents go to Tuba City Indian Medical Center, Page Medical Center, or Flagstaff Medical Center for medical attention (WHP 2008e, pg. 2-12).

4.7 Coppermine Chapter Water

4.7.1 Surface Water

There are no major surface water features within the Chapter (WHP 2008e, pg. 2-29). A number of Chapter wells and springs are scattered throughout the Chapter. There are 22 Chapter wells and one Navajo Tribal Utility Authority (NTUA) PWS well within the Chapter planning area. The well sites are primarily for livestock and have not been treated for safe human consumption (WHP 2008e, pg. 2-34).

4.7.2 Ground Water

The main water source for the Chapter is the N aquifer which dominates the higher plateau region at the 6,000 ft. level. The quality of the water within this system is excellent. The Lukachukai member of the Wingate Sandstone, the Moenave Formation, the Kayenta Formation and the Navajo Sandstone comprise what is referred to as the N-aquifer system.

4.7.3 Wetlands and Floodplains

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. There are no recorded wetlands in the Chapter (US Fish and Wildlife Service 2016). Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that there is no Flood Insurance Rate Map (FIRM) panel for the unincorporated areas surrounding Coppermine, Arizona (FEMA 2016).

4.7.4 Water Rights

There is no discussion of water rights issues within the Coppermine CLUP (WHP 2008e).

4.7.5 Chapter Water Needs

Improved water tanks at windmills are needed to better serve the water hauling stations. If water in these tanks at the windmill will be used for human consumption, then water quality should be regularly monitored. Water storage tanks are needed for each house that is not connected to piped water (WHP 2008e, pg. 3-6).

Improving access to safe domestic and drinking water, as well as water for livestock and irrigation, will rely on policy decisions about how best to provide water in remote locations. Providing more safe watering points is one approach; providing a regional system of water delivery might be another. Technology exists to solve any number of problems, once the community decides on what problem to solve and what a successful solution will look like. Some solutions will be more costly or more efficient than others, but strong leadership and clear decision-making, starting at the chapter level, will still need to set the parameters of what solutions the community demands (WHP 2008e, pg. 3-6).

4.8 Coppermine Agricultural Resources

4.8.1 Community Farmers

Coppermine residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Ranching and farming are important aspects of the community. Much of the land within the Chapter is leased to grazing-permit holders. Overgrazing has caused problems on grazing land and farmland. There is a need for a range management plan to protect grazing and farming areas (WHP 2008e, pg. 3-9).

4.8.2 Coppermine Soils

Much of the Chapter has limited vegetation due to overgrazing and ongoing drought conditions to stabilize the soil conditions during windy or rainy weather. Undifferentiated soil erosion areas are identified along the western and northern perimeter of the planning area. Remaining areas within the Chapter contain moderate soil erosion classification based on slopes of 1%–25% (WHP 2008e, pg. 2-30).

Land Suitability sites for development were identified in the CLUP 2008, and the Chapter should continue to consider soil profiles in regards to suitable development sites within the FBFA.

4.9 Coppermine Biological Resources

4.9.1 Threatened and Endangered Species and Resource Protection Zones

Portions of the Chapter contain some sections classified by the NNDFW as Resource Protection Zone 1, a highly sensitive wildlife resource area. This Zone is located on the extreme western border of the Chapter

and represents less than twenty percent of the Chapter. The remaining area within the Chapter is designated as Resource Protection Zone 3, which is considered a low- sensitivity area (WHP 2008e, pp, 2-33).

4.10 Coppermine Mineral Resources

4.10.1 Minerals

Coconino Copper and Chemical Company opened a large- open-pit mine in the 1880s from which the Chapter takes its name (Navajo Times 2013). The mine closed in 1968 and has since been reclaimed by Abandoned Mine Lands, along with the smaller holes in the Chapter (Navajo Times 2013).

4.11 Coppermine Cultural and Traditional Resources

4.11.1 Cultural Resources

The NNHHPD has inventoried and mapped the locations of several archeological sites and previous project locations, but the entire chapter has not been inventoried. NNHHPD does not reveal the locations of sensitive cultural sites due to the potential for vandalism, robbery, and the need to protect privacy. Hence the specific locations of cultural sites are not identified on maps.

Coppermine Chapter has identified numerous sites where traditional cultural properties are found and all of them have significant meaning to Navajo culture and traditions. Any cultural sites within the Chapter should also be preserved.

The Chapter has also identified AOA, as previously discussed in the Coppermine Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

4.12 Coppermine Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (WHP 2008e).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

4.12.1 Coppermine Vision

The Coppermine Chapter would like to achieve this vision in the following way (WHP 2008e, pg. 3-1).

The Coppermine Community needs to work together to achieve their goals of economic independence in order to develop community facilities to provide services for families, youth, and the elderly.

4.13 Coppermine Chapter Goals

4.13.1 Guiding Principles

With the development goals, in mind the Chapter has developed guiding principles that would apply to each development project (WHP 2008e, pg. 3-5). The Chapter would like to provide for people's basic needs, such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service needs improvement to better respond to emergency situations (WHP 2008e, pg. 3-5).

Sustainable construction should be required for all new buildings. These buildings should be energy-efficient and designed to last many generations. Structures should be designed to work with the land in order to provide passive solar energy to further reduce energy costs, achieving the goal of Chapter self-sufficiency (WHP 2008e, pg. 3-5). These structures should provide optimal protection from the elements with high-quality insulation to better regulate indoor temperatures and raised floors to protect against flooding.

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community (WHP 2008e, pg. 3-5).

Many members have moved to other communities in order to find employment and better opportunities. Creating jobs and improving the educational system and facilities within the Chapter is essential to keeping younger population within the Chapter (WHP 2008e, pg. 3-6).

4.13.2 Coppermine Chapter Goals

During the community workshops held during summer 2008, community members outlined goals for the Chapter that will aid in reaching this vision. These goals include community policies, capital projects, and community service (WHP 2008e, pg. 3-1).

All residents who wish to live in Coppermine will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members will be able to live in scattered homesites if they are grazers

who prefer to live a subsistence lifestyle, or clustered housing developments if they prefer the amenities and infrastructure of a modern community. Clustered housing will be located in Gap (WHP 2008e, pg. 3-1).

Because of the high cost of providing municipal infrastructure to remote houses in the Chapter, solar power with wind-powered back-up generators will be used to provide electricity to scattered rural homes. Rural homes will also have improved access to safe drinking water sources if the cost of connecting them to municipal services is too high (WHP 2008e, pg. 3-1).

The Chapter will provide educational and training opportunities for residents and entrepreneurs to learn how to maintain these off-the-grid utilities. Living facilities for the elderly will allow independence while also providing assistance with preparing food, social opportunities, and medical care. These facilities should be located in the community of Gap or in Habitiin (WHP 2008e, pg. 3-2).

A health clinic will address the trauma due to the former Bennett Freeze, contain a pharmacy, and provide health to all Chapter members. Nine acres have been will be set aside in the Chapter for a health clinic (WHP 2008e, pg. 3-2).

Chapter residents will have a full range of educational opportunities from school age through adulthood, including childcare, job training, leadership cultivation, and culture and language. New or improved facilities will provide the best opportunities for students. The Chapter wishes to improve education, including an 8th to 12th grade educational facility, distance learning, and GED program for Chapter members (WHP 2008e, pg. 3-2).

A multi-purpose community and senior center will provide a place for community members to congregate for recreational activities or community meetings. A cemetery will allow Chapter members continual connections to their homeland (WHP 2008e, pg. 3-2).

Infrastructure within the community will be improved, particularly within the FBFA, to provide water and electricity to all residents. The water table will be surveyed. Solid waste will be collected safely and reliably at a Chapter transfer station. Improved cellular communications infrastructure will improve quality of life and safety for all residents (WHP 2008e, pg. 3-2).

Economic development will improve quality of life for the Chapter. Retail and recreational opportunities for tourists will improve the local economic base. An RV park with all amenities and a restaurant will attract travelers (WHP 2008e, pg. 3-2).

Better transportation infrastructure will provide safe and adequate public access to and within the community and support the movement of goods and services throughout the region. The most heavily traveled roads will be paved and a fee will be charged to travel on them. The road system will be improved and maintained to be safe and efficient in all weather conditions and seasons (WHP 2008e, pg. 3-2).

Nearby emergency health, fire, and police facilities and substations will provide a quick response to medical and safety emergencies. Helicopter service to Tuba City will respond to major emergencies. All homes will be assigned addresses for emergency response and will be within range of reliable cell phone

service. The health, fire, and police services will be connected by an efficient and reliable communications system (WHP 2008e, pg. 3-2).

Ranching, farming, and raising grazing animals will continue to be a rich and viable way of life in this part of the Navajo Nation. A nearby ranger station will help to manage rangelands and prevent criminal activities such as theft of livestock. A range management plan and windmill will help preserve the quality of the land and maintain this means of subsistence. A Humane Society will care for malnourished animals. Ranchers will have a nearby feed store for livestock. Farms will be located near individual scattered homesites (WHP 2008e, pg. 3-2).

Community facilities and parks will provide places for Chapter members to congregate. Picnic grounds and development of Antelope, Mormon, and "The Cut" trail will allow tourists and residents alike to appreciate the beauty of the land (WHP 2008e, pg. 3-2).

4.14 Coppermine Chapter Obstacles

4.14.1 Obstacles

The Coppermine Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them;

Funding is limited and difficult to obtain from the Navajo Nation, Western Navajo Agency, and other funding sources, but funds are needed to build facilities and make improvements. Every chapter is competing for the same limited funds. The chapter with a dedicated committee that has effective leadership and advocates their chapter's projects obtains the most resources (WHP 2008e, pg. 3-3).

Much of the planned development will require land to be withdrawn from the current grazing user. Grazing-permit holders want compensation for land withdrawn from their use and have a right to appeal the land withdrawal process. The process of land withdrawal is a difficult political process (WHP 2008e, pg. 3-3).

The Chapter has had difficulties in following through with community development ideas provided within the previous land use plans. The Chapter cannot complete projects because the process to withdraw land is cumbersome and restrictive and prevents progress (WHP 2008e, pg. 3-3).

A lack of qualified personnel with planning and construction experience in the Chapter has created problems with some services. The Chapter has not been able to fill planning positions because there is limited training available for Chapter members, and it is difficult to attract qualified personnel (WHP 2008e, pg. 3-3).

The Chapter has had difficulty completing projects because of a lack of funding. According to Chapter residents report that the high cost of construction, limited Chapter funds, and widespread funding shortfalls at the Nation level have led to very little funding for the Chapter (WHP 2008e, pg. 3-3).

When the Chapter does receive funding, projects are funded in a piecemeal manner, resulting in many projects without enough funding. There is no business plan that prioritizes community projects and establishes a process of what needs to be done, such as withdrawing land for development. Many of the funds given by the federal government have an expiration date. Since the government often only provides a small fraction of funding to a project, the expiration date passes before the Chapter can collect the remainder of funds. Very little tribal funding trickles down to the Chapter to complete projects, and the State of Arizona will not fund projects on tribal land (WHP 2008e, pg. 3-4).

4.14.2 Strategies around the Obstacles

The following categories represent strategic directions the Chapter can take in addressing the obstacles summarized above in order to achieve the community vision (WHP 2008e, pg. 3-4).

Chapter members identified a need to establish a community outreach program. The program would increase community participation and educate community members in how to develop and follow through with goals and objectives presented in the CLUP. In addition, the program would build partnership with other chapters, the Navajo Nation, and other government entities (WHP 2008e, pg. 3-4).

The Chapter needs to develop and adopt a Community Strategic Plan that defines the problems, has long- and short-range goals, and prioritizes projects. The performance of the Chapter should be based on measurable goals, qualitative and quantitative research, and use of the most current practices to obtain the best result. The CLUP should ensure that annual project and plan evaluations are completed, that proposals are submitted in a timely manner, and that financial resources are secured (WHP 2008e, pg. 3-4).

A financial plan is needed to determine the amount of resources needed to address these needs and how resources will be allocated. It will also determine the amount of resources allowed to employ a grant writer and planner to help facilitate this community development process and secure funds from the FBFA Recovery Plan (WHP 2008e, pg. 3-4).

Culturally and religiously specific social and mental health counseling needs to be provided for Chapter members. This type of counseling should respect the needs and beliefs of the community.

Public participation is an important component of the government decision-making process, but the public needs to be reassured that government decisions are impartial, timely, and fair. Chapter members feel that the project approval process is lengthy and unreliable (WHP 2008e, pg. 3-5).

Protecting and reviving culture is important to people in the Chapter. Over the years, language and cultural ways have been lost. Cross-cultural and cross-generational mentoring will help tribal members share their cultural experience and knowledge. The Chapter needs to promote the preservation of the Navajo language by encouraging bilingual education and conversation. Chapter members also need to take responsibility for knowing the legal practices and process that govern the actions and responsibilities of individuals (WHP 2008e, pg. 3-5).

4.15 Resource Needs

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

4.16 Coppermine Chapter Priority Capital Improvement Projects

These needs are fully outlined in the 2008 Coppermine CLUP (WHP 2008f). Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top five projects the residents would like to see occur first consists of nine projects due to several tied votes. The top projects include a pavement and improvement of Road N20 (28 miles), construction of homes on individual homesites within FBFA, a waterline toward Kaibeto West, South, and East, a 3-Phase Power line (West, South, Northeast), and a cell tower (WHP 2008e, pg. 3-10).

4.16.1 Coppermine Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008e, pg. 3-12).

4.16.2 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008e, pg. 3-11):

4.16.2.1 Public Safety

- Ambulance
- Fire station
- Police station
- Communications system

- Rural addressing
- Addressing transition back to community of origin
- Improving governance
- FBFA money going directly to FBFA priorities

4.16.2.2 Health

- 8 acres for clinic
- Senior citizen
- Pharmacy
- Addressing trauma due to FBFA
- Care for disabled citizens
- Women's shelter – near Gap school
- Behavioral health – near Gap school
- Veterans facility

4.16.2.3 Community Facilities

- Telephone/Landline
- Cemetery
- Waste transfer station

4.16.2.4 Infrastructure Utilities

- Wind Power
- 3-Phase power line West, South, North, and East
- FBFA waterline toward Kaibeto West, South, and East
- Define water table and source
- Windmill – water for livestock
- Cell tower
- Solar power – to individual homes that are a distance from powerline – in all of the Chapter area
- Domestic water at feasibility stage – West and South of Chapter area
- Regional water pipeline from Lake Powell

4.16.2.5 Transportation

- Road N20 (28 miles)
- Road N21 (Gap to Kaibeto)
- School bus routes
- Public safety

4.16.2.6 Open Space, Cultural Sites, and Grazing

- Solid waste cleanup (old Trading Post area)
- Preservation at identified sites
- Coppermine Trading Post – historical preservation

- Livestock facilities (branding corrals, etc.)

4.16.2.7 Housing

- Homes on individual homesites in the FBFA

4.16.2.8 Education

- On-line education

4.16.3 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008e, pg. 3-12):

4.16.3.1 Public Safety

- Medic Helipad/airstrip by Gap school

4.16.3.2 Health

- Nursing/Elderly home – near Gap school

4.16.3.3 Economic Development

- Vendor market by old Trading Post
- Flea market
- Rest area by old Trading Post

4.16.3.4 Agricultural Development

- 1st Windmill

4.16.3.5 Transportation

- I.R. 201 pavement
- I.R. 6210 pavement

4.16.3.6 Open Space, Cultural Sites, and Grazing

- Farm near individual homes
- Develop wells, water for irrigation

4.16.3.7 Housing

- Clustered housing (Gap)

4.16.4 Phase Projects: 10-15 Years

The following represents the project identified by one small group as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008e, pg. 3-13, 3-14):

4.16.4.1 Community Facilities

- Boys & Girls Club/Youth Center by Chapter's Multi-Purpose building
- Multi-Purpose building

- Head Start facility
- Senior Citizen Center
- Cultural Center
- Veteran Center – by Chapter House
- Post Office – by Chapter House

4.16.4.2 Infrastructure Utilities

- Natural gas line

4.16.4.3 Economic Development

- Grocery
- Laundromat
- Business park
- Truck stop
- Garage/Gas station
- Visitor Center
- Storage
- Livestock Feed Store
- RV Park w/all amenities
- Eatery
- Rodeo grounds/Sports complex center
- Casino

4.16.4.4 Transportation

- Toll road
- Elderly shuttle
- Future Interstate through Coppermine

4.16.4.5 Open Space, Cultural Sites, and Grazing

- Wildlife preservation (Cedar Tree Hills & Mormon Ridges)
- Preservation of old trails – Lee's Ferry and Marble Canyon
- Preservation of old trails – the Great Western Trails

4.16.4.6 Housing

- Nursing Home (Gap-Habitin)
- Rental units with clustered housing
- Clustered housing units – near Chapter House
- Clustered housing units – by old Trading Post

4.16.4.7 Education

- Charter school (grades 8-12)

- GED program
- Skill Center and Life Skill training center
- Cultural training center (weaving, others) by Chapter House

4.16.4.8 Parks and Recreation

- Antelope Trail development
- "The Cut" horse trail development
- Mormon trail (Echo Cliffs)
- Hiking and backpacking trails
- Guided Tours (ATVs)
- Visitor Center

4.16.5 Preferred Development Sites

The Chapter identified four areas as ideal locations for future residential development (WHP 2008e, pg. 3-15):

4.16.6 Residential and Commercial Development

The first development site is located in the southern portion of the Coppermine planning area, near Windmill 1. It is accessible by N-20, an unpaved road. This land status Navajo Tribal Trust and is currently used as grazing land. The Chapter plans to use this site for future clustered housing developments (WHP 2008e, pg. 3-16). The soil is suitable for building, it is located in a low sensitivity area Resource Protection Zone, and there are no recorded cultural resources (although due to the site density in the area, it is expected cultural resources may need to be mitigated at this site).

Development site 2 is located by Windmill 4, west of ISR #20. The land status Navajo Tribal Trust and is currently used as grazing land. The Chapter plans to develop this land for residential and commercial uses in the future. The soil is suitable for building, it is located in a low sensitivity area Resource Protection Zone, and there are no recorded cultural resources (WHP 2008e, pg. 3-17).

Development site 3 is located next to the former trading post. The land status Navajo Tribal Trust and is currently used as grazing land. The Chapter plans to develop this land to accommodate grazing and residential development in the future. The soil is suitable for building, it is located in a low sensitivity area Resource Protection Zone, and there are no recorded cultural resources (WHP 2008e, pg. 3-18).

Development site 4 is located at the northern end of the Coppermine planning area. The land status is Navajo Tribal Trust and is currently used as grazing land. The Chapter plans to develop this land to accommodate grazing and residential development in the future (WHP 2008e, pg. 3-19). The soil is suitable for building, it is located in a low sensitivity area Resource Protection Zone, and there are no recorded cultural resources (although due to the site density in the area, it is expected cultural resources may need to be mitigated at this site).

5. Kaibeto Chapter

The Chapter is bordered by Lechee, Shonto, Tonalea, and Tuba City Chapters. The name Kaibeto derives from the Navajo word *K'ai'bii to'*, which means "willow in the water." The Chapter consists of the community of Kaibeto, rangeland, and open space. The community of Kaibeto started as a trading post in 1914. A Bureau of Indian Affairs (BIA) school was later built near the community.

The Chapter House was built in 1955, and another BIA school was built after the Chapter House. In the 1970s and 1980s, two NHA subdivisions, several churches, and one clinic were built. Kaibeto's community center consists of three residential subdivisions, scattered-clustered housing, a grocery store, school, warehouse, Chapter House, laundry facility, several churches, sewer lagoons, and an abandoned airstrip.

With the exception of one main paved road, the roads within this central area are all dirt or gravel roads. Some homes are located in the rangeland and tend to be owned by cattle or sheep ranchers. For the most part, utilities have not been extended to these scattered home sites, unless those homes are located along major roads with utilities (WHP 2008f, pg. 1-5).

5.1 Kaibeto Chapter Physical Setting

Kaibeto Chapter is located in northern Arizona near the northern boundary of the Navajo Nation. The size of the Chapter is approximately 237,338 acres. Kaibeto Chapter lies on the Kaibeto Plateau, northwest of Black Mesa. Elevations in this area range from 6,880 feet on White Mesa to 5,700 feet near the community of Kaibeto (WHP 2008f, pg. 1-5).

The area is comprised of gently rolling topography, steep hillsides, rocky ridges, and deep canyons. The vegetation is chiefly piñon and juniper, mixed with grass. The area is drained by Kaibeto Creek, which flows northward toward Lake Powell about 20 miles to the northwest. Geologic rock units exposed in this area primarily consist of the Navajo Sandstone, which is underlain by the Kayenta and Chinle Formations (WHP 2008f, pg. 1-5).

5.2 Kaibeto Chapter Land Status

The Chapter is comprised of trust land with no private holdings. The southern portion of Kaibeto Chapter is located in the FBFA (WHP 2008f, pg. 2-31). The Kaibeto CLUP does not contain any information regarding land disputes within its border.

5.3 Kaibeto Chapter Land Use

The majority of the Chapter's land is used for grazing cattle and sheep (WHP 2008f, pg. 1-5). Kaibeto is located within Grazing District 1 and Sub-Unit 2. Ranger stations to patrol grazing land within the Chapter are located at a distance of at least 155 miles away, in Chinle and Shiprock.

The lack of ranger stations within the Chapter has resulted in insufficient range enforcement. There is also a lack of range preservation programs and public education in the Chapter. The lack of an adopted range management plan has resulted in deteriorating conditions. Overgrazing has caused increased soil erosion and inadequate vegetation for livestock. Most grazing areas are not clearly identified or fenced. This has resulted in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally and culturally sensitive areas such as steep slopes, riparian corridors, and AOA.

5.4 Kaibeto Chapter Population and Housing

The 2010 US Census lists the Chapter population as 1,963 individuals. The Chapter has one community where most tribal members reside, Kaibeto.

The number of housing units in the Chapter is 531. The majority of homes are owner-occupied, and approximately a quarter of homes are vacant. The majority of homes in the Chapter are single detached homes (57%). The Chapter has a higher rate of detached homes than the Navajo Nation (WHP 2008f, pg. 2-8).

Kaibeto currently has three residential subdivisions near the central community area and many scattered site homes in more remote areas. Many of the homes in the Chapter are of poor construction quality, and many in the FBFA have become very run-down due to the restrictions on improvements. According to field data conducted by WHPacific in 2008, 53 percent of homes in the Chapter are in poor to very poor condition (WHP 2008f, pg. 2-9).

Many of the homes in the Chapter are located on scattered home sites and are owned by ranchers. Unless these homes are located near a main road, most have not been connected to utilities (WHP 2008f, pg. 2-9).

5.5 Kaibeto Chapter Government and Utility Infrastructure

The Chapter House was built in 1955, but it is inadequate for use as a community gathering space. The Chapter has withdrawn land near the junction at State Road 98 for a warehouse tract and a youth/activity center. They have also withdrawn land, now under the clearance phase, for a multipurpose building.

The Chapter has not had enough funding to provide a support staff, and they do not have personnel to coordinate community functions. The Chapter has been working on planning efforts, but it has had to hire consultants because it feels no qualified personnel are employed at the local government level to produce plans. In addition, the lack of office space and modern office equipment inhibits the ability to add needed employees (WHP 2008f, pg. 2-14).

The current infrastructure for Kaibeto Chapter includes water, wastewater, electricity, telecommunications, natural gas, and road systems. These systems are generally available to developed areas of the Chapter and limited to areas on the outskirts of the community (WHP 2008f, pg. 2-40).

Wastewater is handled through sewer lagoon systems or septic tanks. The Kaibeto School complex, the two Navajo Housing Authority (NHA) subdivisions, and the Chapter House complex discharge their wastewater to a sewer lagoon located west of the Chapter House. In 2003, under a project funded by the Environmental Protection Agency, Indian Health Service (IHS) added two new cells to the existing three-cell lagoon system. This system is currently at capacity. When new homes and businesses are built or existing home connected to the public wastewater system in Kaibeto, additional capacity will need to be added. According to the 2000 U.S. Census, 42 percent of homes in the Chapter do not have complete indoor plumbing facilities (WHP 2008f, pg. 2-45).

Forty-four percent of the homes in the Chapter use septic systems to handle wastewater (WHP 2008f, pg. 2-45). While septic systems sometimes pose environmental risks, particularly to the water table, in higher-density residential areas and areas with a high water table, meaning groundwater is close to the surface and therefore at high risk for contamination from septic tanks, the issue with septic tanks in Kaibeto is more due to the remoteness of residences (WHP 2008f, pg. 2-45).

Septic tanks require occasional servicing to empty the tanks and flush the lines. The remoteness of many scattered site homes means that these services cost more than they would to service areas easier to reach and closer to Page or Flagstaff, where private service companies are located. Many residents of these remote homes subsist on ranching and may not have the additional cash to pay for septic tank servicing, no matter how much the service costs. As a result, many septic systems are abandoned once the tank is full, and residents resort to using outhouses or simply letting sewage pool and evaporate naturally, which poses a human health risk. Addressing this issue will require policy decisions and perhaps new programs to either provide financial assistance to cover the cost to service septic tanks or to provide public services to empty septic tanks, which will also necessitate constructing a facility where collected waste can be safely treated (WHP 2008f, pg. 2-45).

Electric utilities are built and maintained by the Navajo Tribal Utility Authority (NTUA) for most areas of the Navajo Nation. The main transmission line runs parallel to Route 15. Few or no upgrades to the power system would be necessary, unless the load or demand for the proposed housing subdivision exceeds the available supply. This appears unlikely for a small subdivision. A feasibility study will be requested by the Kaibeto Chapter to NTUA to determine any necessary upgrades to the electrical system (WHP 2008f, pg. 2-47).

Natural gas lines are available to the existing NHA subdivision, and therefore, presumably, gas would be available for future development (WHP 2008f, pg. 2-49). Eighty-seven percent of homes in the Chapter are dependent on bottled, tank, or liquid petroleum (LP) gas and wood sources of heating fuel (WHP 2008f, pg. 2-9).

The majority of Chapter members (63 percent) do not have telephone service available (WHP 2008f, pg. 2-10). Telephone lines are available only to the Chapter House and the NHA subdivision. There are seven pay phones in the community. There are no plans underway to expand these lines at this time. The Kaibeto Chapter provides three computers for public use at the Chapter House (WHP 2008f, pg. 2-49).

The Chapter has withdrawn one acre for a waste transfer station. Currently, trash collects in various areas of the Chapter, causing health hazards for residents (WHP 2008f, pg. 2-49).

Many families rely on individual wells for drinking water. Water hauling is common practice and can be difficult for some families, particularly the elderly, as it requires significant time and effort. The current water system in Kaibeto Chapter was designed and constructed by IHS. It is currently owned and operated by NTUA. The water source stems from two wells that penetrate the N-aquifer. The available water from these wells has reached its current capacity. Any future developments will require either these wells to be deepened or another well sunk (WHP 2008f, pg. 2-40).

The Chapter has installed two new waterlines that serve portions of the Chapter residing in the FBFA; a waterline through Mormon Ridge and a waterline to Mann's Mesa (WHP 2008f, pg. 2-43).

There are about five livestock windmills in the FBFA of the Chapter (WHP 2008f, pg. 2-44).

5.6 Kaibeto Chapter Environmental Safety Status

Due to the remoteness of some scattered site housing, there is an ongoing issue of people drinking water from windmills, which are at risk for bacterial contamination and air-borne contaminants, due to the presence of livestock, and vandalism, due to their remote, unsupervised locations. This issue can be addressed through providing safe drinking water sources closer to these remote homes; a centralized drinking water truck delivery system; and/or improving the water quality testing and treatment of all water sources, including windmills and earthen dams, which will require significant coordination with the relevant existing agencies and departments to expand their role and responsibility in this area (WHP 2008f, pg. 2-43).

5.7 Kaibeto Chapter Water

5.7.1 Surface Water

The Kaibeto Chapter is drained by the Kaibeto Creek, which flows northwesterly toward Navajo Creek and into Lake Powell. Kaibeto Creek contains a number of tributaries that drain the north and northwest sides of White Mesa. The Kaibeto Creek is ephemeral, meaning that it generally flows in response to seasonal precipitation events and snowmelt, but most of the year it is a dry creek (WHP 2008f, pg. 2-36).

5.7.2 Ground Water

Groundwater in this area is found in the Navajo Aquifer (N-aquifer). According to information received from the Navajo Nation Water Resource Management Branch there are wells that tap this aquifer which range from 600 feet to 1,360 feet deep. This aquifer is a valuable source of domestic water supply for this community and other communities in this region (WHP 2008f, pg. 2-40).

5.7.3 The Navajo Aquifer

The quality of the water within this system is excellent. The Lukachukai member of the Wingate Sandstone, the Moenave Formation, the Kayenta Formation, and the Navajo Sandstone comprise what is

referred to as the N-aquifer. The Lukachukai Member consists of a fine to very fine-grained quartz sandstone that is homogeneous throughout the region. The Moenave Formation consists of two sandstone members that include Dinosaur Canyon and the Springdale Members. These consist of coarse- to very-fine-grained quartz sandstone with a large percentage of silt and firm calcareous cement (WHP 2008f, pg. 2-35).

The Kayenta Formation consists of a sandstone facies and a silt facies; the form is bonded with calcareous cement. The Navajo Sandstone is composed of medium- to fine-grained quartz sandstone and is bodied with weak calcareous cement. The sandstone contains many lenticular beds of cherty limestone. Because of their homogenous lithologies and loose cementation, the Navajo Sandstone and Lukachukai Member of the Wingate Sandstone are the primary water-producing units in the N-aquifer system.

5.7.4 Wetlands and Floodplains

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. There are no recorded wetlands in the Chapter (US Fish and Wildlife Service 2016). Floodplain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas surrounding Kaibeto, Arizona, dated September 3, 2010, showed no flood prone areas (FEMA 2016).

5.7.5 Water Rights

Water rights are only mentioned in the CLUP at a regional level, not as a Chapter level project (WHP 2008f, pg. 4-21).

5.7.6 Chapter Water Needs

According to field data collected by WHPacific in 2008, forty-four percent of homes in the Chapter use septic systems and 28 percent use outhouses. The lack of wastewater infrastructure in the Chapter explains the high occurrence of septic systems and outhouses (WHP 2008f, pg. 2-45).

Many scattered-site homes are not connected to municipal water systems due to their remoteness and cost and the inefficiency of extending these systems to isolated locations. At the same time, the Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Those homes located close to existing water systems should be hooked up. Those too far from existing systems should be retrofitted for plumbing and provided nearby watering points where safe water for drinking and domestic use can be collected and hauled (WHP 2008f, pg. 3-3).

5.8 Kaibeto Agricultural Resources

5.8.1 Community Farmers

Kaibeto residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Most of the agriculture that occurs within this Chapter, and the majority of the Navajo Nation, is defined by small family farms sized between 0.1–9.0 acres (US Census of Agriculture 2014).

In order to perpetuate the type of farming traditional to the Navajo, Chapter members would like to cultivate small farms to produce food for Chapter members. This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community (WHP 2008f, pg. 3-15).

5.8.2 Kaibeto Soils

Chapter soils are part of the Sheppard-Fruitland-Rock Outcrop Association except along Kaibeto Creek where the soils are part of the Torriorthents-Camborthids-Rock Outcrop Association. The Sheppard-Fruitland-Rock Outcrop Association consists of somewhat excessively drained and well-drained soils and rock outcrop on plains and plateaus. The plains are broken by prominent mesas, buttes, and escarpments. Steep, rock-walled canyons form the sides of the drainages that traverse the areas. The soils formed in aeolian sandy material weathered from sandstone and shale (WHP 2008f, pg. 2-38).

Sheppard soils make up about 35 percent of the association, Fruitland soils 35 percent, rock outcrop about 15 percent, and minor areas of associated soils and dune land and Badland about 15 percent. The minor soils are mostly small areas of Moenkopie, Shalet, and Palma. The dune land occurs as scattered areas of low, poorly stabilized dunes of eroded shaly materials. These soils pose few limitations for potential homesite development. The sandy texture of the Sheppard soils is a severe limitation to shallow excavations (WHP 2008f, pg. 2-38).

The Torriorthents-Camborthids-Rock Outcrop Association consists primarily of the Grand Canyon area and the major tributaries to the Colorado River. These are shallow and moderately deep, moderately sloping to extremely steep, gravelly, cobbly and stony, moderately coarse to fine-textured soils developed in colluvial and residual materials such as limestone, sandstone, and shale bedrock (WHP 2008f, pg. 2-38).

Torriorthents make up about 65 percent of this association, Camborthids about 15 percent, and rock outcrop about 15 percent. About five percent of the mapping unit is Ustorthents, recent alluvial soils along the tributary drainage ways and the Colorado River, very steep talus materials, and water, including the Colorado River and the Arizona portions of Lake Mead and Lake Powell (WHP 2008f, pg. 2-38).

Land Suitability sites for development were identified in the Kaibeto CLUP 2008, and the Chapter should continue to consider soil profiles in regards to suitable development sites within the FBFA.

5.9 Kaibeto Biological Resources

5.9.1 Threatened and Endangered Species and Resource Protection Zones

Portions of the Chapter contain some sections classified by NNDFW as Resource Protection Zone 1, a highly-sensitive wildlife resource area. Within the Chapter, Area 1 incorporates the Little Colorado River, the Ad'ee Chii Cliffs, and Kaibeto. The Little Colorado River is protected with a buffer zone from thick riparian vegetation to protect the yellow-billed cuckoo and southwestern willow flycatcher. The remaining area within the Chapter is designated as Resource Protection Zone 3, which is considered a low sensitivity area. (WHP 2008f, pg. 2-39).

5.10 Kaibeto Mineral Resources

5.10.1 Minerals

No minerals indicated in Community Land Use Plan 2008.

5.11 Kaibeto Cultural and Traditional Resources

5.11.1 Cultural Resources

The NNHHPD has inventoried and mapped the locations of several archeological sites and previous project locations, but the entire chapter has not been inventoried. NNHHPD does not reveal the locations of sensitive cultural sites due to the potential for vandalism, robbery, and the need to protect privacy. Hence the specific locations of cultural sites are not identified on maps.

The Chapter has also identified AOA, as previously discussed in the Kaibeto Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

While these areas are well-known by many elders and traditional Navajo residents, the younger generation does not necessarily share this knowledge and understanding. There is currently a lively debate about whether these special areas should be mapped or not. Proponents say that mapping helps preserve and pass on this important cultural and spiritual knowledge across generations and into the future; opponents say this information should be passed orally and personally from generation to generation. In either case, it is important for the Chapter to establish a policy and procedure for how to assure that lands planned for development are not areas to avoid. The Navajo Historic Preservation office does have maps of some of these areas, which it can check site by site as project proposals move forward for development (WHP 2008f, pp, 2-39).

Recently, the Chapter has noticed activities that threaten culturally sensitive areas and fragile environments. Four-wheelers have been driving uninhibited through Chapter lands, and tourists have been removing artifacts from Chapter land. These types of activities can do irreversible damage to culturally significant areas and environmentally sensitive areas and must be addressed in order to prevent them in the future (WHP 2008f, pp, 2-40).

5.12 Kaibeto Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (WHP 2008f).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

5.12.1 Kaibeto Development Vision

The Chapter vision captures how Chapter members would like to see their community grow over the next 15 years. In the long-term, Chapter members want to maximize the benefits of modern opportunities, but at the same time maintain the integrity of traditional Navajo culture. Chapter residents want to preserve their rural atmosphere, but bring in modern amenities such as telephones, electricity, and plumbing to all residents who desire them (WHP 2008f, pg. 3-1).

The following statement reflects the Chapter's vision:

The people of Kaibeto are committed to preserving and enhancing the history, culture, heritage, natural resources, and scenic beauty of their environment. It is our belief that through unified local government leadership, utilizing community resources and maintaining family values, we will preserve choices and potential for future generations (WHP 2008f, pg. 3-1).

5.13 Kaibeto Development Goals

During the community workshops held during Summer 2008, community members outlined goals for the Chapter that would aid in reaching this vision. These goals include community policies, capital projects, and community service (WHP 2008f, pg. 3-1).

Community facilities and service are an important part of the community vision. The Chapter wishes to improve education, including expanding educational facilities for the Chapter's youth. A multi-purpose community center will provide a place for community members to congregate for recreational activities or community meetings. A community store will provide jobs and basic necessities for Chapter members and tourists (WHP 2008f, pg. 3-1). Chapter wishes to hire staff to provide additional chapter services and provide ongoing planning efforts in an expanded office space with updated office equipment (WHP 2008f, pg. 3-2).

Infrastructure within the community will be improved, particularly within the FBFA, to provide water and electricity to all residents. Solid waste will be collected safely and reliably at a Chapter transfer station. Improved cellular communications infrastructure will improve quality of life and safety for all residents (WHP 2008f, pg. 3-2).

Because of the high cost of providing municipal infrastructure to remote houses in the chapter, solar power with wind-powered back-up generators will be used to provide electricity to scattered rural homes. Rural homes will also have improved access to safe drinking water sources if the cost of connecting them to municipal services is too high. The Chapter will provide educational and training opportunities for residents and entrepreneurs to learn how to maintain these off-the-grid utilities (WHP 2008f, pg. 3-2).

Community facilities like a multipurpose center, schools, and an adult education center will provide computers and Internet access to support the curiosity, learning, and communication needs of all residents (WHP 2008f, pg. 3-2).

Economic development will improve quality of life for the Chapter and retail and recreational opportunities for tourists. Ranchers will have nearby water resources for livestock. Chapter vendors will be able to sell Navajo arts and jewelry to tourists. Affordable groceries will be available at a store within the Chapter (WHP 2008f, pg. 3-2).

Chapter residents will have a full range of education opportunities from school age through adulthood, including childcare, job training, leadership cultivation, culture and language sharing, and personal and business finance management (WHP 2008f, pg. 3-2).

The road system will be improved and maintained to be safe and efficient in all weather conditions and seasons (WHP 2008f, pg. 3-2).

Community facilities and parks will provide places for Chapter members to congregate. The existing rodeo facility is in poor condition and is not located on a main road. An improved and accessible rodeo ground will attract tourists and bring together residents of all ages (WHP 2008f, pg. 3-2).

Nearby emergency health, fire, and police facilities and substations will provide a quick response to medical and safety emergencies. Helicopter service to Tuba City can respond to major emergencies. All homes will be addressed for emergency response and within range of reliable cell phone service (WHP 2008f, pg. 3-2).

Ranching and raising grazing animals continues to be a rich and viable way of life in this part of the Navajo Nation (WHP 2008f, pg. 3-2). A nearby ranger station will help to manage rangelands prevent criminal activities such as theft of livestock. Range management education programs will help preserve the quality of the land and maintain this means of subsistence (WHP 2008f, pg. 3-3).

All residents who wish to live in Kaibeto will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members will be able to live in scattered home sites if they are grazers who prefer to live a subsistence lifestyle or clustered housing developments if they prefer the amenities

and infrastructure of a modern community. Mobile home parks and rental houses will be available for people who may need to move from the Chapter in the future or for people who are in immediate need of a home. Elderly living facilities will allow independence while also providing assistance with preparing food, social opportunities, and medical care (WHP 2008f, pg. 3-3).

5.14 Guiding Development Principles

Chapter members outlined principles that should be used to guide development and protect culturally and environmentally sensitive land over the next 15 years (WHP 2008f, pg. 3-8).

It is important for the Chapter to provide for people's basic needs such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service need to be improved to better respond to emergency situations (WHP 2008f, pg. 3-8).

Sustainable construction should be required for all new buildings. These buildings should be energy-efficient and designed to last many generations. Structures should be designed to work with the land in order to provide passive solar energy to further reduce energy costs. These structures should provide optimal protection from the elements with high-quality insulation to better regulate indoor temperatures and raised floors to protect against flooding (WHP 2008f, pg. 3-8).

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community (WHP 2008f, pg. 3-8).

The Chapter needs to protect and provide scattered housing as an option for remote areas and ranchers. Fencing around homes and cornfields will help keep cattle away from property that is easily damaged. Grazing areas should be located where cattle can be easily watched. Grazing should be protected as an ongoing way of life for people in the Chapter. The Chapter must educate grazing-permit holders on better range management practices and work to enforce these practices to ensure that this way of life can remain sustainable (WHP 2008f, pg. 3-8).

The Chapter needs to plan for jobs for the large and growing young population. According to Chapter members during the workshops, many members have moved to other communities in order to find employment. Creating jobs within the Chapter is essential to keeping younger population within the Chapter, or at least providing that opportunity (WHP 2008f, pg. 3-9).

New housing subdivisions should be built near necessary resources. Housing clusters should be constructed in areas where water and electricity are already available. These housing development sites should also be located within easy reach of community amenities such as emergency access (WHP 2008f, pg. 3-9).

It is important for the community to plan ahead before proceeding with growth. The Chapter needs to protect natural resources such as water, wildlife, and cultural areas. Plans need to be created to handle the hazards of new industrial opportunities before committing to new operations (WHP 2008f, pg. 3-9).

The Chapter has designated a community planning area three miles across, east to west, and two miles long, north to south. The entire area has been surveyed. The Chapter expects to direct development to this community growth area. The area has complete sewer and power lines. The next phase is to complete streets radiating off the currently paved area, identifying rights of way, and obtaining clearance for streets. This type of advanced planning nicely illustrates the orderly and efficient development of the community over time (WHP 2008f, pg. 3-9).

5.14.1 Kaibeto Chapter Development Obstacles

The Kaibeto Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them. Some of the obstacle the Chapter sees are non-consent by land users and restrictive stipulations communication, insufficient development to entice/attract career people, inaccessibility of infrastructure and resources, loss of culture and language, lack of progress in community development, neglected community security and safety, and the feeling the Chapter has been disrespected as impacted people (WHP 2008f, pg. 3-3, 3-4, 3-5).

5.15 Kaibeto Chapter Strategic Directions

In order to surpass these development obstacles, the Chapter has identified strategic directions for each obstacle. For improved communication, the Chapter can improve visual presentations, such as PowerPoint presentations and can engage an audience much better with strong graphic aides. Mailings to individual Chapter members and radio announcements would inform Chapter members of upcoming meetings. Meals provided during public meetings would draw members to a meeting during lunch or dinner hours. Bilingual presentations are more inclusive for all members (WHP 2008f, pg. 3-5). By scheduling public meetings on weekends, more Chapter members will be able to attend community meetings because fewer members will be at work.

Newsletters sent to Chapter members will inform them of current events and upcoming meetings. Expanded use of the Internet can help the Chapter reach members who are not able to attend community meetings and will allow for feedback beyond the timeframe provided by a meeting. Email and regular mailings should be used to remind members of upcoming elections. It is important to encourage and reward Chapter members to participate in the public process (WHP 2008f, pg. 3-6).

To help stop the loss of culture, the Chapter needs to coordinate with appropriate departments to help locate and preserve historical sites. All sacred, culturally important, and historic sites need to be inventoried, even if they are not maintained on a map (WHP 2008f, pg. 3-6).

The Chapter should engage in a public education and awareness campaign about these sites. Each of the sites should be inventoried and archaeologically evaluated. Regulations for these preservation areas need to be established. Regulations for off-road vehicle use around these sites need to be established and

enforced, providing a designated area or areas for ATV use. Eventually, the Chapter needs to decide as a community how to pass knowledge of and responsibility for these sites from elders to younger generations (WHP 2008f, pg. 3-6).

To help stop the loss of language, cross-cultural and cross-generational mentoring will help tribal members share their cultural experience and knowledge. The Chapter needs to promote the preservation of the Navajo language by encouraging bilingual education and conversation. The Chapter also needs to encourage Ké, Navajo common law, which is a gesture of Navajos respecting one another and placing Navajo customs and beliefs above government rules (WHP 2008f, pg. 3-6).

To improve workforce development, the Chapter could provide cardiopulmonary resuscitation (CPR) and food handler training, which are essential to the hospitality industry. Scenic views and the close proximity to the Grand Canyon provide the Kaibeto Chapter with potential for growth in the hospitality service industry (WHP 2008f, pg. 3-6).

Satellite continuing education courses from nearby vocational schools could further provide training for the local workforce. In addition, this vocational training could be incorporated into the local high school curriculum to provide the Chapter's youth with the skills necessary for holding quality jobs on the reservation (WHP 2008f, pg. 3-6).

Possibly the most important part of enhancing the workforce and maintaining qualified employees in the Chapter is to provide competitive salaries. It is not uncommon for Navajo Nation residents to seek higher-paying employment in nearby off-reservation communities. Seeking private grants or establishing relationships with private funders may provide the resources for recruitment efforts that include a guaranteed salary or scholarships in exchange for a commitment of particular years of service within the community (WHP 2008f, pg. 3-7).

For improved infrastructure, the Chapter could purchase a road grader for dirt roads. Culverts need to be installed and regularly cleared of silt and debris in places where the roadway commonly washes out. Main roads such as the road that connects to Coppermine Road should be paved. The Chapter also needs to plan for road infrastructure in the Chapter. Roads to individual homes need to be upgraded in order to improve access and prevent unnecessary soil erosion, particularly to and from remote homes. Farm and highway fencing will keep livestock out of harm's way and away from environmentally sensitive areas (WHP 2008f, pg. 3-7).

Windmills for livestock are also needed to help ranchers with a reliable source of water for livestock. Wells and water storage tanks are needed to provide a tested and clean water supply for remote houses that have to haul water (WHP 2008f, pg. 3-7).

The Chapter has expressed an interest in the use of solar infrastructure. Off-the-grid infrastructure like solar power can be used to provide utilities to scattered home sites that are far away from municipal infrastructure (WHP 2008f, pg. 3-7).

Empowering local governance within the Chapter was identified as a priority in the community workshops. The Chapter needs to hire personnel to support local government. The Chapter desires to hire Chapter members to staff new Chapter government positions. In order to begin hiring for these positions,

the Chapters needs to develop job descriptions for both a Community Services Coordinator and all other Chapter positions. Ongoing training in leadership, financial management, public financial management, public service, and project management will build community development and local governance at the Chapter level (WHP 2008f, pg. 3-7).

The Chapter also wishes to acquire Local Governance Act (LGA) certification. LGA certification recognizes governance at the local level by granting local authority over local matters. After updating and adopting this CLUP 2008, the Chapter must continue training in financial management as the next step in certification (WHP 2008f, pg. 3-7).

Forming a central contact person will help the Chapter reach its vision and obtain leadership commitment and support for FBFA priorities. This central contact person will help establish cooperative and collaborative relationships and help Chapter members ensure that the FBFA projects get completed (WHP 2008f, pg. 3-8).

A policy for helping displaced residents return after the former Bennett Freeze needs to be established. An orderly process for obtaining home site leases needs to be created to help residents acquire a home in a timely manner. Utilities and other infrastructure need to be improved for residents returning to the FBFA. Counseling and support services for FBFA victims also needs to be provided. The Chapter should continue to work with the FBFA Task Force and Design and Engineering Services to establish fair policies and procedures and ensure the delivery of services and infrastructure to FBFA residents (WHP 2008f, pg. 3-8).

5.16 Kaibeto Chapter Community Needs

Community Resource Needs were identified and divided into the following areas:

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

5.16.1 Infrastructure

Infrastructure within the community needs improvement. Chapter lands within the former Bennett Freeze boundary are most in need of repair because funding for improvements was frozen for over 40 years. The Chapter has noted a need to improve the water and electricity infrastructure in the FBFA (WHP 2008f, pg. 3-9).

Currently the Chapter is working on the main power lines to homes in the FBFA, but the means of connecting each individual home to the power system has not been worked out. New sewer lagoons will have to be constructed for new clustered residential developments (WHP 2008f, pg. 3-9).

Some rural Chapter members do not have cell phone service or other telecommunications service to their homes. People have to drive to locations where cell phone service is available in order to make a phone call, a major inconvenience and huge safety issue in emergencies, as it adds time to emergency response. In addition to spotty cellular communications, Internet access is also sparse but could be provided easily in designated areas with wireless service (WHP 2008f, pg. 3-10).

5.16.2 Transportation

Poor road conditions are common throughout the Kaibeto Chapter. According to Chapter members who attended the planning workshops, many roads are washed out after storms or when snowmelt crosses the road. The road that connects with Coppermine Road is heavily traveled but unpaved (WHP 2008f, pg. 3-11).

In order to maintain better roads in the Chapter, it could purchase a road grader to maintain dirt roads. Culverts need to be installed and regularly cleared of buildup in places where the roadway commonly washes out. Roads to individual homes need to be improved in order to improve access and prevent unnecessary soil erosion (WHP 2008f, pg. 3-11).

During the workshops, Chapter members identified a need for an airstrip in the Chapter. Land has not been withdrawn, nor has a site been selected. Funds need to be set aside to study the feasibility of this airstrip (WHP 2008f, pg. 3-11).

5.16.3 Housing

At the planning workshops, participants identified the top need as housing, particularly in the FBFA. The Chapter members desire new homes constructed of long-lasting materials (WHP 2008f, pg. 3-11).

A diversity of housing types is needed within the Kaibeto Chapter. Elderly group homes are needed to house the aging population. In the past, many newly constructed homes were provided to elders, leaving young families still in need of housing. Clustered housing should be located in a central location, near municipal utilities, and other community amenities. There is also a need for mobile home sites, which are ideal for residents who do not have time to acquire a home site lease or might want to move elsewhere in the future (WHP 2008f, pg. 3-11).

The planning team analyzed the housing needs mentioned above and made a professional judgment about which projects will have the strongest benefits at the chapter level. Some projects mentioned above would benefit the entire region and are best funded at the regional level (WHP 2008f, pg. 3-11).

5.16.4 Health and Public Safety

Response time to emergencies throughout the Chapter is too long to assure public safety (WHP 2008f, pg. 3-12).

Chapter members have expressed a need for a police substation within the FBFA of the Chapter. The nearest emergency health facilities are in Page and Tuba City. A quick-responding helicopter medical emergency response unit is needed to provide expedited response to medical emergencies. Many homes within the Chapter do not have physical addresses. These homes need to be addressed in order to help emergency personnel locate a site (WHP 2008f, pg. 3-12).

As of 2008, the Navajo Nation has been working on a rural system for 911 emergency response. This project will map and assign an address to all homes in the Chapter (WHP 2008f, pg. 3-12).

Chapter members expressed a need for a local trauma center within the Kaibeto town site and a second satellite health clinic in the FBFA. A care center for the aging population is also needed (WHP 2008f, pg. 3-12).

The planning team analyzed the public safety and health needs mentioned above and made a professional judgment about which projects will have the strongest benefits at the Chapter level. Some projects mentioned above would benefit the entire region and are best funded at the regional level (WHP 2008f, pg. 3-12).

5.16.5 Community Facilities, Parks, and Recreation Needs

Community facilities and services are an important part of the community vision. A senior citizens center is needed for the aging population in the Chapter, and a daycare is needed for children younger than pre-school age. A multipurpose community center will provide a place for community members to congregate for recreational activities or community members. Kaibeto also needs a cemetery within the Chapter (WHP 2008f, pg. 3-13).

Community recreation facilities will also be an important element in improving the quality of life for people in the FBFA. Community facilities provide a place for youth and adults alike to congregate. A skate park for teenagers and playground equipment for younger children are desired by the Chapter for youth. A Boys and Girls club would also provide activities for the Chapter youth. Chapter members also desire a recreation center, firing range, and improved and relocated rodeo grounds. These facilities will provide entertainment for Chapter members of all ages, as well as regional economic development opportunities as an activity center (WHP 2008f, pg. 3-13).

5.16.6 Economic Development

The Chapter needs an affordable grocery store and a self-service laundry service at the Kaibeto town site. Currently, Chapter members have to drive to either Page or Tuba City to get to the nearest grocery store and laundry service, which means spending more time in their automobiles and more money on fuel. A community store will provide jobs within the community and sell basic items for Chapter members and tourists (WHP 2008f, pg. 3-14).

The Chapter wishes to hire staff to provide additional chapter services and support ongoing planning efforts. Expanded office space and office equipment within the Chapter House is needed for any additional staff (WHP 2008f, pg. 3-14).

Many Chapter members make a living by selling Navajo arts and jewelry. Currently, vendors set up along State Road 98. There is not adequate right-of-way to provide a safe distance from moving traffic. The Chapter needs to designate a vending area removed from the right of way and withdraw land for this vendor village (WHP 2008f, pg. 3-14).

The Chapter has withdrawn several sites for economic development. A planning effort needs to be coordinated to make sure that these sites are successfully developed and are beneficial to the community (WHP 2008f, pg. 3-14).

5.16.7 Education

The Chapter wishes to improved education. Although there are numerous education opportunities for the school-age population, there are no educational services for adults and the population younger than kindergarten age. Adult and continuing education services are far from the community (WHP 2008f, pg. 3-14). There are no pre-schools or childcare facilities near Kaibeto. The lack of facilities for the younger population can make finding childcare difficult for working families with young children (WHP 2008f, pg. 3-15).

The Chapter needs to secure funding for continuing education programs and pre-school programs. An educational needs assessment needs to be conducted in order to justify new schools within the Chapter. Suitable sites need to be identified and withdrawn for any new facility. The Chapter will have to coordinate with other government agencies to secure funding for new educational facilities and programs (WHP 2008f, pg. 3-15).

5.16.8 Open Space, "Areas of Avoidance," and Grazing Needs

Raising grazing animals is a way of life for people in the Chapter. Much of the land within the Chapter is leased to grazing-permit holders. Over time, poor range management has caused problems on grazing land. There is not a ranger station near the Chapter to patrol grazing land. Grazing animals have been reported to be stolen, and some permit holders have exceeded limits of livestock numbers. The Chapter needs to provide grazing areas that can be easily watched (WHP 2008f, pg. 3-15).

Poor range management has also resulted from the lack of land conservation programs and education. Much of the grazing land is not fenced, thus allowing grazing animals near homes, agriculture sites, and environmentally sensitive areas such as steep slopes. Range management education, increased range enforcement, and fencing are needed in order to allow grazing to continue within the Kaibeto Chapter (WHP 2008f, pg. 3-15).

Agriculture and farming are also important to the way of life for the people of the Kaibeto Chapter. In order to perpetuate the type of farming traditional to the Navajo, Chapter members could cultivate small farms to produce food for Chapter members (WHP 2008f, pg. 3-15). This type of community-based agriculture would help preserve the way of life for Chapter members, stimulate commerce within the Chapter, and enhance the sustainability of the community (WHP 2008f, pg. 3-16).

The desert landscape home to the Kaibeto Chapter is delicate. The Chapter needs to create programs to protect water quality, wildlife, and minerals in the area. During the community workshops, participants identified several "areas of avoidance". These areas need to be inventoried and perhaps mapped. If necessary, these sites should be fenced in order to keep grazing animals away from sites that could be damaged, and regularly patrolled to protect against vandalism and unsanctioned poaching (WHP 2008f, pg. 3-16).

5.17 Kaibeto Chapter Priority Capital Improvement Projects

These needs are fully outlined in the 2008 Kaibeto CLUP (WHP 2008f). Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top projects the residents would like to see occur first include a power line to FBFA (including connection to individual homes), a paved road to connect w/Coppermine Road, individual home sites and houses in FBFA, a communication tower, a police substation in FBFA, windmills for livestock, local ranger station, and a multipurpose center near Kaibeto Market, Kai'bii'to Land Site (WHP 2008f, pg. 3-17).

5.17.1 Kaibeto Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008f, pg. 3-18).

5.17.2 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008f, pg. 3-18):

- Feed Store
- Clinic (Kaibeto area)
- Cellular tower
- Paved road to connect with Coppermine
- Roads to individual homes

5.17.3 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008f, pg. 3-18):

- Public safety complex
- Multipurpose Center (near Kaibeto Market, Kai'bii'to Land Site)
- Clustered housing

5.17.4 Phase 3 Projects: 10-15 Years

The following represents the project identified by one small group as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008f, pg. 3-18):

- Bottling company
- Beef and sheep shipping

5.18 Preferred Development Sites

The Chapter identified several areas as ideal locations for future development. Most of these potential development sites are located along US Highway 89 and US Highway 160 (WHP 2008f, pg. 4-20). Several potential development sites were identified at locations away from the business centers. These include locations suitable for wind power generation, agricultural development, and home based businesses. Agricultural projects are geared to on-site improvements, such as earthen dams to create livestock ponds, moveable and permanent fencing, and pasture improvements. These projects are dispersed throughout the Chapter and would benefit individual sites. The appropriate project might be designed as a program of technical and financial assistance (WHP 2008f, pg. 4-20).

6. Leupp Chapter

Leupp Chapter is located in north central Arizona in the southwestern corner of the Navajo Nation and in the eastern portion of Coconino County. The Chapter is about 295,876 acres and includes 38,029 acres within the FBFA. Thirteen percent of the Chapter is located within the FBFA (WHP 2008g, pg. 1-5).

The Birdsprings Chapter is located to the east of Leupp, Tolani Chapter to the northeast, and Cameron Chapter to the north. Wapatki National Park is adjacent to the west boundary, as is the Coconino National Forest (WHP 2008g, pg. 2-35).

6.1 Leupp Chapter Physical Setting

Several topographic features outline the landscape surrounding the Chapter. Newberry Mesa rises 300 feet above the Painted Desert. Just north of Newberry Mesa are Pottery Hill, Lii Haaditiih Hill, and Ward Terrace. Tloi Lechii Cliff and Dry Spring Well are just two miles west of Lii Hadditiih Hill (WHP 2008g, pg. 2-37).

The Little Colorado River comes in from the southeast and traverses the community to the northwest, bringing numerous features to the landscape such as Grand Falls, Dennebito Wash, Box Springs, and Stone House Wash. The region between the Little Colorado River and Newberry Mesa is flat (WHP 2008g, pg. 2-37).

From southwest of the Chapter, Canyon Diablo winds through the valley and intersects the Little Colorado River at Leupp. San Francisco Wash, Young‘s Canyon, and Padre Canyon are just northwest of Canyon Diablo, and Yellow Jacket Canyon is to the southwest. Overall elevations in the Chapter range between 4,700 and 5,600 feet above mean sea level (WHP 2008g, pg. 2-37).

6.2 Leupp Chapter Land Status

The Chapter is comprised of trust land with no private holdings. The northern portion of Leupp Chapter is located in the FBFA (WHP 2008g, pg. 2-35). Other than the area within the FBFA, the Leupp CLUP does not contain any information regarding land disputes within its border.

6.3 Leupp Chapter Land Use

The majority of the Chapter’s land is used for grazing cattle and sheep. Leupp is located within Grazing District 5 and Sub-Unit 3 (WHP 2008g, pg. 2-36).

Ranger stations to patrol grazing land within the Chapter are located at a distance of at least 125 miles away, in Chinle and Shiprock. The lack of ranger stations within the Chapter means that there is insufficient range enforcement within the Chapter. Many people with grazing leases fear that their livestock will be stolen due to these deficiencies (WHP 2008g, pg. 2-36).

There is a lack of range and livestock preservation programs in the Chapter. The lack of these programs has resulted in poor range and livestock management on behalf of grazing leaseholders. This has resulted in overgrazing, which causes increased soil erosion and inadequate vegetation for livestock. In addition, most grazing areas are not identified or fenced. This can result in loose cattle that damage cultural sites, invade homesites, and cause irreversible damage to environmentally sensitive areas such as steep slopes and riparian corridors (WHP 2008g, pg. 2-36).

Every year during the first part of October, the Leupp Cattle Growers Association holds a livestock auction for Navajo ranchers. The auction attracts state buyers and provides positive economic stimulus for Navajo ranchers. However, there are not enough corrals or bullpens to hold all the animals during the auction or in other times of the year (WHP 2008g, pg. 2-36).

Due to drought conditions, water is limited, especially when determining how much water should be allocated to animals. Earthen dams and windmills are built to supply water to animals, but there are not enough of them to supply water to all animals adequately (WHP 2008g, pg. 2-37).

6.4 Leupp Chapter Population and Housing

The 2010 US Census lists the Chapter population as 1,611 individuals. The Chapter has one community where most tribal members reside, Leupp.

There are 1,605 housing units found in the Chapter, and seventy-two percent of the homes are occupied (WHP 2008g, pg. 2-8). A little over a quarter (28 percent) of the homes are vacant. The Chapter has a higher rate of detached homes than the Navajo Nation at seventy-four percent (WHP 2008g, pg. 2-8).

A substantial number of homes are located in the town of Leupp. Housing units in the town of Leupp are distributed across five housing tracts, one trailer park, and a few scattered homesites. The housing tracts are withdrawn areas held by the BIA or the NHA. The trailer park is privately owned, and the scattered homesite leases are held by private individuals (WHP 2008g, pg. 2-10).

Many of the homes in the Chapter are of poor construction quality, and many in the FBFA have become very run-down due to the restrictions on improvements. According to field data conducted by WHPacific in 2008, nineteen percent of homes in the Chapter are in poor to very poor condition (WHP 2008g, pg. 2-10).

6.5 Leupp Chapter Government and Utility Infrastructure

The Chapter provides services to Chapter members and the surrounding region through the administration of tribal, county, state, and federal programs. Programs are housed in different community facilities, but primarily in Leupp Community Center (LCC), which is located in the town of Leupp. The LCC is situated on 100 acres of tribally withdrawn land designated as an industrial park. Other programs are housed in several other Chapter buildings, office trailers, and warehouses located on 25 acres of tribally withdrawn land (WHP 2008g, pg. 2-19).

The Youth Center is open to the general public at no charge and contains a fitness center and computer lab. The fitness center has free weights, a treadmill, stationary bikes, and a variety of leg machines. The computer lab has a scanner, Internet access, word processing, children's programs, and art software; however, there is a higher demand for computers than there are computers available. The Youth Center also houses two youth programs. The Youth Opportunity Program is open to individuals between the ages of 14 and 21. The Office of Diné Youth (ODY) program is for two separate age groups, 14 and under, and 21 to-25 (WHP 2008g, pg. 2-19).

The Navajo Nation's Southwest Regional Office of the Department of Social Services and the Youth Program are housed in the same facility. The Department provides the following services: Adult In-Home Care, 638 Welfare Assistance, Child Protective Services, Family Preservation Service-Arizona Title 20, the Leupp Youth Home, and Childcare (WHP 2008g, pg. 2-20).

The Leupp Youth Home serves male adolescents, ages 13-17 years, who need home supervision and home living skills in a strict home life environment. The Leupp Youth Home has a capacity of six attendees and serves the entire Navajo Nation (WHP 2008g, pg. 2-20).

Other programs within the Chapter provide the following community services: Food Distribution, Department of Workforce Development, the Elderly Center, Leupp Fire Department, Capital Improvement Projects (CIP), and childcare, Head Start, Public Employment Program (PEP), housing construction, Community Health Representative Program, and renovation assistance (WHP 2008 g, pg. 2-20).

The Flagstaff Unified School District (FUSD) administers the public school system. FUSD buses Chapter students to Coconino High School, Flagstaff High School, and Sinaugua High School, which are all located in Flagstaff, Arizona (WHP 2008g, pg. 2-14).

The Leupp Elementary School provides a general education curriculum from preschool through eighth grade (WHP 2008g, pg. 2-14).

The BIA Office of Indian Education offers Native American Tribes the option of running their own school. The former Leupp Boarding School chose this option and incorporated under Leupp School, Inc. Leupp School, Inc. provides a general education curriculum from kindergarten through 12th grade. A dormitory is also available (WHP 2008g, pg. 2-14).

The Navajo Nation operates the Chapter's Head Start programs. Head Start is a preschool program for students between three and five years old (WHP 2008g, pg. 2-14).

NTUA provides electric service to approximately 323 customers in Leupp. Power lines extend along Navajo Roads 15 and 2, and Highway 99. Outlying areas do not have electricity. NTUA also provides streetlights to approximately 119 customers within the town of Leupp (WHP 2008g, pg. 2-53).

Navajo Tribal Utility Authority provides water to approximately 171 customers residing in the Chapter. The water is from a system in the town of Leupp that extends north along the road to the Hopi Reservation. Two booster stations and three wells supply water to the system. The NTUA manages the

chlorine and adjusts the fluoride level. The existing water storage tanks are inadequate for the growing number of users. A 40,000-gallon tank is needed to properly serve all water users (WHP 2008g, pg. 2-53).

The Water Development Program is located inside the Chapter's 100-acre industrial park. Services include maintenance of windmills and water wells throughout the Western Navajo Agency (WHP 2008g, pg. 2-53).

NTUA maintains a two-cell sewer lagoon located north of the town of Leupp. NTUA wastewater service extends only to 132 customers in the town of Leupp. The lagoons produce unpleasant smells, and high winds pick up sediments and scatter them throughout the town of Leupp; a wastewater plant would solve this spread of sediments. Septic systems are used where wastewater service is not available (WHP 2008g, pg. 2-58).

According to field data conducted by WHPacific in 2008, thirteen percent of homes surveyed where connected to septic systems. Septic systems for residences are typically installed by IHS and turned over to the homeowner for maintenance and service (WHP 2008g, pg. 2-58).

Sanitary services are provided by public and private entities from surrounding towns. Coconino County provides solid waste collection through a transfer station, which is located in the Chapter's industrial park (WHP 2008g, pg. 2-58).

According to field data conducted by WHPacific in 2008, fifty-nine percent of homes surveyed in the Chapter are connected to public wastewater system, and twenty-eight percent are dependent on an outhouse (WHP 2008g, pg. 2-58).

NTUA provides natural gas service to approximately 193 customers (24% of Chapter residents) in the town of Leupp. Natural gas service is provided from an El Paso Natural Gas Company (EPNG) transmission system. EPNG, an interstate natural gas transmission pipeline company, has two underground pipelines located in a 100-foot right-of-way running parallel to Navajo Road 15 in an east-west direction. It also has a compression station located approximately three miles west of the Chapter House (WHP 2008g, pg. 2-60).

Transwestern Pipeline Company is also an interstate natural gas transmission pipeline company. They have two underground pipelines located in a 100-foot right-of-way running parallel to Navajo Road 15 in an east-west direction. Any crossings of EPNG or Transwestern Pipeline rights-of-way require prior notification and adherence to their company design standards. They will not allow any type of joint use of their right-of-ways such as roads or bike trails (WHP 2008g, pg. 2-60).

Propane is also widely used throughout the Chapter. Propane distributors are available in nearby towns (WHP 2008g, pg. 2-60). Fifty-seven percent of Chapter residents heat with wood (WHP 2008g, pg. 2-9).

The majority of Chapter members (64 percent) do not have telephone service available (WHP 2008g, pg. 2-10). Frontier Communications, based out of St. Michaels, Arizona, provides telephone service to customers in Leupp. Service is limited to areas within the town of Leupp and areas paralleling Navajo Road 15. The service area needs to be expanded to include more customers and households (WHP 2008g, pg. 2-62).

A Cellular One cellular tower is located on Navajo Road 15, approximately four miles west of the town of Leupp. This cellular tower is not enough to provide reliable and adequate phone service to all residents in the Chapter (WHP 2008g, pg. 2-62).

6.6 Leupp Chapter Environmental Safety Status

A groundwater test of the Dry Spring Well located in Box Canyon in the northern part of the Chapter indicated the presence of uranium in the water source. The uranium concentration level in the Dry Spring Well categorized this well as posing some cancer risk. More recent test results conducted by El Paso Natural Gas Company of seven wells located near the compressor station indicated the presence of chromium in the groundwater (WHP 2008g, pg. 2-55).

6.7 Leupp Chapter Water

6.7.1 Surface Water

Leupp lies within several watersheds within the Little Colorado River Basin, which is part of the larger Colorado River watershed basin. The area is drained to the northwest by the Little Colorado River, which is a tributary of the Colorado River (it is approximately 315 miles long). It rises in eastern Arizona and flows northwest, through a series of deep gorges, past the town of Leupp. It joins the Colorado River in the Grand Canyon, approximately 70 miles north of Flagstaff (WHP 2008g, pg. 2-39).

Dennebito Wash and Oraibi Wash drain the southwestern escarpment of Black Mesa. Flows from these washes drain to the Little Colorado River. Both washes flow only during periods of heavy rainfall or snow-melt, and runoff is very sporadic (WHP 2008g, pg. 2-39).

Canyon Diablo flows into the Little Colorado River from the southwest. Flows from San Francisco Wash, Young‘s Canyon, Padre Canyon, Babbitt Wash, and Yellow Jacket Canyon drain to Canyon Diablo and eventually join the Little Colorado River. Other smaller tributaries flow to the Little Colorado River; however, the water is lost by evaporation or reinfiltrates before the flow reaches the Little Colorado River. Many of these tributaries are unnamed (WHP 2008g, pg. 2-39).

6.7.2 Ground Water

Leupp is in the Little Colorado River Basin where water-bearing rocks consist primarily of sandstone, limestone, and other conglomerate. Though several aquifer systems underlie the Little Colorado River Basin, the Coconino aquifer is underneath the Leupp area. The Coconino aquifer is a multiple-aquifer system that encompasses several lithologic formations. The Coconino Sandstone is the principal lithologic unit of the Coconino aquifer. Other important water-bearing rock units include the Kaibab Formation and the Upper Supai Formation. The aquifer underlies the entire surface-water drainage of the Little Colorado River and is the most extensive and productive aquifer in the basin (WHP 2008g, pg. 2-41).

The areal extent of this aquifer is more than 27,000 square miles. The U.S. Geological Survey identified more than 1,000 wells and springs in Arizona and New Mexico. Groundwater development has increased steadily since the 1940s due to population growth and its demand for agricultural, industrial, and public water supplies. Groundwater pumping during the year of 1995 was about 140,000 acre-feet (WHP 2008g, pg. 2-41).

Groundwater movement in the aquifer is generally to the northwest. The aquifer is recharged from precipitation that infiltrates through fractured exposures of Permian and Pennsylvania rocks that occur primarily along the western and southern edges of the Little Colorado River Basin. Recharge also occurs in the northeastern part of the Little Colorado River Basin on the Defiance Uplift. Less significant recharge occurs through unconsolidated alluvium along the Little Colorado River and some of its tributaries. In addition to the aquifer, shallow groundwater occurs in alluvial sediments along streams and in volcanic rocks (WHP 2008g, pg. 2-41).

6.7.3 Wetlands and Floodplains

There are recorded wetlands within the Chapter, primarily associated with The Little Colorado River. Wetland area types located within the Chapter include riverine, freshwater forested/shrub, freshwater emergent, and freshwater ponds (USFWS 2016).

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas surrounding Leupp, Arizona, dated September 3, 2010, showed no flood prone areas (FEMA 2016).

6.7.4 Water Rights

Water rights are only mentioned in the CLUP at a regional level, not as a Chapter level project (WHP 2008g, pg. 4-21).

6.7.5 Chapter Water Needs

According to field data conducted by WHPacific in 2008, fifty-nine percent of homes surveyed in the Chapter are connected to public wastewater system, and twenty-eight percent are dependent on an outhouse (WHP 2008g, pg. 2-58).

6.8 Leupp Agricultural Resources

6.8.1 Community Farmers

Below are descriptions of two farms that exist in the Chapter. Though the farms have done well in the past, due to drought conditions and lack of resources farming has ceased or slowed. If resources were

provided, farming could continue to be developed and fields would be farmed and cultivated. In addition, if Dinnebeto Wash were connected to irrigation, then this area could be farmed (WHP 2008g, pg. 2-36).

6.8.1.1 Leupp Farm

The Leupp Farm was established in 1985, approximately two miles north of the town of Leupp. It utilizes a total of 96.5 acres to grow alfalfa (WHP 2008g, pg. 2-35). The farm's minimum rate production for bales was 85 bales per acre, and the maximum was 650 bales per acre (this rate has been achieved sporadically and with two cuts). In 2002, the generator broke and farm production ceased. It is estimated to cost $27,000 to replace the generator (WHP 2008g, pg. 2-37).

The farm has a well, which is approximately 175 feet deep and produces 600 gallons per minute of quality water. The fence surrounding the farm is in good condition. Access to the farm is via Navajo Road 6732, which is unpaved (WHP 2008g, pg. 2-37).

6.8.1.2 Beaver Farm

Beaver Farm is located northwest on the south side of the Little Colorado River. Beaver Farm was established on an 80-acre tract. Roads leading to Beaver Farm are unidentified and unpaved (WHP 2008g, pg. 2-37).

6.9 Leupp Soils

Two primary soil categories occur within the Leupp Chapter boundaries. These include mesic arid soils and mesic semiarid soils. The area immediately surrounding the town site of Leupp are mesic arid soils held within the Moenkopie-Shalet-Tours Association to the west and the Tours-Navajo Association to the east (WHP 2008g, pg. 2-42).

The Moenkopie-Shalet Tours Association runs in a northwest-southeast band through the Chapter and consists of well-drained soils on plateaus and flood plains. The soils formed in residuum and alluvium weathered from sandstone, shale, and conglomerate rocks. Moenkopie soils make up about 60 percent of the association, Shalet soils 15 percent, Tours soils 15 percent, and minor areas of associated soils, 10 percent. The minor soils are mostly small areas of Ives, Jocity, Trail, Clovis, Palma, Claysprings, and Purgatory series. Also included are small areas of sandstone rock outcrop. Moenkopie and Shalet soils have low potential for forage production. Tours soils that receive extra water from runoff have fair-to-good potential under good management to produce forage. Factors limiting the potential of these soils for homesite development are the shallow depths to rock in the Moenkopie and Shalet soils. Also, the Tours soils may be subject to flooding and have moderately slow permeability, which is poor for use as septic tank absorption fields (WHP 2008g, pg. 2-42).

The Tours-Navajo Association enters the Chapter from the southeast and fits snugly against the Moenkopie-Shalet-Tours Association to its west and to the southern extents of the Badland-Torriorhents-Torrifluvents (MA1) and the Sheppard-Fruitland-Rock Outcrop Associations. This association consists of well-drained soils on the flood plains and adjacent low alluvial fans of the Little Colorado River and its major tributaries. The soils formed in recent alluvium derived from sedimentary and volcanic rocks.

Tours soils make up about 35 percent of the association, Navajo soils 35 percent, and minor areas of associated soils and riverwash about 30 percent. The minor soils are mostly Ives, Trail, and Jocity. The soils have fair potential under good management for producing livestock forage. Limited precipitation is the major factor, but these soils receive runoff from adjacent areas during wet periods. Riparian vegetation and adjacent irrigated cropland provide elements for good wildlife habitat in this association. The short growing season limits crops grown in irrigated areas to alfalfa, corn, small grain, and pasture grasses. Saline areas require careful management and reclamation practices. Factors limiting the potential of these areas for homesites and community uses are flooding hazard, moderately slow to very slow permeability, low bearing strength, salinity, erosion hazard, and potential frost action (WHP 2008g, pg. 2-42).

Additional soils to the north of Leupp's townsite include Badland-Torriorhents-Torrifluvents, the Sheppard-Fruitland-Rock Outcrop Associations, the Fruitland-Camborthids-Torrifluvents Association, and a small pocket of Tours-Navajo Association. West of the town site in the southwest corner region of the Chapter, the soils are mesic semiarid. The corresponding associations are the Winona-Boysag-Rock Outcrop Association and the Rudd-Bandera-Cabezon Association (WHP 2008g, pg. 2-42).

6.10 Leupp Biological Resources

6.10.1 Threatened and Endangered Species and Resource Protection Zones

Portions of the Chapter contain some sections classified by NNDFW as Resource Protection Zone 1, a highly-sensitive wildlife resource area. Within the Chapter, the following areas classified as RPZ 1: the Little Colorado River, Grand Falls, Canyon Diablo, and Tloi Lechii Cliffs (WHP 2008g, pg. 2-45).

The Little Colorado River is protected with a buffer zone from thick riparian vegetation to protect the yellow-billed cuckoo and southwestern willow flycatcher. Grand Falls is within the Little Colorado River protected area. Canyon Diablo is also protected with a buffer to protect golden eagles, peregrine falcon, mule deer, antelope, and elk (WHP 2008g, pg. 2-45).

The following areas of the Chapter are classified as RPZ 2; Sunrise to Old Leupp and Newberry Mesa (WHP 2008g, pg. 2-45).

The remainder of the Chapter is classified as RPZ 3, low sensitivity (WHP 2008g, pg. 2-46).

6.11 Leupp Mineral Resources

6.11.1 Minerals

There are at least four inactive gravel borrow pits within the Leupp area. These borrow pits were developed by the BIA for local road construction projects. The most active site is located approximately one mile north near the Chee family residence (WHP 2008g, pg. 2-37).

6.12 Leupp Cultural and Traditional Resources

6.12.1 Cultural Resources

The NNHHPD has inventoried and mapped the locations of several archeological sites and previous project locations, but the entire chapter has not been inventoried. NNHHPD does not reveal the locations of sensitive cultural sites due to the potential for vandalism, robbery, and the need to protect privacy. Hence the specific locations of cultural sites are not identified on maps.

The Chapter has also identified AOA, as previously discussed in the Leupp Land Use section. The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use.

While these areas are well-known by many elders and traditional Navajo residents, the younger generation does not necessarily share this knowledge and understanding. There is currently a lively debate about whether these special areas should be mapped or not. Proponents say that mapping helps preserve and pass on this important cultural and spiritual knowledge across generations and into the future; opponents say this information should be passed orally and personally from generation to generation. In either case, it is important for the Chapter to establish a policy and procedure for how to assure that lands planned for development are not areas to avoid. The Navajo Historic Preservation office does have maps of some of these areas, which it can check site by site as project proposals move forward for development (WHP 2008g, pg. 2-39).

Recently, the Chapter has noticed activities that threaten culturally sensitive areas and fragile environments. Four-wheelers have been driving uninhibited through Chapter lands, and tourists have been removing artifacts from Chapter land. These types of activities can do irreversible damage to culturally significant areas and environmentally sensitive areas and must be addressed in order to prevent them in the future (WHP 2008g, pg. 2-40).

6.13 Leupp Chapter Community Needs Assessment

The community needs assessment is based on information provided from the community workshops in 2008 that were hosted by WHPacific, Inc., comments provided by the community, and professional field assessments completed by WHPacific, Inc. in the summer of 2008 (WHP 2008g).

The community needs assessment includes Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

6.13.1 Leupp Development Vision

The Chapter vision captures how Chapter members would like to see their community grow over the next 15 years. In the long-term, Chapter members want to maximize the benefits of modern opportunities, but at the same time maintain the integrity of traditional Navajo culture. Chapter residents want to preserve their rural atmosphere, but bring in modern amenities such as telephones, electricity, and plumbing to all residents who desire them (WHP 2008g, pg. 3-1).

6.14 Leupp Development Goals

During the community workshops held during Summer 2008, community members outlined goals for the Chapter that would aid in reaching this vision. These goals include community policies, capital projects, and community service (WHP 2008g, pg. 3-1).

Community facilities and service are an important part of the community vision. The Chapter wishes to improve education, including expanding educational facilities for the Chapter's youth. A multi-purpose community center will provide a place for community members to congregate for recreational activities or community meetings. A community store will provide jobs and basic necessities for Chapter members and tourists (WHP 2008g, pg. 3-1). The Chapter wishes to hire staff to provide additional chapter services and provide ongoing planning efforts in an expanded office space with updated office equipment (WHP 2008g, pg. 3-1).

Infrastructure within the community will be improved, particularly within the FBFA, to provide water and electricity to all residents. Solid waste will be collected safely and reliably at a Chapter transfer station. Improved cellular communications infrastructure will improve quality of life and safety for all residents (WHP 2008g, pg. 3-1).

Because of the high cost of providing municipal infrastructure to remote houses in the chapter, solar power with wind-powered back-up generators will be used to provide electricity to scattered rural homes. Rural homes will also have improved access to safe drinking water sources if the cost of connecting them to municipal services is too high. The Chapter will provide educational and training opportunities for residents and entrepreneurs to learn how to maintain these off-the-grid utilities (WHP 2008g, pg. 3-2).

Community facilities like a multipurpose center, schools, and an adult education center will provide computers and Internet access to support the curiosity, learning, and communication needs of all residents (WHP 2008g, pg. 3-2).

Economic development will improve quality of life for the Chapter and retail and recreational opportunities for tourists. Ranchers will have nearby water resources for livestock. Chapter vendors will be able to sell Navajo arts and jewelry to tourists. Affordable groceries will be available at a store within the Chapter (WHP 2008g, pg. 3-2).

Chapter residents will have a full range of education opportunities from school age through adulthood, including childcare, job training, leadership cultivation, culture and language sharing, and personal and business finance management (WHP 2008g, pg. 3-2).

The road system will be improved and maintained to be safe and efficient in all weather conditions and seasons (WHP 2008g, pg. 3-2).

Community facilities and parks will provide places for Chapter members to congregate. The existing rodeo facility is in poor condition and is not located on a main road. An improved and accessible rodeo ground will attract tourists and bring together residents of all ages (WHP 2008g, pg. 3-2).

Nearby emergency health, fire, and police facilities and substations will provide a quick response to medical and safety emergencies. Helicopter service to Tuba City can respond to major emergencies. All homes will be addressed for emergency response and within range of reliable cell phone service (WHP 2008g, pg. 3-2).

Ranching and raising grazing animals continues to be a rich and viable way of life in this part of the Navajo Nation (WHP 2008g, pg. 3-2). A nearby ranger station will help to manage rangelands prevent criminal activities such as theft of livestock. Range management education programs will help preserve the quality of the land and maintain this means of subsistence (WHP 2008g, pg. 3-2).

All residents who wish to live in Leupp will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members will be able to live in scattered home sites if they are grazers who prefer to live a subsistence lifestyle or clustered housing developments if they prefer the amenities and infrastructure of a modern community. Mobile home parks and rental houses will be available for people who may need to move from the Chapter in the future or for people who are in immediate need of a home. Elderly living facilities will allow independence while also providing assistance with preparing food, social opportunities, and medical care (WHP 2008g, pg. 3-2).

6.15 Guiding Development Principles

Chapter members outlined principles that should be used to guide development and protect culturally and environmentally sensitive land over the next 15 years (WHP 2008g, pg. 3-5).

It is important for the Chapter to provide for people's basic needs such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service need to be improved to better respond to emergency situations (WHP 2008g, pg. 3-5).

Sustainable construction should be required for all new buildings. These buildings should be energy-efficient and designed to last many generations. Structures should be designed to work with the land in order to provide passive solar energy to further reduce energy costs. These structures should provide optimal protection from the elements with high-quality insulation to better regulate indoor temperatures and raised floors to protect against flooding (WHP 2008g, pg. 3-5).

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the

Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community (WHP 2008g, pg. 3-5).

The Chapter needs to protect and provide scattered housing as an option for remote areas and ranchers. Fencing around homes and cornfields will help keep cattle away from property that is easily damaged. Grazing areas should be located where cattle can be easily watched. Grazing should be protected as an ongoing way of life for people in the Chapter. The Chapter must educate grazing-permit holders on better range management practices and work to enforce these practices to ensure that this way of life can remain sustainable (WHP 2008g, pg. 3-6).

The Chapter needs to plan for jobs for the large and growing young population. According to Chapter members during the workshops, many members have moved to other communities in order to find employment. Creating jobs within the Chapter is essential to keeping younger population within the Chapter, or at least providing that opportunity (WHP 2008g, pg. 3-6).

New housing subdivisions should be built near necessary resources. Housing clusters should be constructed in areas where water and electricity are already available. These housing development sites should also be located within easy reach of community amenities such as emergency access (WHP 2008g, pg. 3-6).

It is important for the community to plan ahead before proceeding with growth. The Chapter needs to protect natural resources such as water, wildlife, and cultural areas. Plans need to be created to handle the hazards of new industrial opportunities before committing to new operations (WHP 2008g, pg. 3-6).

6.16 Leupp Chapter Development Obstacles

The Leupp Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them. Some of the obstacle the Chapter sees are no financial management plan, absence of active involvement, no community infrastructure, lack of a complete development plan, lawful restrictions, and outdated community assessment (WHP 2008g, pg. 3-3, 3-4).

6.17 Leupp Chapter Strategic Directions

In order to surpass these development obstacles, the Chapter has identified strategic directions for each obstacle. To promote community involvement, the Chapter needs to improve involvement with all Chapter members. Improved visual presentations, such as PowerPoint presentations, can engage an audience much better with strong graphic aids. Mailings to individual Chapter members and radio announcements will inform Chapter members of upcoming meetings. Meals provided during public meetings can draw members to a meeting during lunch or dinner hours. Bilingual presentations are more inclusive for all members. By scheduling public meetings on weekends, more Chapter members will be able to attend community meetings because fewer members will be at work (WHP 2008g, pg. 3-4).

Newsletters sent to Chapter members will inform them of current events and upcoming meetings. Expanded use of the Internet can help the Chapter reach members who are not able to attend community

meetings and will allow for feedback beyond the timeframe provided by a meeting. Email and regular mailings should be used to remind members of upcoming elections. It is important to encourage and reward Chapter members to participate in the public process (WHP 2008g, pg. 3-4).

A financial plan is needed to determine the amount of resources needed to address these needs and how resources will be allocated. It will also determine the amount of resources allowed to employ a grant writer and planner to help facilitate this process (WHP 2008g, pg. 3-4).

To help stop the loss of language, cross-cultural and cross-generational mentoring will help tribal members share their cultural experience and knowledge. The Chapter needs to promote the preservation of the Navajo language by encouraging bilingual education and conversation. The Chapter also needs to encourage Ké, Navajo common law, which is a gesture of Navajos respecting one another and placing Navajo customs and beliefs above government rules (WHP 2008g, pg. 3-4).

The Chapter needs to develop and adopt a Comprehensive Land Use Plan (CLUP) that defines the problems, has long- and short-range goals, and prioritizes projects. Projects should be prioritized with a detailed cost analysis (WHP 2008g, pg. 3-5).

Enhancing the qualifications of people in the workforce is an important part of economic development in the chapter. During the workshops, members identified a need for workforce training. The Chapter could provide cardiopulmonary resuscitation (CPR) and food handler training, which are essential to the hospitality industry. Scenic views and proximity to the Grand Canyon provide the Leupp Chapter with potential for growth in the hospitality service industry (WHP 2008g, pg. 3-5).

Satellite continuing education courses from nearby vocational schools could further provide training for the local workforce. In addition, this vocational training could be incorporated into the local high school curriculum to provide the Chapter's youth with the skills necessary for holding quality jobs on the reservation (WHP 2008g, pg. 3-5).

Possibly the most important part of enhancing the workforce and maintaining qualified employees in the Chapter is to provide competitive salaries. It is not uncommon for Navajo Nation residents to seek higher-paying employment in nearby off-reservation communities. Seeking private grants or establishing relationships with private funders may provide the resources for recruitment efforts that include a guaranteed salary or scholarships in exchange for a commitment of particular years of service within the community (WHP 2008g, pg. 3-5).

6.18 Leupp Chapter Community Needs

Community Resource Needs were identified and divided into the following areas:

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety

- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

6.18.1 Infrastructure

All Chapter members need to be connected to water, wastewater, power, and to a telephone. Before this can take place a wastewater treatment plant needs to be constructed. Many homes do not dispose of their trash properly because there is no solid waste transfer station (WHP 2008g, pg. 3-6).

The Chapter has identified Dinnebeto Wash and Grand Falls as areas that it wants to develop. Dinnebeto Wash needs to be connected to irrigation water. Grand Falls needs to be connected to water and electricity (WHP 2008g, pg. 3-6).

Improved cellular communications infrastructure will improve quality of life. Some rural Chapter members do not have cell phone service or other telecommunications service at their homes. These people have to drive to locations where cell phone service is available in order to make a phone call, a major inconvenience that could add time to emergency response. In addition to spotty cellular communications, Internet access is also sparse (WHP 2008g, pg. 3-6).

6.18.2 Transportation

The current road system needs major improvements. During the wet season or heavy snow-melt transportation between communities becomes unreliable because roads are washed away or destroyed. This type of destruction is inconvenient and dangerous not only to Chapter members, but emergency response is halted or drastically delayed. A transportation plan needs to be developed to identify and prioritize what improvements need to take place. A road to Grand Falls paralleling the Little Colorado River with a bridge is needed (WHP 2008g, pg. 3-6).

6.18.3 Housing

At the planning workshops, participants identified the top need as housing, particularly in the FBFA. Chapter members desire new homes constructed of long-lasting materials. A diversity of housing types is needed within the Leupp Chapter. Group homes for the elderly are needed to house the aging population. In the past, many newly constructed homes were provided to elders, leaving young families still in need of housing. Clustered housing is needed in the central community area near municipal utilities, and other community amenities. There is also a need for mobile home sites, which are ideal for residents who do not have time to acquire a homesite lease or might want to move elsewhere in the future (WHP 2008g, pg. 3-7).

6.18.4 Health and Public Safety

Although there are healthcare facilities in the Chapter, there is a need for more advanced and specialized medical services that only a hospital, elder care center, or nursing home can provide. The Chapter has access to a police service and a fire station; however, the facilities are inadequate. A new police station and fire station are needed it the community. Also, there is a need for an improved communications system, because the current one is unreliable and increases response time (WHP 2008g, pg. 3-7).

6.18.5 Community Facilities, Parks, and Recreation Needs

The Chapter House is used by community members for meetings and is considered a center of the community; however, there is a need for more room. A multi-purpose facility needs to be constructed that will provide this additional space. The multi-purpose facility can house the daycare facility, youth recreation center, church, and computers (WHP 2008g, pg. 3-8).

Chapter members also identified the desire to develop Grand Falls and designate land for a veteran‘s memorial park and amusement park (WHP 2008g, pg. 3-8).

6.18.6 Economic Development

There is a need for more employment opportunities for all Chapter members (WHP 2008g, pg. 3-8). Although there already exist ranching and farming industries in the Chapter, these industries need to be managed better. A range, livestock, and farming management plan needs to be developed to improve and expand services (WHP 2008g, pg. 3-9).

The construction of bullpens, earthen dams, irrigation to Dinnebeto Wash, and a windmill are facilities that would improve ranching and farming capabilities within the Chapter.

Chapter members identified a need for a gas station, grocery store, and laundromat. Chapter members felt that a Casino would be profitable in the area, as well as a radio station. The Chapter is located in an environment that has great sun and exposure. Chapter members also identified the need for solar panels and wind power (WHP 2008g, pg. 3-9).

6.18.7 Education

There are educational facilities available for young children, but there are no facilities or programs for lifelong learning. The Chapter needs to secure funding for continuing education programs and pre-school programs. An educational needs assessment needs to be conducted in order to justify new schools within the Chapter. Suitable sites need to be identified and withdrawn for any new facility. The Chapter will have to coordinate with other government agencies to secure funding for new educational facilities and programs (WHP 2008g, pg. 3-9).

6.18.8 Open Space, "Areas of Avoidance," and Grazing Needs

The Chapter landscape is fragile. The Chapter needs to create programs to protect water quality, wildlife, and minerals in the area. During the Chapter workshops, participants identified several AOA such as Grand Falls (WHP 2008g, pg. 3-9).

6.19 Leupp Chapter Priority Capital Improvement Projects

These needs are fully outlined in the 2008 Leupp CLUP (WHP 2008g). Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote. The top projects the residents would like to see occur first include scattered housing, power line in Grand Falls and other areas, paved road to Cameron along Little Colorado River, Bridge, and Grand Falls, affordable grocery store, humane society (cats/ dogs), trash collection, hospital, elder care/ nursing home, water development in Grand Falls and other areas, waterline extensions for all areas, increased computer use and facilities, salvage and recycling, Veterans Memorial Park, cellular tower/ reception, laundromat, and life skills/communication (WHP 2008g, pg. 3-1).

6.20 Leupp Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the community workshops. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008g, pg. 3-11).

6.20.1 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008g, pg. 3-11):

6.20.1.1 Community Facilities

- Youth Recreation
- Multi-purpose center with library
- Daycare
- Church
- Chapter House Renovation & Addition (Design Complete)
- Senior Citizen Center
- Post Office

6.20.1.2 Healthcare

- Feasibility Study for Nursing Home
- Improved Healthcare

- Elder Care/Nursing Home
- Dental

6.20.1.3 Education

- Maintain Existing Public School
- Opportunities for Lifelong Learning
- Life skills/Communication
- Skill Center/VoTech

6.20.1.4 Infrastructure and Utilities

- Power line Development Plan
- Power line Extension – North Grandfalls (4 phases, 23 families)
- Power line Extension – South Grandfalls (2 phases, 15 families)
- Power line Extension – North Leupp (2 phases, 10 families)
- Power line Extension – South Leupp (18 families)
- Power line Extension – East Canyon Diablo (23 families)
- Power line Extension – West Canyon Diablo (5 phases, 33 families)
- Earthen Dam – Identify all sites/clean out
- Windmill Livestock
- Water Development in Leupp Chapter/Plan Area
- Solid Waste Management/Recycle
- Transfer Station

6.20.1.5 Open Space, Cultural Sites, and Grazing

- Preservation of Wildlife (identify areas to preserve)
- Range Management
- Livestock Management
- Preservation of Grand Falls
- Farm Development North of Beaver Farm
- Bull Pens
- Alfalfa Farm/Field (explore feasibility)
- Improvement of Individual Farm Fields

6.20.1.6 Economic Development (WHP 2008g, pg. 3-12)

- Casino Development
- Gas Station
- Affordable Grocery Store
- Rental Units/Apartments for Non-residents

6.20.1.7 Public Safety

- Fire Department

- Police Department
- Improved Communication System (Safety) – 911
- Humane Society (cats/dogs); Availability of Services
- Trash Collection/Recycling Bins
- Ambulance Service (Helipad)
- Rural Addressing

6.20.1.8 Transportation

- Thoroughfare (Roads) Plan

6.20.1.9 Housing

- Scattered Housing
- Clustered Housing in Main Development Area

6.20.1.10 Media

- Increased Computer Use and Facilities

6.20.2 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008g, pg. 3-12):

6.20.2.1 Healthcare

- Hospital/Clinic
- Eye care

6.20.2.2 Infrastructure and Utilities

- Telephone Landline
- Dinebito Wash (irrigation water)
- Cellular Tower/Reception for All Areas
- Wastewater Treatment
- Lagoon in All Areas
- Waterline Extensions for All Areas
- Septic Tanks for All Areas

6.20.2.3 Economic Development

- Wind power along Colorado River (feasibility study)
- Eating Establishment
- Solar Panels
- Laundromat
- Vet Clinic

6.20.2.4 Public Safety

- Paved Road to Cameron
- Grand Falls Crossing Development
- Bridge at Grand Falls – Upgrade Bridges

6.20.2.5 Parks and Recreation

- Grand Falls Development

6.20.3 Phase Projects: 10-15 Years

The following represents the project identified by one small group as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008g, pg. 3-13):

6.20.3.1 Community Facilities

- Airstrip

6.20.3.2 Economic Development

- Bank

6.20.3.3 Parks and Recreation

- Amusement Park
- Veteran‘s Memorial Park

6.20.3.4 Media

- Radio Station

6.21 Preferred Development Sites

The Chapter identified several areas as ideal locations for future development. There are plans for a business park in the southern portion of the Chapter (WHP 2008g, pg. 4-31). One potential development site was identified away from the business center but also in the southern portion of the Chapter (WHP 2008g, pg. 4-31). This is a location suitable for wind power generation.

Agricultural projects are geared to on-site improvements, such as earthen dams to create livestock ponds, moveable and permanent fencing, windmills, and pasture improvements. These projects are dispersed throughout the Chapter and would benefit individual sites (WHP 2008g, pg. 4-31).

Housing projects are planned for the FBFA in the form of new scattered housing (WHP 2008g, pg. 4-31).

7. Tolani Lake Chapter

This Chapter includes the community of Tolani. It is bordered by Coalmine Canyon Mesa Chapter and the Hopi Reservation to the north, the Teestoh Chapter to the east and the Leupp Chapter to the west. Approximately eighteen percent of the Chapter (28,263 acres) is located within the FBFA (WHP 2008h, pg. I-1).

7.1 Tolani Lake Chapter Physical Setting

The topography includes sand dunes, red mesas with valleys, hills, and arroyos, as well as rich basins along the arroyos that are suitable for farming. One of the four Navajo sacred mountains, the Dook'o'oosliid, is located to the west of the Chapter (WHP 2008h pg. I-6). Chapter elevation varies between 1,400 meters above sea level to 1,630 meters above sea level.

The Chapter is less than 40 miles away from the Grand Canyon National Park, which received 4.4 million visitors in 2007 (WHP 2008j). Visitors have the option to take a 57-mile scenic drive from Cameron to the Grand Canyon Village along Highway 64, following the Little Colorado River Gorge, and passing through the Little Colorado River Tribal Park (WHP 2008j). Chapter vendors offer arts and crafts for sale at two scenic overlooks along this route. Highway 89 runs north from Flagstaff through the Cameron Chapter. This route is a heavily traveled route that brings significant tourist traffic through the Chapter (WHP 2008j).

7.2 Tolani Lake Chapter Land Status

The northwestern portion of the Chapter is located within the former Bennett Freeze Area. These lands were in dispute between the Navajo and Hopi Tribes, and so Interior Secretary Bennett placed a hold on construction, development, and the maintenance of structures in 1966. The Chapter is located within Navajo Nation Land Management District 5 (WHP 2008h, pg. II-28). The Chapter is comprised of trust land with no private holdings (WHP 2008h, pg. II-27).

7.3 Tolani Lake Chapter Land Use

The majority of the Chapter's land is used for grazing cattle and sheep. Tolani Lake is located within Grazing District 5 of the Navajo Nation. The majority of the 157,240.40 acres in Tolani Lake is used for grazing purposes. There is no commercial farming in the area, except for one 170-acre community farm, Sand Springs Farm (WHP 2008h, pg. I-5).

7.4 Tolani Lake Chapter Population and Housing

Presently Tolani Lake has a population of approximately 400 people in the developed area of the Chapter (WHP 2008h, pg. I-5), but the 2000 U.S. Census states that the population for the Chapter was 755

individuals (WHP 2008h, pg. II-1). The community of Tolani Lake includes a Chapter House and Tolani Lake Elementary School Academy with approximately 50 students. Development efforts currently include the Chapter House, Head Start Building, Senior Citizens Center, Elementary School, and about 100 Navajo Housing Authority (NHA) housing units. The Chapter has widely scattered home sites where Navajo families continue traditional use of land for livestock grazing, and many remotely located Navajo families have built their own homes (WHP 2008h, pg. I-5).

7.5 Tolani Lake Chapter Government and Utility Infrastructure

Employment opportunities are very limited in the Tolani Lake Chapter, and most of the workforce is employed by private companies and government entities in Leupp, Tuba City and Flagstaff. Most work for private companies (49.7%) and 41.8 percent work for the government (WHP 2008h, pg. II-17).

Infrastructure for Tolani Lake includes water, wastewater, electric, telecommunications, and road systems in the main community area, which are available to developed areas of the Chapter and limited to areas in the outskirts of the community, particularly in the FBFA. Infrastructure and utilities are recommended for an upgrade before new development occurs (WHP 2008h, pg. II-34).

Currently the Chapter does have electrical power, but it is not sufficient for its use. Three-phase power is needed to support current and future development, but the current power available is single phase. Solar power is anticipated for development and should be provided to all families in remote areas (WHP 2008h, pg. II-35).

A wastewater system is needed in the Tolani Lake community, and there is a preference that a low-cost system be provided to residents located away from a major wastewater line, with assistance for periodic servicing if it is a septic system. In addition, a solid waste transfer station is needed so that people can dispose of waste in a proper and safe manner. Unfortunately, unsanctioned dumping sites are common in the chapter and create health hazards. Most people in the chapter use wood as their primary heating source since natural gas infrastructure is not present. In addition, propane is widely used throughout the Chapter and there are distributors available in nearby towns. According to the 2000 U.S. Census, only about 17 percent of Chapter residents have access to phone lines. Therefore, more Chapter residents have come to rely on their cell phones for communication, but cell phone coverage and services are incomplete and insufficient in the area. Internet service is available in the Chapter, but it is unreliable and insufficient and needs to be improved (WHP 2008h, pg. II-39).

There are a number of roads in the Chapter that need to be relocated, renovated, or constructed, such as Navajo Road 6720 that connects the Chapter to Tuba City and needs to be relocated west of its current position, in order to avoid Hopi land. Owning a car is a necessity for people who live in remote portions of the Chapter since there is no regional public transportation in the Western Agency, and water has to be hauled in by the resident. In addition, shopping and services are located in neighboring chapters or nearby cities such as Winslow and Flagstaff (WHP 2008h, pg. II-43).

7.6 Tolani Lake Chapter Environmental Safety Status

There is no commercial or industrial activity in Tolani Lake, and when uranium mining operations located north of the community were abandoned, the trading post closed after the business lease expired (WHP 2008h, pg. II-18). The nearest abandoned uranium mine to the Tolani Lake Chapter and located within the FBFA is approximately 7 miles northwest of the Chapter.

7.7 Tolani Lake Chapter Water

7.7.1 Surface Water

Neither flood plain maps nor historical surface water flow data is available for most of these areas. The Dinnebeto Wash crosses the chapter, but there are no bridges over this wash and rural unpaved roads that cross it are impassable when water is present. Other major surface water features include the Polacca Wash and the Oraibi Wash (WHP 2008h, pg. II-30).

Chapter surface water is used for agriculture and livestock. When it rains, streams and washes are filled with water, which in turn fills watering holes. During times of drought, livestock has access to well water, either directly from the well or hauled to watering places.

The Chapter lies within the Little Colorado River Basin, which is part of the larger Colorado River water system. The Little Colorado River rises in eastern Arizona and in southeastern Apache County and flows northwest through a series of deep gorges directly underneath the Chapter's planning area. It joins the Colorado River in the Grand Canyon, approximately 70 miles north of Flagstaff (WHP 2008c, pg. 2-34).

There are at least 4 washes concentrated in the northern portion of the planning area.

7.7.2 Ground Water

Groundwater in portions of the Chapter can be found at 137 feet below the surface. The Chapter is located along the edges of the Little Colorado River Basin where water-bearing rocks consist primarily of sandstone, limestone, and other conglomerates. Monoclines cross the area and provide structural control for the movement of groundwater along the regional gradient. The Chapter acquires its water from the C-aquifer, which can be provided in the form of underground waterlines or in safe, tested, and monitored nearby watering points, which are locations where individuals travel to in obtain their water (WHP 2008h, pg. II-36).

7.7.3 The Coconino Sandstone

The C-aquifer system yields water of good chemical quality except southwest of Leupp and in the northern part of the Black Mesa basin where excessive amounts of dissolved solids could render it unfit for use. The C-aquifer includes the Coconino Sandstone, the De Chelly Sandstone, the Moenkopi Formation, and the Shinarump Member of the Chinle Formation. The Coconino Sandstone is of very fine to medium-grained, well-sorted quartz grains. The grains are coarse near the southern extend of the unit

along the Mogollon Rim and grade into a finer grain size to the north. The De Chelly Sandstone is a thick-bedded fine- to medium-grained sandstone and hydraulically connected with the Coconino and the Shinarump Member of the Chinle Formation. The Chinle and Moenkopi Formations consist primarily of mudstone and siltstone beds. The Chinle Formation and the De Chelly and Coconino Sandstones are the primary sources of groundwater. The other members of Chinle Formation and the Moenkopi Formations are too fine-grained and act as aquicludes. The C-aquifer system thins rapidly to the north and pinches out along the Utah-Arizona border (WHP 2008c, pg. 2-41).

7.7.4 Wetlands and Flooplains

Historical surface water flow data is not available for most of the FBFA, nor are flood plain maps. There are some recorded wetlands in the Chapter and fresh water ponds located northwest of the community of Tolani. Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas of Coconino County, Arizona, dated June 5, 1997, showed that all areas of the Navajo Indian Reservation have not been mapped for flood plain hazards (WHP 2008h, pg. II-30).

7.7.5 Water Rights

In portions of the Chapter, water systems have had to be abandoned because of contamination, and so new water rights are very difficult to obtain since they are, for the most part, fully appropriated. Those who currently have rights to clean water are reluctant to sell or part with them (WHP 2008h, pg. III-4).

7.7.6 Chapter Water Needs

Waterlines and other utilities are often not constructed until there are structures or development planned. In addition, development is only planned for areas that currently have infrastructure to support them. In Tolani Lake, existing structures in remote areas have not been connected to water or utilities since they are not available in those areas.

7.8 Tolani Lake Agricultural Resources

7.8.1 Community Farmers

Tolani residents consider traditional, community farming of crops such as corn, squash, and beans very important to their way of life. Workshop participants noted that irrigation infrastructure should be developed for larger community and commercial farming opportunities, and more dry farming could be added. The Chapter needs to create policies and programs to protect water quality, wildlife, and minerals in the area, and that some areas should be avoided such as shrines, eagle nests, burial sites, archeological sites, and Dinebito Wash (WHP 2008h, pg. III-13).

Much of the Chapter's land is leased to grazing-permit holders, and raising grazing animals is a way of life for many residents and should be protected and strengthened. A range management plan is needed for

completion and enforcement in order to address overgrazing and to protect grazing areas (WHP 2008h, pg. III-13).

7.8.2 Tolani Lake Soils

The soil composition within the Chapter ranges from sand to loamy sand soils. The soil profile includes light reddish-brown sand: reddish-brown; single grain: loose, very friable, nonsticky: diffuse boundary; very fine roots; no observable pores between 0-18 inches. The deeper layer includes light reddish-brown sand: reddish-brown; single grain: loose, very friable, nonsticky: diffuse boundary; very fine roots; no observable pores between 18-36 inches. Increase of lime with progressive increase in depth (WHP 2008h, pg. II-32).

7.9 Tolani Lake Biological Resources

7.9.1 Threatened and Endangered Species and Resource Protection Zones

The northern portion of the Chapter contain some sections classified by the NNDFW as Resource Protection Zone 1, a highly sensitive wildlife resource area. The central portion west of Tolani is designated as Resource Protection Zone 2. The remaining area within the Chapter is designated as Resource Protection Zone 3, which is considered a low- sensitivity area (found at: http://www.nndfw.org/zones/chapter_home.htm).

7.10 Tolani Lake Mineral Resources

7.10.1 Minerals

The Chapter needs to create policies and programs to protect water quality, wildlife, and minerals in the area, and mineral deposits should also be used wisely to ensure sustainability (WHP 2008h, pg. III-6-13).

Uranium is known to exist within the Chapter as evidenced by a remediation plan for contamination caused by uranium mining, which would involve a study to conduct inventory on uranium contamination sites throughout the region and develop a strategic plan to remedy environmental health hazards (WHP 2008h, pg. IV-11).

7.11 Tolani Lake Cultural and Traditional Resources

7.11.1 Cultural Resources

The NNHHPD has inventoried and mapped the locations of archeological several sites and previous project locations, but there is currently a lively debate about whether these special areas should be

mapped or not. Some say that mapping helps preserve and pass on important cultural and spiritual knowledge across generations and into the future, while others say this information should be passed orally and personally from generation to generation. Either way, the chapter needs to establish policies and procedures for how to assure that lands planned for development are not areas to avoid. Recognized archeological sites, shrines, eagle nests, and burial sites need to be protected from development and preserved (WHP 2008h, pg. II-33-34).

The Navajo's traditional subsistence lifestyle includes using the land to gather a variety of plants/herbs for medicinal and ceremonial purposes and materials for arts and crafts. The areas that provide these resources are considered "areas of avoidance" – traditionally and culturally sensitive areas to be protected from development in perpetuity to preserve their historic significance or ongoing ceremonial use (WHP 2008h, II-33-34).

7.12 Tolani Lake Chapter Community Needs Assessment

The community needs assessment includes infrastructure and utility needs; transportation needs; housing needs; health and public safety needs; community facilities, parks and recreation needs; educational needs; economic development needs; and open space, "areas of avoidance," grazing and agricultural needs. In addition, there is need for the Chapter Vision and Goals for the FBFA, resource needs, identification of specific actions and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter (WHP 2008h, pg. III-7-13).

7.12.1 Tolani Lake Vision

The Chapter's vision includes each home having adequate plumbing and access to safe water for drinking and domestic use. Homes that are too far from existing systems should be retrofitted for plumbing and provided nearby watering points, where safe water for drinking and domestic use can be collected and hauled; and homes located close to existing water systems should be hooked up (WHP 2008h, pg. III-7).

In the long-term, Chapter members want to maximize the benefits of modern opportunities, but at the same time maintain the integrity of traditional Navajo culture. Chapter residents want to preserve their rural atmosphere, but bring in modern amenities such as telephones, electricity, and plumbing to all residents who desire them.

The Tolani Lake Chapter would like to achieve this vision in the following way (WHP 2008h, pg. III-1);

Tolani Lake Chapter will ensure that all residents have homes in a safe, livable condition, including basic infrastructure such as electricity, telephone, and plumbing. Members of the Chapter will have access to shopping, health services, employment, education, and recreational opportunities to improve the quality of life for all residents.

7.13 Tolani Lake Chapter Goals

7.13.1 Guiding Principles

During the 2008 community workshop, members outlined goals for the Chapter that will aid in reaching the vision, which include community policies, capital projects, and community service (WHP 2008h).

The Chapter would like to provide for people's basic needs, such as power and water. The Chapter needs to plan for improving the overall health of its members. Public safety and emergency medical service needs improvement to better respond to emergency situations (WHP 2008h, pg. II-1-2).

Chapter members will have places to gather and meet, students of all ages will have educational opportunities, additional economic and industrial development will provide employment opportunities for all Chapter members, and all residents will have adequate public safety (WHP 2008h, pg. III-2).

New developments should not harm the natural environment or negatively impact traditional ways of life. It is important to protect water quality and groundwater for future generations. Other natural resources such as mineral deposits should also be used wisely to ensure sustainability. Any cultural sites within the Chapter should also be preserved. New developments in the Chapter should incorporate community-supported agriculture to provide healthy local food to the community (WHP 2008h, pg. III-1-2).

7.14 Tolani Lake Chapter Goals

During the community workshops held during summer 2008, community members outlined goals for the Chapter that will aid in reaching this vision. These goals include community policies, capital projects, and community service (WHP 2008h, pg. III-1).

All residents who wish to live in the Chapter will have safe, durable, energy-efficient homes with access to electricity and safe drinking water, whether they are located near the center of the community or in remote areas. Residents will have a full range of housing options to support each stage of life and all financial circumstances. Chapter members will be able to live in scattered homesites if they are grazers who prefer to live a subsistence lifestyle, or clustered housing developments if they prefer the amenities and infrastructure of a modern community (WHP 2008h, pg. III-1-2).

The road system will be improved and maintained to be safe and efficient in all weather conditions and seasons. Infrastructure within the community will be improved, to provide water and electricity to all residents. Solid waste will be collected safely and reliably at a Chapter transfer station (WHP 2008h, pg. III-2).

Improved cellular communications infrastructure will improve quality of life and safety for all residents. Nearby emergency health, fire, and police facilities and substations will provide a quick response to medical and safety emergencies (WHP 2008h, pg. III-1-3).

Community facilities and services are an important part of the community vision. The Chapter wishes to improve education, including educational facilities for the Chapter's youth. A multi-purpose community

center will provide a place for community members to congregate for recreational activities or community meetings (WHP 2008h, pg. III-1-2).

Economic development will improve quality of life for the Chapter and retail and recreational opportunities for tourists. Ranchers will have nearby water resources for livestock (WHP 2008h, pg. III-2).

7.15 Tolani Lake Chapter Obstacles

The Tolani Lake Chapter has identified development obstacles and formulated possible solutions to surpass or avoid them. Some of the obstacles include lack of available land for development. There is not much land available for community development facilities or new homes due to the large number of grazing permits in the Chapter. The land withdrawal process to remove some of the grazing land to be used for development is a lengthy process that many grazing permit holders may not support. This is due to lack of adequate compensation for the grazing land withdrawal and the absence of feasibility studies for economic development projects that could allow land to be withdrawn for projects that are not justifiable (WHP 2008h, pg. III-3).

There have been a number of studies conducted to determine the needs of the Chapter, which have proposed a number of alternatives to address the Chapter needs. However, many people feel they have not received the support of tribal leaders and the Navajo Nation's central government. When a study is conducted and there is support for a project, usually there are not enough resources to complete it. Very few individuals know how to successfully access federal funding, and funds allocated to the Chapter come with guidelines that are difficult or impossible to meet or achieve. Usually funds are not sufficient to cover the full cost of the project, so more funding sources are needed to complete it (WHP 2008h, pg. III-3-4).

The Chapter will need to balance the protection of grazing land with the development of facilities to improve the quality of life of all residents since ranching is part of the community's vision for the future. This negotiation will require much public education and ongoing discussion to acquire (WHP 2008h, pg. III-3).

In order to determine where and how future growth will take place, a suitability or feasibility study needs to be conducted. Progress needs to be seen in order to believe in planning or to have reasons to get involved. There are political obstacles from Navajo Nation departments, other agencies, and politicians that prevent projects from being completed (WHP 2008h, pg. III-3-4).

Water systems have had to be abandoned due to contamination in some areas. New water rights are very difficult to obtain since they are typically already taken, and those who currently have rights to clean water are reluctant to sell or part with them. In addition, the Chapter is experiencing a greater need for housing than there is supply (WHP 2008h, pg. III-3-4).

7.16 Tolani Lake Chapter Resource Needs

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/Utility
- Transportation
- Housing
- Health and Public Safety
- Community Facilities
- Economic Development
- Education
- Open Space, AOA, and Grazing

7.16.1 Proposed Capital Improvement Projects

Participants nominated and voted on the following items as the most important capital projects from the vision over the course of the two workshops. The highest priority improvement projects include scattered housing, power line in Grand Falls and other areas, paved road to Cameron along Little Colorado River, bridge and Grand Falls, affordable grocery store, humane society for cats and dogs, trash collection and casino (WHP 2008h, pg. III-14).

7.16.2 Tolani Lake Chapter Priority Capital Improvement Projects

These needs are fully outlined in the Tolani Lake CLUP 2008, pages III-14. Once these resource needs were identified, the Chapter voted on which actions/projects should be addressed first through a vote.

7.16.3 Tolani Lake Chapter Priority Project Phasing

This section outlines the phasing of the projects that received the most individual votes from Chapter residents at the second community workshop. Phase 1 would be constructed in 5 years or less, Phase 2 would be constructed in 5-10 years, and Phase 3 projects would not be complete for another 10-15 years (WHP 2008h, pg. III-15-19).

7.16.4 Phase 1 Projects: 1-5 Years

The following represent the projects identified as part of Phase 1 Developments by the voting groups. These are considered the items most urgently needed by Chapter residents (WHP 2008h, pg. III-15-17):

7.16.4.1 Public Safety

- Police Officers in Tolani Lake (increase #)
- Emergency Clinic/Trauma Center (make accessible)
- Community Nurse – reestablish through CHR

- Mobile Van for Healthcare, 1 time per month
- Mobile Van for Dental Care (continue present arrangement/available upon request)
- Security Lights – work on individual basis with NTUA; replace sensor lights on individual homes
- Direction Signs
- Cattle Guards at identified locations
- Emergency Preparedness Plan
- Rural Addressing System

7.16.4.2 Health

- Medicine Men (NAC, traditional, licensed)
- Health care Clinic; Dental; Disabled Clinic
- Mobile Van for Health Care/Mobile Van for Dental Care – Expand Mobile Services to FBFA
- Community Health Representative
- Disease Prevention
- Family Counseling
- Alcohol/Tobacco/and other Drug Programs
- Peace-making Center
- Educational Programs
- Veteran Center – reestablish at Tolani Lake

7.16.4.3 Community Facilities

- Group Home for Elderly
- Senior Center
- Recreation Center
- Church
- Multi-purpose Recreation Center with Computer Center, Meeting Rooms, Conference Room
- Sub-office for Bennett Freeze issues – regional office
- Social Services Office
- Post Office
- Chapter House Improvement
- Health Care Clinic
- Veterinarian
- Head Start
- Livestock Yard
- Peace-making Center/Conflict Resolution
- Veteran Center

7.16.4.4 Infrastructure Utilities

- Increased Carrying Capacity – 3 phase electric lines

- Waterline; Drinking Water and Emergency Use
- Power lines to Workers, Al McCabe, Cal Nez, Williams; tied with waterline
- Drinking Water for Workers, McCabe, Nez, Williams
- Watering Point
- Livestock Waterline – need feasibility study; possible source is Beaver Farm
- Water Storage Tanks; 2-3; tied with drinking water for Workers, watering point, and water for livestock
- Solid Waste Transfer Station
- Wastewater system; low cost to residents
- Internet
- Landline Phone Lines; Tied with Internet
- Cell Phone Tower/Service
- Solar System
- Earthen Dam
- Water User Association
- Livestock Association
- Water Hauling
- Firewood

7.16.4.5 Economic Development

- Feed Store; Horseback riding (trail rides)
- Flea Market; agriplex
- Activity Center
- Tolani Lake Enterprise
- Hay

7.16.4.6 Transportation

- Move Road to Tuba City west to avoid Hopi Lands through BF, #6720 to Coalmine
- Road to Tuba City
- Y-west (Hopi managed?) maintain 6730
- New Paved Crossing for Dinebito Wash, especially during snow on 2-year plan – culvert, bridge, feasibility study
- Maintain Existing Roads
- Helicopter Service

7.16.4.7 Open Space, Cultural Sites, and Grazing

- Protection of Grazing Areas
- Protection of Shrines, Eagle Nests, Burial Sites, Archaeological Sites
- Dryland Farming

- Probate – 190 Days
- District 5 Grazing Permits
- Dinebito Wash
- Black Falls

7.16.4.8 Housing

- Scattered Homes; Individual Homes at Own Site
- Affordable Housing
- Elderly Living Homes/ Disabled Group Homes

7.16.4.9 Education

- Navajo Language School
- Head Start; Elementary School; High School; Middle School; Buses
- Law Enforcement Programs (DARE)
- Financial Assistance for College/Scholarships

7.16.5 Phase 2 Projects: 5-10 Years

These are projects that realistically will take 5-10 years to get on the ground (WHP 2008h, pg. III-17-18):

7.16.5.1 Public Safety

- Fire Station located with Chapter Tract
- Ambulance Service in Tolani Lake, make accessible
- Health
- ER/Trauma Center
- Ambulance

7.16.5.2 Community Facilities

- Convalescence Center for Elderly
- Youth Center
- Legal Services/Office

7.16.5.3 Economic Development

- Laundromat
- Trading Post/Convenience Store/Gas
- Garage/Mechanics/Tire Store

7.16.5.4 Coop, Produce

- School Employment
- Gravel Pit Development
- Casino

7.16.5.5 Parks and Recreation

- Parks located on Chapter Tract (land withdrawn)
- Playground (Black Falls Church Area)
- Recreation Center; basketball outside, baseball fields

7.16.5.6 Open Space, Cultural Sites, and Grazing

- Irrigation Farming

7.16.5.7 Education

- Community Training Center

7.16.6 Phase 3 Projects: 10-15 Years

The following represents the project identified as part of Phase 3 Developments. This project should be considered part of future efforts to expand economic development opportunities for local residents, including providing additional jobs and adding on to existing livestock management knowledge and expertise (WHP 2008h, pg. III-18-19):

7.16.6.1 Public Safety

- Fire Hydrants for Cluster Homes within Total Community
- Crosswalks – safety issue for 6720
- Emergency Shelter within Community

7.16.6.2 Economic Development

- Fast Food/Restaurant
- Mobile Home Park
- Wal-Mart, pet store, pawn shop; auto dealership
- Man-made Lake

7.16.6.3 Transportation

- Airport

7.16.6.4 Parks and Recreation

- Tourist Center
- Rodeo Grounds
- Domed Sports Arena Center
- Horseback Trails
- Golf Course
- Outdoor Pool
- Pool Inside

7.16.6.5 Open Space, Cultural Sites, and Grazing

- Sub-Units, Range Management Plan

- Man-made Lake

7.16.6.6 Housing

- Rent-to-Own Housing and Programs
- Rentals
- Mobile Home Park
- Staff Housing (schools)
- NHA Residential Organization

7.17 Preferred Development Sites

Two sites were readily identified for site locations for housing within the Tolani Lake Chapter: the Tolani Lake Community and the Junction of Indian Routes 2 and 24 (WHP 2008h, pg. III-19).

7.17.1 Site #1 - Tolani Lake Community

The housing site proposed for development is 12 acres and is withdrawn by the NHA. There is water available on the site that comes from an existing NHA subdivision west of the site, but road access is poor from a single dirt road that is maintained. Slope is good for development in the area, varying from 5 percent to 2 percent, and drainage is decent due to sandy soils. In addition, electricity is available at the existing subdivision. There is no solid waste service in the area, but there is a landfill close by. There is an existing lagoon at Tolani Lake subdivision which would be utilized as the tie-in manhole, and it is approximately 100 feet away from the site (WHP 2008h, pg. III-19).

7.17.2 Site #2 - Junction Indian Route 2 and Indian Route 24

The housing site proposed for development is 10 acres, and is primarily used for grazing. There are also adjacent sites of commercial, industrial, community service, and rodeo grounds that have been designated. There is water availability across Indian Route 2 and the road access is excellent. The slope of the site is also good for development varying from 5 percent to 2 percent, and drainage is decent. There is electricity available across the major roads. Solid waste service is not present in the area, but there is a landfill close by. To achieve the proposed development, a new lagoon would have to be constructed (WHP 2008h, pg. III-20).

8. Tonalea Chapter

This Chapter includes the community of Tonalea. It is bordered by the Kaibeto, Inscription House, Shonto, Tuba City, Navajo Nation, and to the south it is bordered by the Hopi Reservation. Approximately 33% (49,925 acres) of the Chapter is located within the FBFA (WHP 2008i, pg. I-1).

8.1 Tonalea Chapter Physical Setting

The Chapter is located in northern Arizona, Coconino County and encompasses about 150,738 square miles. The Chapter itself lies on a plateau, and is located south of White Mesa and west of Black Mesa. Chapter elevations range from 7,260 feet on White Mesa to 6,011 feet near Red Lake (WHP 2008i, pg. 1-5). Nearby attractions include Grand Canyon to the west.

8.2 Tonalea Chapter Land Status

The southern portion of the Chapter is located in the FBFA, and as a whole is comprised of trust land with no private holdings (WHP 2008i, pg. 2-26). The Chapter lies in Grazing District 1, Range Unit 1 of the BIA Navajo Western Agency, Branch of Natural Resources (WHP 2008i, pg. 2-27).

8.3 Tonalea Chapter Land Use

The Chapter is primarily open space utilized for grazing. There is a lack of ranger stations within the Chapter that has resulted in insufficient range enforcement, and many people with grazing permits fear that their livestock may be stolen due, and others fear that lack of enforcement will lead to overgrazing as people exceed their limit on livestock. There is a lack of range preservation programs and public education throughout the Chapter, particularly in the FBFA, which has resulted in deteriorating conditions, such as overgrazing and land deterioration (WHP 2008i, pg. 2-26).

Farming, ranching and sheep herding is a major occupation and, a way of life in the Chapter and has been for many years, and has strong connections to the customs and cultural heritage of Chapter members. Tonalea Farms encompasses approximately 90 acres and was established in 1982 (WHP 2008i, pg. 2-29).

8.4 Tonalea Chapter Population and Housing

According to the 2000 U.S. Census the population for the Chapter was 2,537 individuals. The Chapter had a population of roughly 8,700 as of the 2000 census (WHP 2008i pg. 2-3). The population for 2010 was estimated at 2,945, and the 2020 is estimated to be around 3,419 (WHP 2008i, pg. 2-1). Fifty-four percent of the Chapter population includes individuals 24 years or younger, indicating that the Chapter is and will continue to experience a surge of young individuals and families in the future (WHP 2008i, pg. 2-5).

There is 753 housing units found within the Chapter, and the majority of these homes are owner-occupied (89%). Sixty-three percent of these homes were built after 1980, and the median year for structures built in the Chapter was 1985 (WHP 2008i, pg. 2-8-9).

Homes vary among detached homes and mobile homes. The majority of homes are heated from portable petroleum and wood, and 73 percent Chapter members do not have telephone service available. Fifty seven percent do not have plumbing facilities, and many homes are of poor construction quality, and many in the FBFA have become very run down due to the restrictions on improvements. Only 25 percent of homes are in good to very good condition, and 43 percent are in poor to very poor condition, according to field data conducted by WHPacific in 2008 (WHP 2008i, pg. 2-10).

There is a need for more housing options within the Chapter, and there is a deficient amount of clustered housing to serve young families and to meet the needs of the expanding population, but the Chapter has selected a site for future housing. People who wish to move back to the Chapter will need individual home sites within the FBFA, which will impact any grazing in the area (WHP 2008i, pg. 2-12).

8.5 Tonalea Chapter Government and Utility Infrastructure

The current water system in Tonalea Chapter was designed and constructed by the Indian Health Service (IHS), but is currently owned and operated by the Navajo Tribal Utility Authority (NTUA). The water source comes from the N-aquifer, which services the Tonalea and Cow Springs communities and scattered home sites along Highway 160. IHS anticipates to bring water to 171 additional homes in the Chapter's White Mesa area (WHP 2008i, pg. 2-33).

There is an ongoing issue of people drinking water from windmills due to the remoteness of some scattered-site housing, and this could put people at risk for bacterial contamination and air-borne contaminants due to the presence of livestock, as well as vandalism due to remote, unsupervised locations. It is anticipated that to address these issues, the Chapter will provide safe drinking water sources closer to these remote homes, a centralized drinking water truck delivery system, and/or improving the water quality testing and treatment of all water sources, including windmills and earthen dams (WHP 2008i, pg. 2-35).

Tonalea and Cow Springs are connected to a wastewater system, but White Mesa is not. Many of the homes in the Chapter use septic systems to handle wastewater, which sometimes pose environmental risks, and this issue is primarily due to the remoteness of residences (WHP 2008i, pg. 2-36).

A main transmission line runs east to west in the Chapter, and provides electricity to White Mesa, Cow Springs, and Tonalea communities. More than 60 percent of homes in the chapter are connected to electric infrastructure, and these utilities are built and maintained by NTUA (WHP 2008i, pg. 2-38). Propane gas is used in the community to supplement and reduce electric costs for heating and cooking purposes, since natural gas is not available in the Chapter. Currently, there are no plans underway to expand telephone lines, and lines are available only to the Chapter House and the NHA subdivision, with seven pay phones in the community. Therefore cellular phone service has begun to replace the need for landline service in some cases. Trash collects in various areas of the Chapter and causes health hazards for some residents (WHP 2008i, pg. 2-39).

The Chapters are the local government on Navajo Nation, similar to county governments in some states. The Local Governance Act was passed in 1996 to give more power to Chapter governments (WHP 2008j, pg. 57). The Navajo Nation Council maintains ultimate authority on most matters. The three steps outlined in the Act Chapters must follow for increased local authority are: (1) creating and adopting a community land-use plan (CLUP); (2) implementing a five-step system of financial accountability and management; and (3) becoming certified. Each Chapter consists of three elected officials: President, Vice President, and Secretary/Treasurer.

The Navajo Tribal Utility Authority (NTUA), a nonprofit corporation, oversees most utilities on Navajo Nation, including water, natural gas, and electricity. NTUA administers water and wastewater under the auspices of Indian Health Services. NTUA is overseen by a management board under the Navajo Nation Economic Development Committee. Utility prices are determined by an operating tariff set by the management board. Rates are set reservation-wide. The criteria for wastewater services and residences include existing plumbing systems and proximity to a main sewer line (WHP 2008j, pg. 75–76).

NTUA purchases power from multiple power companies and does not produce its own commercial power. NTUA builds and maintains transmission and power lines across the Nation (WPH 2008a, pg. 80). NTUA has the goal of providing power to all residences on the Reservation, but this is difficult largely due to the expanse of land area and scattered residences, often miles from the nearest power line tie-in. To a lesser extent, NTUA installs solar and wind power structures for electrical power generation at residences. NTUA purchases natural gas from outside the Nation. Propane is purchased from private companies.

The Navajo Nation Telecommunications Regulatory Commission manages telephone services, including cellular. NTUA is in the process of designing a fiber optics system that will increase internet access across the Nation. Frontier Communications provides business and residential services for satellite and cable television, land-line telephone, and internet. It leases tower spaces to private cellular companies. There are various options for cell phone providers for locals.

Transportation is managed by the Navajo Department of Transportation (NDOT). NDOT is under the Division of Community and Development, which is under the Transportation and Community Development Committee (TCDC) of the Navajo Nation Council (WHP 2008j, pg. 85). NDOT helps manage the airport in Tuba City. The Navajo Indian Reservation Roads (IRR) Program is administered by the BIA Navajo Area Branch of Roads. Indian Reservation Roads are public roads providing access to various parts of the Reservation. Arizona Department of Transportation (ADOT) manages U.S. Highways and State roads.

8.6 Tonalea Chapter Environmental Safety Status

The Chapter suffers from past uranium mining, resulting in contaminated water and health problems (WHP 2008i pg. 1-5). A study is underway to inventory uranium contamination sites throughout the region and develop a strategic plan to remedy environmental health hazards (WHP 2008i, pg. 4-10).

8.7 Tonalea Chapter Water

8.7.1 Surface Water

Ephemeral washes drained by this Chapter include Behashibito Wash, Shonto Wash, and other unnamed water channels, which flow in a southwest direction toward Red Lake. These washes flow in response to seasonal precipitation events and snow-melt, and most of the year they are dry creeks. They join near Red Lake at the southern end of the Chapter, which is an ephemeral lake that fills only during heavy runoff (WHP 2008i, pg. 2-31). The Chapter is located within the Moenkopi Wash Subbasin, Little Colorado Basin, Subregion, and Lower Colorado Region.

8.7.2 Ground Water

Groundwater in the area of the Tonalea Chapter is part of the Navajo (N) aquifer system, which is found mainly in the Navajo Sandstone. Wells that tap the N-aquifer range from 251 feet to 1,052 feet in depth according to the Navajo Nation Water Resource Management Branch. Wells within the Tonalea community range in depth from 504 feet to 960 feet, and from 251 feet to 550 feet within Cow Springs. There are no wells located near the proposed residential site in White Mesa community (WHP 2008i, pg. 2-33). This aquifer is estimated to store 290 million acre-feet of water, and has some of the better quality water of all the aquifers on the Nation (WHP 2008j, pg. 33). However, approximately 1.5 and 3 billion gallons in the N-aquifer are reported to be contaminated from past Uranium mining (WHP 2008j, pg. 45).

8.7.3 Wetlands and Floodplains

There are no flood plain maps or historical surface water flow data available for most of these areas, nor is there evidence of wetland conditions in the Chapter. Flood plain boundaries have not been determined by federal, state, or tribal entities. An inquiry with the Federal Emergency Management Agency in 2016 revealed that the Flood Insurance Rate Map (FIRM) for the unincorporated areas of Coconino County, Arizona, dated June 5, 1997, showed that all areas of the Navajo Indian Reservation have not been mapped for flood plain hazards (WHP 2008i, pg. 2-31).

8.7.4 Water Rights

The Water Management Branch of the Department of the Water Resources, under the Division of Natural Resources, oversees water on Navajo Nation. The Water Code Administration, part of the Water Management Branch, regulates water on Navajo Nation. It is responsible for implementation of the Navajo Nation Water Code, administers well drilling and water-use permits, resolves water use disputes, and generates revenue for the use of water for construction, industrial, government, and commercial purposes. The Navajo Nation EPA oversees surface and groundwater quality and issues 401 certifications under the Clean Water Act for impacts on Tribal Trust lands. The Navajo Nation EPA is in charge of public water system regulation through inspection, monitoring, and enforcement. Water rights in the Chapter need to be secured to help ensure that the communities can prosper.

8.7.5 Chapter Water Needs

Water storage, transportation, and disposal are under developed across much of the Chapter. Many sources of water may be suitable for livestock but do not meet water quality standards for human consumption. Many homes are not connected to municipal water, and due to their distance from waterlines, this is unlikely to happen in the near future. The installation of additional watering points is one option. This will decrease the distance many residences would need to haul water. Septic systems are in need of improvement and/or maintenance in many areas. As with many places in the Southwest, major water supply projects and infrastructure designed to transport water from other, reliable and sustainable sources are needed for high levels of urban or agricultural development in the Chapter.

8.8 Tonalea Chapter Agricultural Resources

Agriculture in the Chapter is mainly restricted to livestock raising and ranching, and sheep and cattle are the main livestock raised. Grazing permits are required for livestock; and BIA sets the stocking rates. Jobs classified as agriculture, which are lumped with mining, comprise less than 0% of total jobs in the Chapter (WHP 2008i, pg. 2-15). Farming occurs at small scales and is rarely commercial large scale, being limited by a lack of perennial surface water.

8.8.1 Tonalea Chapter Soils

The area below White Mesa and Black Mesa, as well as the areas under evaluation, are part of the Sheppard-Fruitland-Rock Outcrop Association, which consists of somewhat excessively drained and well-drained soils and rock outcrop on plains and plateaus. The plains are broken by prominent mesas, buttes, and escarpments, and steep, rock-walled canyons form the sides of the drainages that traverse the areas. The soils were formed in aeolian sandy material weathered from sandstone and shale. Fruitland soils make up about 35 percent of the association, Sheppard soils make up about 35 percent, rock outcrop about 15 percent, and minor areas of associated soils and dune land and Badland about 15 percent. The minor soils are typically small areas of Moenkopie, Shalet, and Palma. The dune land occurs as scattered areas of low, poorly stabilized dunes of eroded shaly materials, which pose few limitations for home site development. The sandy texture of the Sheppard soils, however, is a severe limitation to shallow excavations (WHP 2008i, pg. 2-31-32).

8.9 Tonalea Chapter Biological Resources

8.9.1 Threatened and Endangered Species and Resource Protection Zones

The Chapter contains two ranked sensitivity areas classified in the Navajo Biological Resource Land Clearance Policies and Procedures (RCP). Area 3 (low sensitivity) covers the most area, followed by Area 1 (high sensitivity). There are no designated critical habitats for federally listed species protected under the Endangered Species Act (ESA) in the Chapter.

There are at least 12 species listed on the Navajo Nation Endangered Species list either occurring or with potential to occur in the Chapter. Species that are also protected under the ESA include black-footed ferret, Southwestern Willow Flycatcher, Welsh's milkweed, and Kanab ambersnail. Most native birds occurring in the Chapter are protected under the Migratory Bird Treaty Act; Bald and Golden Eagles are protected under their own federal law. Navajo Nation provides additional special protection for raptors.

8.10 Tonalea Chapter Mineral Resources

Uranium was the dominant mined mineral in the area through the nuclear boom in the 20th Century. The Navajo Abandoned Mine Lands (AML) Reclamation Department is tasked, with aid from the U.S. Department of Energy, in cleaning up hundreds to thousands of abandoned mines across the Nation.

Large-scale coal mining occurs outside the Chapter to the east on the Black Mesa/Kayenta mining complexes. Oil and gas exploration is increasing on parts of Navajo Nation with the expanse of hydraulic fracturing technology, but the Chapter has yet to a boom as has occurred in New Mexico portions of the Reservation.

8.11 Tonalea Chapter Cultural and Traditional Resources

Sensitive cultural areas include historic sites, such as old home sites, and prehistoric sites. Areas of Avoidance are also protected. These include areas used for gathering plants and materials used for traditional purposes. Specific locations of known archeological sites and previous project locations are not available to the public. Many areas on the Nation are not inventoried for cultural resources until the area is within the footprint of a planned project or development. Cultural resources are overseen by the Navajo Nation Historic Preservation Department, which keeps records of documented sites.

FBFA chapters have noticed activities that threaten culturally sensitive areas and fragile environments. For instance, four-wheelers drive uninhibited through Chapter lands and tourists have been removing artifacts from Chapter land. These types of activities can do irreversible damage to culturally significant areas and environmentally sensitive areas, and it is critical that this be addressed in order to prevent them in the future (WHP 2008i, 2008).

8.12 The Development Plan

The following sections outline the Tonalea Development Plan (WHP 2008i pg. 3-1–3-15).

8.12.1 Chapter Vision

The Chapter vision involves maximizing the benefits of modern opportunities while maintaining the integrity of traditional Navajo culture. The Chapter is ready to look and move forward in a positive direction and leave the negative effects of the FBFA behind. Local empowerment is crucial to this.

8.13 Chapter Goals

Goals outlined in the 2008 Tonalea CLUP (WHP 2008i pg. 3-2–3-3) to reach the Chapter vision include:

- Access to safe and adequate housing
- A range of housing options that match all income ranges and location preferences
- Community facilities and services
- Off-the-grid utilities for homes, including wind and solar power and local drinking water
- Improved infrastructure in the community, including water, electricity, waste management, and cellular communications
- Independent living centers for elderly and disabled
- Economic development through retail and recreation for tourists, grocery stores, casinos, resorts, and commercial development
- Improved and well-maintained roads
- Continued ranching via improved range management

8.14 Development Issues

The following outline the principal development issues for the Chapter, as specified in the Tonalea CLUP (WHP 2008i, pg. 3-3–3-4):

- People unmotivated toward land development—Many residences have grazing permits and may not support land development.
- Incomplete and inconsistent residential planning—Many families have moved away. Obtaining new housing can be difficult due to funding, site requirements, and limited homesites. Political will can be lacking.
- Absence of youth advocates—Gap between adult traditions and youth expectations. Many youth do not speak the native language. There are too few youth to justify building a new school.
- Restricted lands prevent effective land use—Developing land as specified in the CLUP is difficult dud to bureaucracy and complacency. Grazing permit holders are resistant.
- Limited funding—Funding is limited and difficult to obtain. Chapters compete for funding, and more experienced or successful chapters tend to get funds.
- Unavailable data on former Bennett freeze area victims—The post-freeze process and discrepancies during the freeze are unclear to the Chapter.

8.15 Strategic Directions

Following are strategic directions outlined by the Chapter to achieve goals, as outlined in the Tonalea CLUP (WHP 2008i, pg. 3-4–3-5):

- Reforming the education system—A new public school with encouraged enrollment.
- Empowering and engaging community involvement—Job training with community input.
- Analyzing and initiating for compensation for victims of FBFA—Policy for bringing back displaced victims and compensation.
- Advocating, positioning, and dynamic visionary leader—A victim committee with leader.
- Engaging and enhancing youth involvement—A youth representative and organization.
- Redirecting utilities to FBFA—Flexible plan for utility development.
- Modifying and mandating land management regulations—Less restrictive grazing polices.
- Launching professional services and development—Contracting professional services for development.

8.16 Development Principles

The following principles should guide development:

- Sustainable construction should be required for all new buildings.
- New housing and commercial developments should be built near necessary resources.
- New developments should not harm the natural environment or negatively impact traditional ways of life.
- Fencing around homes and cornfields will help keep cattle away from property that is easily damaged.
- Creating jobs and improving the educational system and facilities to encourage younger generations from leaving and encouraging them to return.

8.17 Community Needs Assessment

The community needs assessment includes resource needs, identification of specific actions, and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

Community Resource Needs were identified and divided into the following areas (WHP 2008i, pg. 3-7–3-10)

- Infrastructure and utility needs, including cellular communications, water tanks and windmills, water storage, safe drinking water, and reliable power sources (on and off grid)
- Transportation needs, mainly improved roads but possible an airstrip
- Housing needs, including improving existing homes and quality new homes of a variety of types and locations (e.g., scattered and clustered)
- Health and public safety needs, including faster emergency response time, closer emergency facilities, and physical addresses for homes

- Community facilities, parks, and recreation needs, including senior centers, child facilities, community centers, recreational facilities, and an improved chapter house
- Economic development needs, based on a diverse economy with multiple job and educational opportunities
- Education needs, including a middle and high school,
- Open space, areas of avoidance, and grazing needs, mainly improved range and farm management

8.18 Priority Capital Improvement Projects

Appendix Table G-2. The following represent the Chapter's preferred projects:

Priority	Actions
1	New Housing for Everyone—regardless of race, age, gender, employed, unemployed—compensate us for 50+ years
2	Health Care—Nursing Home
3	Dental & Health Clinic
4	Rebuild existing homes—Community Facilities
5	Supermarket
6	Auto Shop
7	Veterans center
8	Bigger Laundromat
9	Job Corps Office
10	Bank

8.19 Proposed Infrastructure Projects

Feasibility studies will be conducted for any proposed improvement project being considered. The project will be included in the current year's Capital Improvements Plan for consideration. Infrastructure projects will be coordinated with tribal and federal plans. Public facilities will be based on those approved in the CLUP unless amendments are made.

8.20 Priority Project Phasing

Following is the phasing plans of projects by priority.

8.20.1 Phase 1 Projects: 1–5 Years

- New Home for Everyone
- Rebuilt house and Hogan for existing homes

- Housing for veterans
- Retrofit for solar, wind energy, utilities
- All utilities hooked up to housing
- Rehab housing for handicapped
- Furniture for all housing
- Develop a master plan for utilities and infrastructure to develop land
- Utilities extension—6 phases
- Power line construction—Phase 6
- Waterline extensions
- Telephone Line extension—White Mesa included
- Individual Project Participation—S and SW of Wildcat Peak Area
- Nursing Home
- On-line educational courses—community college, etc.
- Adult Education—daycare center, preschool
- Public Library
- New School Building or addition
- Tourism Center
- Build Business building infrastructure for local people to lease: auto shop/repair, tire shop, car wash. Grocery stores, laundromat, barber shop, fast food, restaurant
- Develop recreation areas
- Gravel pit
- Farming/agricultural/irrigation development
- Pave roads: N211, N212, N213
- Traffic light at intersection Hwy 160 and N21
- 55 MPH signs before 45 mph signs
- Job Corps office
- Police Station/jail
- Fire station
- Juvenile Detention center
- Daycare
- Child Protective Services
- Safety training/community emergency response team/drivers education
- Certify land use plan
- Land use plan components—reserve sacred sites, preserve historical landmarks
- Bury utilities in open spaces, plan water use and conservation
- Fund/develop range management plan

8.20.2 Phase 2 Projects: 5–10 Years

- Health clinic
- Centenarian clinic/Dog Pound/humane shelter
- Recreation Center
- High School
- WIC Office
- Super market
- Art & Crafts center
- Visitor Center
- Convention Center
- Industry
- Veteran Center
- Exploration for natural resources: gas, oil, etc.

8.20.3 Phase 3 Projects: 10–15 Years

- Signage
- Transit System between Red Lake, Tuba City, Page, and Flagstaff
- Community bank
- Limit light pollution in open spaces

8.21 Preferred Development Sites

The following are the community's preferred development sites, including locations, size, and potential issues:

Site 1—Along Navajo Route 21, about ½ mile from Highway 160, north of the existing NHA site. About 49 acres. No drainages but natural depression may pool water. Accessible. Already has access to water and wastewater. Has all needed infrastructure.

Site 2—In White Mesa community along Navajo Route 21, on the southwest corner of Navajo Route 213. 97 acres. No drainages but one about 300 feet to northwest. Accessible. Indian Health Services can connect site to water but not wastewater.

Site 3—In Cow Springs community west of NHA subdivision. 20 acres. About 2,500 feet from Highway 160 via dirt road. Flatt topography. No drainages, but some to east and west. Less accessible than Sites 1 and 2. Already has access to water and wastewater.

9. Tuba City Chapter

This Chapter includes the community of Tuba City. It is bordered by the Tonalea, Kaibito, Coppermine, Bodaway, and Coalmine Mesa Chapters, Navajo Nation. It is also bordered by the Hopi and San Juan Paiute Indian Tribes. One hundred percent of the Chapter's 13,440 acres is within the FBFA. The community portion of Tuba City was classified as an administrative area and was exempt from the development and rehabilitation restrictions of the Bennett Freeze (WHP 2008j, pg. 1-5).

9.1 Tuba City Chapter Physical Setting

Known as To'Nanees'Dizi, (meaning scattered or tangled water), the Tuba City Chapter is located in Coconino County, AZ. Tuba City itself is located not far off U.S. Highway 89 on U.S. Highway 160, near the junction of these two highways. Nearby attractions include Grand Canyon to the west. Tuba City is crossed by two different time zones.

9.2 Tuba City Chapter Land Status

The Chapter consists of one community, while the majority of the Chapter is open space used for grazing (WHP 2008j, pg. 2-33–34). The Chapter is within Grazing District 3 Range Unit 2, which is within the Tuba City Western Agency. The Chapter is comprised of trust land with no private holdings.

9.3 Tuba City Chapter Land Use

Approximately 95 percent of the Chapter's land use is dominated by cattle and sheep grazing (WHP 2008j, pg. 2-33). There are perhaps 100 permittees currently. Overgrazing has affected the land in many areas due to lack of management plants, regulation, and enforcement. Soil erosion and changes in vegetation composition have resulted. Other impacts include damage to cultural and home sites.

9.4 Tuba City Chapter Population and Housing

The Chapter had a population of roughly 8,700 as of the 2000 census (WHP 2008j, pg. 2-3). The 2010 US Census lists the Chapter all-race population as 9,265 individuals (Navajo Division of Health and Navajo Epidemiology Center 2013). The population for 2020 is estimated to be around 12,000 (WHP 2008j, pg. 2-3).

The Chapter is one of the more urbanized areas on Navajo Nation due to Tuba City. There were 2,644 housing units as of around 2008 (WHP 2008j, pg. 2-10). Homes vary among detached homes and mobile homes. A 2006 survey found that 44% of tribal members live on a homesite lease, 19% in modular homes, and 18% in subdivisions. The majority of homes are heated from portable petroleum and wood. Roughly 25% of homes do not have plumbing (WHP 2008j, pg. 2-12). The Chapter has identified four areas for future housing development. These areas would likely consist of clustered housing, which tends

to appeal more to younger people. WHP Inc., found in 2008 that 22% of homes in the Chapter are in poor to very poor condition, and 8% in good to very good condition (WHP 2008j, pg. 2-14).

The Navajo Housing Authority, working under the Native American Housing Assistance and Self Determination Act, works to construct affordable housing for low-income families (WHP 2008a, pg. 73). The Housing Authority also works to increase and plan community development in sustainable ways including job training, substance abuse prevention, and local employment, among others.

The Community Housing and Infrastructure Department oversees the Navajo Housing Authority and also works toward community development. The Department works with government agencies, outside utilities, the private sector, and nonprofits toward housing and community development. There are over 15 government and private sector housing assistance programs (mostly loans and grants) available to the Tribe and Native Americans (WHP 2008a, pg. 280–284).

9.5 Tuba City Chapter Government and Utility Infrastructure

The Chapters are the local government on Navajo Nation, similar to county governments in some states. The Local Governance Act was passed in 1996 to give more power to Chapter governments (WHP 2008a, pg. 57). The Navajo Nation Council maintains ultimate authority on most matters. The three steps outlined in the Act Chapters must follow for increased local authority are: (1) creating and adopting a community land-use plan (CLUP); (2) implementing a five-step system of financial accountability and management; and (3) becoming certified. Each Chapter consists of three elected officials: President, Vice President, and Secretary/Treasurer.

Tuba City is a certified Chapter under the Local Governance Act. The Chapter has modified its government from that of the traditional chapter governance. The Chapter has the same elected officials as described above but also has the Council of Nat'aa, with up to six Council members. There is also an appointed Atsilasdai Executive (Chapter Services Coordinator; WHP 2008a pg. 57–58).

The Navajo Tribal Utility Authority (NTUA), a nonprofit corporation, oversees most utilities on Navajo Nation, including water, natural gas, and electricity. NTUA administers water and wastewater under the auspices of Indian Health Services. NTUA is overseen by a management board under the Navajo Nation Economic Development Committee. Utility prices are determined by an operating tariff set by the management board. Rates are set reservation-wide. The criteria for wastewater services and residences include existing plumbing systems and proximity to a main sewer line (WHP 2008a, pg. 75–76).

NTUA purchases power from multiple power companies and does not produce its own commercial power. NTUA builds and maintains transmission and power lines across the Nation (WHP 2008a, pg. 80). NTUA has the goal of providing power to all residences on the Reservation, but this is difficult largely due to the expanse of land area and scattered residences, often miles from the nearest power line tie-in. To a lesser extent, NTUA installs solar and wind power structures for electrical power generation at residences. NTUA purchases natural gas from outside the Nation. Propane is purchased from private companies.

The Navajo Nation Telecommunications Regulatory Commission manages telephone services, including cellular. NTUA is in the process of designing a fiber optics system that will increase internet access across the Nation. Frontier Communications provides business and residential services for satellite and cable television, land-line telephone, and internet. It leases tower spaces to private cellular companies. There are various options for cell phone providers for locals. Wireless internet is available at the Tuba City Chapter House.

Transportation is managed by the Navajo Department of Transportation (NDOT). NDOT is under the Division of Community and Development, which is under the Transportation and Community Development Committee (TCDC) of the Navajo Nation Council (WHP 2008a, pg. 85). NDOT helps manage the airport in Tuba City. The Navajo Indian Reservation Roads (IRR) Program is administered by the BIA Navajo Area Branch of Roads. Indian Reservation Roads are public roads providing access to various parts of the Reservation. Arizona Department of Transportation (ADOT) manages U.S. Highways and State roads, including the two U.S. Highways in the Tuba City Chapter.

Water in the Tuba City Chapter is distributed by a municipal water supply; however, many residences rely on hauling water or cistern storage. Many people rely on water from windmills, which is often unsafe for human consumption.

9.6 Tuba City Chapter Environmental Safety Status

The Chapter suffers from past uranium mining, resulting in contaminated water and health problems (WHP 2008j, pg. 1-5). Abandoned septic tanks and water quality are also problematic in remote areas.

9.7 Tuba City Chapter Water

9.7.1 Surface Water

Surface water in the area is predominately from ephemeral flow in arroyos and canyons resulting from rain and snowmelt runoff. Natural springs occur in places, but these do not create perennial streams. Surface water may be captured in small impoundments for livestock. The Chapter is located within the Moenkopi Wash Subbasin, Little Colorado Basin, Subregion, and Region.

9.7.2 Ground Water

The Tuba City Chapter is underlain by the N-aquifer. This aquifer is estimated to store 290 million acre-feet of water, and has some of the better quality water of all the aquifers on the Nation (WHP 2008a, pg. 33). However, approximately groundwater 1.5 and 3 billion gallons in
the N-aquifer are reported to be contaminated from past Uranium mining (WHP 2008a, pg. 45).

9.7.3 Wetlands and Floodplains

Floodplains in the Tuba City Chapter are currently classified by FEMA as Areas of Undetermined Flood Hazard. Most potential flooding would occur along washes during unusually high water caused by flash floods or prolonged heavy rains. Some areas, such as greasewood habitats, may commonly pool water during and after storms.

Natural wetlands are rare in the area. Wetlands may have been created from wastewater disposal in some areas or below reservoirs or impoundments. Areas within the Chapter mapped by the National Wetlands Inventory include Greasewood Lake (mapped as a lake), and ponds and small wetlands in and around Tuba City, all likely human made. Other small wetlands and riparian areas are mapped along Moenkopi Wash and several natural springs east of Hamblin Wash.

9.7.4 Water Rights

The Water Management Branch of the Department of the Water Resources, under the Division of Natural Resources, oversees water on Navajo Nation. The Water Code Administration, part of the Water Management Branch, regulates water on Navajo Nation. It is responsible for implementation of the Navajo Nation Water Code, administers well drilling and water-use permits, resolves water use disputes, and generates revenue for the use of water for construction, industrial, government, and commercial purposes. The Navajo Nation EPA oversees surface and groundwater quality and issues 401 certifications under the Clean Water Act for impacts on Tribal Trust lands. The Navajo Nation EPA is in charge of public water system regulation through inspection, monitoring, and enforcement.

9.7.5 Chapter Water Needs

Water storage, transportation, and disposal are under developed across much of the Chapter. Many sources of water may be suitable for livestock but do not meet water quality standards for human consumption. Many homes are not connected to municipal water, and due to their distance from waterlines, this is unlikely to happen in the near future. The installation of additional watering points is one option. This will decrease the distance many residences would need to haul water. Septic systems are in need of improvement and/or maintenance in many areas. As with many places in the Southwest, major water supply projects and infrastructure designed to transport water from other, reliable and sustainable sources are needed for high levels of urban or agricultural development in the Chapter.

9.8 Tuba City Chapter Agricultural Resources

Agriculture in the Chapter is mainly restricted to livestock raising and ranching. Sheep and cattle are the main livestock raised, although some people also keep horses for transportation and ranching. Grazing permits are required for livestock; BIA sets stocking rates. Jobs classified as agriculture, which are lumped with mining, comprise less than 3% of total jobs in the Chapter (WHP 2008j, pg. 2-21). Farming occurs at small scales and is rarely commercial large scale, being limited by a lack of perennial surface water.

9.9 Tuba City Chapter Soils

The Natural Resource Conservation Service (NRCS) has completed a soil inventory of the Chapter. The Chapter contains approximately 26 mapped soils units (NRCS 2013). Six of these soil units comprise the majority of soils in the Chapter. These are: Arches–Rock outcrop–Mido complex, two to fifteen percent slopes; Mespun–Councelor–Mespun, limy substratum complex, zero to ten percent slopes; Santrick–Nalcase–Rock outcrop complex, one to fifteen percent slopes; Sheppard–Psammaquents–Rock outcrop complex, zero to eight percent slopes; Sheppard–Rock outcrop–Sheppard, moderately deep complex, two to fifteen percent slopes; and Tuba–Tyende family–Fajada family complex, two to fifteen percent slopes. The dominant geology in the area is from the Glen Canyon Group, consisting of Navajo Sandstone, Kayenta and Moenave Formations, and Wingate Sandstone.

9.10 Tuba City Chapter Biological Resources

9.10.1 Threatened and Endangered Species and Resource Protection Zones

The Chapter contains all four ranked sensitivity areas classified in the Navajo Biological Resource Land Clearance Policies and Procedures (RCP). Area 3 (low sensitivity) covers the most area, followed by Area 1 (high sensitivity), then Areas 2 and 4 (moderate and developed community). There are no designated critical habitats for federally listed species protected under the Endangered Species Act (ESA) in the Chapter.

There are at least 12 species listed on the Navajo Nation Endangered Species list either occurring or with potential to occur in the Chapter. Species that are also protected under the ESA include black-footed ferret, Southwestern Willow Flycatcher, Welsh's milkweed, and Kanab ambersnail. Most native birds occurring in the Chapter are protected under the Migratory Bird Treaty Act; Bald and Golden Eagles are protected under their own federal law. Navajo Nation provides additional special protection for raptors.

9.11 Tuba City Chapter Mineral Resources

Uranium was the dominant mined mineral in the area through the nuclear boom in the 20th Century. The Navajo Abandoned Mine Lands (AML) Reclamation Department is tasked, with aid from the U.S. Department of Energy, in cleaning up hundreds to thousands of abandoned mines across the Nation.

Large-scale coal mining occurs outside the Chapter to the east on the Black Mesa/Kayenta mining complexes. Oil and gas exploration is increasing on parts of Navajo Nation with the expanse of hydraulic fracturing technology, but the Chapter has yet to a boom as has occurred in New Mexico portions of the Reservation.

9.12 Tuba City Chapter Cultural and Traditional Resources

Sensitive cultural areas include historic sites, such as old home sites, and prehistoric sites. Areas of Avoidance area also protected. These include areas used for gathering plants and materials used for traditional purposes. Specific locations of known sites are not available to the public. Many areas on the Nation are not inventoried for cultural resources until the area is within the footprint of a planned project or development. Cultural resources are overseen by the Navajo Nation Historic Preservation Department, which keeps records of documented sites.

9.13 The Development Plan

The following sections outline the Tuba City Development Plan (WHP 2008j, pg. 3-1–3-22).

9.14 Chapter Vision

The Chapter Vision involves maximizing the benefits of modern opportunities while maintaining the integrity of traditional Navajo culture. The vision is best summed up as:

"The TóNanees'Dizi Chapter shall be a chapter with both an urban and rural diversity. The rural area will continue to accommodate farming and the traditional Navajo way of life. The administrative area will be a community which is home to commercial activity and denser residential development. The community will have an approved land use plan which identifies the road network and delineates commercial and residential land uses. All residents of the Chapter, be they Dine or non-chapter members, will have access to safe and affordable housing and all basic infrastructures" (WHP 2008j, pg. 3-1).

9.15 Chapter Goals

Goals outlined in the Tuba City CLUP (WHP 2008j, pg. 3-1–3-2) to reach the Chapter vision include:

- Access to safe and adequate housing
- A range of housing options that match all income ranges and location preferences
- Elderly and disabled resident access to independent living centers
- Education opportunities for students of all ages
- Improved quality of life through economic development; retail and recreational opportunities for tourists
- Adequate public safety, including fire and police protection, for all residences
- A stable government that will work to improve the community and increase public participation
- Saving and protecting the environment, as this is a central concern for the community

9.16 Development Issues

The following outline the principal development issues for the Chapter, as specified in the Tuba City CLUP (WHP 2008j, pg. 3-3–3-4):

- Lengthy and cumbersome bureaucratic protocols
- No accountability to FBFA residents and Chapters
- Political contradictions and interferences
- Limited and restrictive resources
- Incomplete integration of technology
- Conflicting laws and mandates
- Diversity in culture and language
- Undervalued input and acknowledgement of FBFA residents

9.17 Strategic Directions

Following are strategic directions outlined by the Chapter to achieve goals, as outlined in the Tuba City CLUP (WHP 2008j, pg. 3-4–3-6):

- Implementing financial management plan—This will aid in transparency and put more money in the Chapter's control rather than the Navajo Nation Counsel.
- Implementing community-based land use plan—Strategic planning to empower local government.
- Strengthening governance through local empowerment—Putting more power in the Chapter's hands and removing dependency on the Navajo Nation Counsel.
- Involving impacted communities—A clear line of involvement and communication among FBFA communities, Navajo Nation, and the federal government.
- Using and integrating technology—For example, improved internet access.
- Establishing partnerships to address FBFA recovery—R residents do not trust their concerns will addressed by the Navajo Nation departments in charge of managing FBFA recovery. The number of intermediary departments and deal should be reduced, and one agency should be in charge of recovery.
- Preserving language and culture—Increasing use of native languages and encouraging cross-cultural sharing, especially with young people.
- Creating awareness through outreach and marketing—Informing, updating, and educating the public though continued outreach and public meetings.

9.18 Development Principles

The following principles should guide development:

- The Chapter should provide for people's basic needs such as power and water.
- The Chapter needs to plan for improving the overall health of its members.
- Public safety and emergency medical service need to be improved to better respond to emergency situations.
- The Chapter should commit to creating a stable and independent economy.
- New developments should not harm the natural environment or negatively impact traditional ways of life, including cultural resources.
- The Chapter needs to plan for jobs for the large and growing young population.

9.19 Community Needs Assessment

The community needs assessment is based on information provided by the community during community workshops in 2008 and by professional field assessments completed by WHPacific, Inc., in 2008 (WHP 2008j, pg. 3-6).

The community needs assessment includes resource needs, identification of specific actions, and projects that need to be implemented in the FBFA, project phases by timeline, and preferred development sites within the Chapter.

Community Resource Needs were identified and divided into the following areas;

- Infrastructure/utilities, including Power lines, waterlines, a wastewater treatment facility, and a solid waste collection infrastructure, cellular communications, and waste management
- Transportation, including road improvements, public transportation, and bike lanes
- Housing, including a diversity of housing types and communities, and repair of existing properties
- Health and public safety, including decreased emergency response time, physical home addresses, and access to pharmacies
- Community facilities, including parks, recreation areas, day care, community centers, updated rodeo and fair grounds, libraries, and computer labs
- Economic development, including employment opportunities, tourism industry, increased Native-owned business, and agriculture improvements
- Education, including life-long learning centers, vocational training, and four-year university
- Open Space, areas of avoidance, and grazing, including uranium mining cleanup and range management

9.20 Actions

9.20.1 Priority Capital Improvement Projects

Appendix Table G-3. The following represent the Chapter's preferred projects:

Priority	Action
1	New hospital w/trauma center and nursing home
2	Home ownership
3	Road improvement
3	NTUA/ APS—Rare Metal power line project
3	Install water and sewer lines along Hwy 160 to Hwy 89/ Main community area
3	New public safety and detention center—engineering, design plans, infrastructure & construction
3	Upgrade Fair/ Rodeo grounds, including bathrooms
4	Wal-Mart
4	Daycare for working families (in Admin area)
5	Adult education facility—university, vocation, technical and job corps
6	Relocated Navajo Housing Services
6	Public transit system—Bus route
7	Farmer's market
7	Tourist center
7	Kerley Valley construction
7	Bus route along name routes to be paved and maintained—same as road improve projects
7	Nursing home
8	Treatment/ Detox center
8	Waste water treatment plan (upgrade/expand the Kerley Valley w/treatment plan)
8	Feasibility study for Wind farm (location & operation)
8	Casino/ Bingo hall
8	One-stop shop for tribal programs
8	Pave Moenave Road

Priority	Action
8	Main Street construction
8	Chapter Voter Boundary assessment
9	Animal shelter—expand and upgrade
9	Cemetery— community & veterans
9	Pave To NaneesDizi local government parking lot
9	Memorial marker remembering our leaders
9	Livestock control facility—impound lot, livestock management office
9	Range management plan—determine units
9	New shopping mall
9	Withdraw commercial and business zone along Hwy 160 (100 acres)
9	Feasibility study for ATV and quad track
9	Rural/911 addressing
9	Power line extension—Moenave phase 6 (33 homes/ Rare Metal)
9	Solar energy for remote homes
9	Pharmacy
9	Veterinarian

9.21 Proposed Infrastructure Projects

Feasibility studies will be conducted for any proposed improvement project being considered. The project will be included in the current year's Capital Improvements Plan for consideration. Infrastructure projects will be coordinated with tribal and federal plans. Public facilities will be based on those approved in the CLUP unless amendments are made.

9.22 Priority Project Phasing

Following is the phasing plans of projects by priority.

9.22.1 Phase 1 Projects: 1–5 Years

9.22.1.1 Economic Development

- Withdraw commercial and business zone along Hwy 160 (100 acres)
- Funds for future business infrastructure

- Convention and Conference Resort Center
- Commercial development—247 acres (including sub-division)—need for clothing stores, fine dining, grocery, coffee shop, and spa
- Relocate the ToNaneesDizi Indian Market
- Kerley Valley commercial & industrial site- infrastructure (water, waste, waterlines, and site prep)
- Rehab businesses for handicap accessibility

9.22.1.2 Public Safety

- New public safety and detention center—engineering, design plans, infrastructure and construction
- Rural/911 addressing
- Demolish existing Navajo Nation Tuba City Police department and Adult Detention Center
- Sub-police station
- Fire station at Moenave
- Sub-Emergency Medical Services

9.22.1.3 Health

- New hospital w/trauma center and nursing home
- Treatment/Detox center
- Pharmacy
- Veterinarian
- Emergency management center/office

9.22.1.4 Community Facilities

- Nursing home
- Chapter voter boundary assessment
- Animal shelter—expand and upgrade
- Cemetery—community and veterans
- Pave To'Nanees'Dizi local government parking lot
- Memorial marker remembering our leaders
- Livestock control facility – impound lot, livestock management office
- Animal boarding and veterinarian clinic
- One-stop shop for Navajo Nation programs
- Veterans' parking lot (some design completed)
- Women's shelter

9.22.1.5 Infrastructure Utilities

- Road improvement
- NTUA/APS—Rare Metal power line project

- Install water and sewer lines along Hwy 160 to Hwy 189/Main community area
- Waste water treatment plan (upgrade/expand the Kerley Valley with treatment plant)
- Power line extension—Moenave Phase 6 (33 homes/Rare Metal)
- Solar energy for remote homes

9.22.1.6 Transportation

- Public transit system – bus route
- Kerley Valley road construction
- Pave Moenave Road
- Street posting and lighting
- Carpool/taxi
- Colorado Street construction

9.22.1.7 Open Space, Cultural Sites, and Grazing

- Plant-a-tree program—wind control (SW Tuba and along Main Street)
- 100% uranium cleanup

9.22.1.8 Housing

- Homeownership
- Relocate Navajo Housing Services
- FBFA recovery infrastructure housing program—construction & wiring
- Apartment complex
- Subdivision housing 247 acres (including business)
- Habitat for Humanity
- Apartments for doctors and nurses
- Student housing

9.22.1.9 Education

- Daycare for working families (Admin area)
- Adult education facility—university, vocational, technical school and job corps (Admin area)
- Bus route along named routes (Paved & Maintained)—same as road improvement projects
- Retention fund for quality teachers, principals, board members and superintendents

9.22.1.10 Parks & Recreation

- Upgrade Fair/Rodeo grounds, including bathroom
- Dinosaur track tourist attraction (West Tuba)
- 4-H Club
- Relocate auction yard to rodeo grounds
- Bicycle trail (along Main Street/Hwy 160)
- Community baseball/softball field
- Boys & Girls facility

- New community and recreational center

9.22.2 Phase 2 Projects: 5–10 Years

9.22.2.1 Transportation

- Main Street construction
- Bike lane

9.22.2.2 Open Space, Cultural Sites, and Grazing

- Range management plan – determine units

9.22.2.3 Parks & Recreation

- RV park and campground (Kerley Valley at Auction Yard)
- Feasibility study for hiking and horseback riding trail location and operation

9.22.3 Phase 3 Projects: 10–15 Years

9.22.3.1 Community Facilities

- Renovate T'Nanees'Dizi Local Government meeting hall
- Infrastructure utilities
- Feasibility study for Wind Farm—location and operation
- Capture methane gas at Landfill for alternative fuel (SW Tuba)

9.22.3.2 Transportation

- Build bridge over highly used streets
- Hybrid transportation
- Railroad station

9.22.3.3 Parks & Recreation

- Feasibility study for ATV and quad track
- Feasibility study for fish hatchery farm
- Feasibility study for hiking and horseback riding trail location and operation
- Feasibility study for golf course with bingo hall
- Community swimming pool and aquatic center
- Health club