SUMMARY

INTRODUCTION

Diné Power Authority (DPA), a Navajo Nation enterprise, proposes to construct, operate, and maintain a 500 kilovolt (kV) transmission line planned to deliver electric power from the Four Corners area in northwestern New Mexico across northern Arizona to a terminus in southeastern Nevada. The proposed project, the Navajo Transmission Project (NTP), is currently planned to be in service in the year 2001 and operate for about 50 years.

The preparation of an environmental impact statement (EIS) is required because of Federal government involvement, which includes (1) granting rights-of-way across Federal and tribal lands and (2) certain participation by Western Area Power Administration (Western), and agency of the U.S. Department of Energy (DOE). In accordance the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR 1500-1508), DOE implementing regulations, and other applicable regulations, Western prepared this draft EIS (DEIS) to document the analysis of the potential effects that the proposed project could have on the natural, human, and cultural resources in the project area. Western is serving as the lead Federal agency under whose direction the EIS is being prepared.

The following sections provide summary descriptions of the purpose and need for the proposed project; alternatives considered including the proposed project; alternative routes including the environmentally preferred; affected environment; environmental consequences; and scoping, consultation, and coordination.

PURPOSE AND NEED

For more than a decade, regional electrical transmission systems have become increasingly stressed by the lack of adequate bulk transmission capacity west from the Four Corners area in northwestern New Mexico. Several thousand megawatts of power generation was added in the Rocky Mountains/Four Corners/Desert Southwest (RM/FC/DS) region in the 1970s and 1980s, but no new transmission lines have been constructed west from the Four Corners area since 1970. Although a number of projects have been planned, lack of approved rights-of-way across the Navajo Indian Reservation has precluded completion of any of the projects.

Considering this need for transmission of power west from the Four Corners area, DPA is pursuing the opportunity to develop an extra-high-voltage transmission line from the Shiprock Substation in northwestern New Mexico to the Mead Substation or the Marketplace Substation in southeastern Nevada. DPA was established as an enterprise by the Navajo Nation Council to promote the Navajo Nation's development of energy resources and new sources of transmission capacity. The proposed NTP is an opportunity of the Navajo Nation to own a transmission line that would be an integral part of a regional electrical transmission system in the western United States.

As the project is currently envisioned, revenue would be generated by leasing the capacity of the transmission line to regional utilities. Annual revenues over the life of the project would provide funds to allow the Navajo Nation to improve its economic condition and allow for investment in other long-range productive business opportunities. NTP is one project of a broader effort of the Navajo Nation to promote development to create a viable economy that provides for a decent standard of living, services, and jobs for the Navajo people.

The purposes and needs for the proposed project are described below.

Relieve the constraints on the transmission of electricity west from the Four Corners area to the Desert Southwest Currently, more energy can be imported from the north on existing transmission lines into the Four Corners area than is capable of being exported with existing transmission capacity to the west. The existing system is fully committed to transmitting energy from the Four Corners area and is generally heavily loaded, causing the amount of power scheduled across any one line to be periodically cut back to keep flows within established line limits. This transmission "bottleneck" essentially precludes economic sales of electricity to markets in south-central Arizona, Nevada, and southern California for which an estimate of future load growth is more than 10,000 megawatts (MW) during the next 10 years. A project with the characteristics of NTP would play an integral role in meeting a portion of this projected load growth.

Improve operational flexibility and reliability of the extra-high-voltage transmission system in the event of an outage of a parallel transmission system and, therefore, improve the overall system reliability in the RM/FC/DS region The extra-high-voltage transmission system west of Four Corners consists of one 500kV and two 345kV transmission lines. Under extreme operating conditions, there is a potential for the 500kV line to fail, an event that would automatically route the power to the 345kV lines and potentially cause an overload on the two 345 kV lines. The system could then exceed maximum limits for power flow, which would cause the power generators to slow down or shut off to avoid overloading and damaging the generators and the 345kV lines. NTP would provide additional capacity to support the system. Also, NTP would help enhance the existing transmission system grid in the western United States and contribute to increased reliability, efficiency, and capability, especially in the RM/FC/DS region.

Allow increased economical power transfers, sales, and purchases in the RM/FC/DS region Removing the existing transmission restriction, utilities in the area would be able to support their peak load periods by importing power from existing hydro and coal-fired generation in the Rocky Mountain area. Such economic purchases reduce the use of more expensive generation. NTP would improve the operational flexibility of area generation facilities and take advantage of economic and seasonal diversity in the electrical power market. When lower cost surplus power is available to the north and east of Four Corners, it could be "wheeled" across NTP to customers west and south of Four Corners, providing a sales benefit to the provider and a benefit to the purchasing utility ultimately resulting in lower rates to the customers.

Improve economic conditions of the Navajo Nation The Navajo Nation, the second largest American Indian tribe in the United States, is economically disadvantaged according to U. S. government statistics. Economic indicators suggest an absence of a strong and diverse economic base within the Navajo Nation.

Since the Economic Recovery Act of 1981 and later Gramm-Rudman initiatives, there has been a substantial reduction in Federal funding to tribes, and continued decreases are anticipated. The Navajo Nation realizes that it must develop programs and projects that generate revenue for producing sustainable growth, building economic self-sufficiency, and reinvesting in further productive activities. Over the life of the project, annual revenues would provide funds for the Navajo Nation to allow for investment in other business opportunities. In addition, development of NTP would provide short-term employment for American Indians during construction in a region that has an unemployment rate of about 30 percent (on the Navajo Reservation). After construction, it is anticipated that there may be limited opportunities for long-term employment in aspects of operation and maintenance of the transmission line. Availability of electricity on Navajo Nation lands also is critical to economic growth and infrastructure development of the Navajo Nation. NTP would allow Western an alternate path for firm-power deliveries, thus reducing dependence and freeing capacity on the 230kV path for increased deliveries to the Kayenta and Long House Valley substations. That would provide the Navajo Tribal Utility Authority (NTUA) with more flexibility to plan additional distribution of electricity.

Facilitate the Navajo Nation's development of energy resources and participation in the electric utility industry The role of the Navajo Nation in the energy industry traditionally has been that of a passive resource owner. Nonrenewable resources from Navajo Nation lands are exported to provide fuel for power for much of the western United States. The economy and self-sufficiency of the Navajo Nation depend heavily on the export of these resources. However, the businesses associated with the energy activities are typically non-Navajo. NTP is an opportunity for the Navajo Nation to own a transmission line that would be an integral part of a regional electrical transmission system, thereby establishing a role in the electric utility industry.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The following discussion addresses alternatives considered but eliminated from further study and project alternatives studied in detail.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Energy conservation and electric load management The intent of this alternative is to promote regional energy conservation among consumers through load management and development of energy standards and electric equipment standards. This requires that the demand for electricity be reduced through conservation. This alternative, however, would meet only a small part of the purpose and need for the proposed project. It would forestall the increase in regional energy demands only for a short period of time, while having no effect on the transmission system constraints west of the Four Corners area or on the economic condition of the Navajo Nation. Also, it is anticipated that the relief on energy demands brought about by this alternative would be minimal at best because most of the market area, such as southern California and southern Nevada, already has aggressive energy conservation and load management programs in place.

New generation facilities Building new generation facilities would help meet the increasing energy needs of the southwestern United States and, depending on the location of the generation project, could conceivably benefit the Navajo Nation. However, new generation facilities would not remove the transmission system constraints west of the Four Corners area and, in fact, would aggravate the situation. Not only is new transmission needed to remove existing constraints, but additional new transmission would be needed to accommodate new power generated.

Existing transmission systems Consideration was given to (1) scheduling power from the Four Corners area to major load areas via different existing transmission paths, (2) using a phase shifting transformer or transmission line compensation on existing paths, (3) using a phase shifting transformer or transmission line compensation on the existing transmission paths, and (4) upgrading Western's 230kV line. All of the electrical paths out of the Four Corners area are often scheduled to maximum capacity, meaning that there is more capacity available than can be safely scheduled out of the area. In addition, scheduling over alternate paths means a loss of revenue to other utilities who then have to find new paths, as well as absorb the increase in wheeling costs. The results of using a phase shifter or series compensation only partially mitigate the basic problem of lack of capacity available on the existing transmission system. Also, over the past several years Western has implemented upgrades to maximize the capability of its Shiprock-to-Glen Canyon 230kV line; however, the improvements were short term. This alternative has a very low benefit-to-cost ratio.

Alternative transmission technologies Alternative transmission technologies of (1) using voltage levels other than 500kV, (2) direct current (DC) versus alternative current (AC), (3) underground construction versus overland construction, and (4) use of new technologies were considered. Constructing a transmission line at other than 500kV would accomplish fewer of the benefits sought by project proponents. Adjusting the voltage level would result in either increased costs for construction (at higher voltage levels) or compromising capacity (at lower voltage levels). The key difference between DC and AC is the resulting flexibility of the system. The AC system can be interconnected to the existing electrical system more economically. Because of technical complications, economic cost, environmental impacts, and inaccessibility for maintenance, an underground system was not considered a viable alternative. Current research and development for other potential methods for bulk-power transmission of electric energy such as microwave, laser, and superconductors are not currently available for commercial use.

ALTERNATIVES STUDIED IN DETAIL

Alternatives studied in detail are no action and the proposed action, including alternative transmission line routes.

No-action alternative If no action is taken, the right-of-way for NTP would not be acquired and the transmission line would not be built. Advantages of the no-action alternative would include saving of construction costs of the new facilities and the preclusion of associated impacts on the environment. However, the needs of the project, described above, would not be met.

Proposed action As previously explained, NTP is a proposed 500kV AC transmission line from Western's Shiprock Substation west of Farmington in northwestern New Mexico to either Western's Mead Substation or the Marketplace Substation, both of which are south of Boulder City in southern Nevada. The approximate length of the line would be 400 to 500 miles depending on the alternative route selected for construction.

Figures 2-1 and 2-2 show the different types of tower structures typically used for a 500kV transmission line. The line would be supported primarily by guyed "V" steel-lattice structures, averaging 120 feet in height, spaced 1,200 to 1,500 feet apart. Other types of tower structures may be used in certain areas for engineering or economic reasons, or to mitigate environmental impacts. These other types include a guyed "delta", self-supporting steel-lattice, or steel pole. More robust structures would be used in areas of difficult terrain, areas where the span of the transmission line would be longer than normal, or where the line would angle or turn.

The right-of-way, or the strip of land over which the transmission line would cross, would be 250 feet wide. Figure 2-5 illustrates the right-of-way concept for NTP.

Ancillary facilities would include new equipment in the existing substations at the eastern and western ends of the transmission line, a new intermediate substation, and addition of equipment at an existing communication site. To supplement the existing microwave communication system, fiber optic cable may be imbedded in the overhead ground wire, and if the Red Lake site were to be chosen for the intermediate substation, a repeater (parabolic dish) would be added to an existing microwave tower on Bill Williams Mountain.

Upon selection of a route for the transmission line and prior to construction, a plan for the development and implementation of the project (a construction, operation, and maintenance plan, or COMP) would be prepared by the project proponents in coordination with by the affected regulatory and land-managing agencies. Construction of NTP would begin in late 1998 and would take about 2.5 years to complete. The life of the project is projected to be 50 years.

Typically, construction of a transmission line and associated facilities involves the following activities:

- surveying the transmission line centerline and substation sites
- identifying/upgrading or constructing temporary and long-term access roads
- clearing activities for right-of-way, tower sites, construction yards, batch plants, and substation sites
- excavating and installing foundations
- assembling and erecting towers with temporary and permanent pad sites
- installing substation equipment
- clearing of pulling, tensioning, and splicing sites
- stringing conductors and ground wires
- installing counterpoise (tower grounds) where needed
- cleaning up and reclaiming affected land areas

ALTERNATIVE ROUTES

A number of alternative routes for the proposed transmission line were identified, studied, and compared. The objective was to identify an environmentally preferred route. Substation sites and other ancillary facilities were studied as well. The substation site(s) selected for such facilities would depend on the final route selected for the transmission line.

PROCESS

The process used to compare the routes included the following steps.

The *Regional Corridor Environmental Feasibility* was conducted to identify potential corridors feasible for constructing a transmission line. Most of these paralleled existing linear features (e.g., transmission lines, pipelines), which is preferable since the construction of a second line in an existing utility corridor is a compatible use of land, would be less intrusive, and minimize new disturbance (e.g., existing access roads can be used).

The initial corridors were refined, then reviewed by the public and relevant agencies through *Scoping,* which initiated the NEPA process. During scoping, issues and concerns were identified that could help focus the further evaluation of alternatives.

A *Resource Inventory* was then conducted for each alternative route to establish the baseline of existing environmental resources. Through scoping and the inventory, a number of environmental issues were identified that influenced the direction of the analyses. Environmental issues included the following:

- accelerated soil erosion and degradation of water quality
- effects on special status plant and wildlife species
- effects on critical habitat, habitat fragmentation, and protection of biodiversity in certain habitats
- placing a priority on paralleling existing linear features
- effects on residences, agriculture, and timber management
- proximity of the transmission line to communities
- restricting uses within or adjacent to the proposed right-of-way
- proximity to and effects on parks, preservation, and recreation areas
- effects on scenic quality
- effects on cultural resources including archeological sites, special status sites, and traditional cultural places
- effects of electric and magnetic fields on the health of humans and animals

Once data were compiled, the environmental resource data were assessed to determine the potential impacts that could result from implementing the project. During *Impact Assessment and Mitigation Planning*, initial impacts of the project on each resource were identified, measures to effectively mitigate the impacts were recommended, and residual impacts (those that remain after mitigation) were determined. Through a systematic analysis, all of the alternative routes were *Screened and Compared,*

based on potential impacts and key issues, in order to narrow the number of alternative routes and select the environmentally preferred alternative route (Figures A-2, A-3, 2-14, and 2-15).

RESULTS

For ease of comparison and presenting the results, the project area was divided into eastern and western areas. The Moenkopi Substation represents the midpoint: the endpoint of the eastern alternative routes and the beginning point of the western alternative routes. Four eastern area alternatives and six western area alternatives were carried forward for analysis in the DEIS. In the western area, three of the alternatives terminate at the Marketplace Substation and three at the Mead Substation. The alternative routes are listed below and shown on Figure 2-10.

Eastern Area Alternatives

Glen Canyon 1 (GC1)—260.6 miles
Kaibito 1 (KB1)—244.7 miles
Central 1 (C1)—186.7 miles
Central 2 (C2)—211.0 miles

Western Area Alternatives

Moenkopi to Marketplace

Northern 1 West (N1W)—217.0 miles
Northern 2 (N2)—225.1 miles
Southern 2 (S2)—247.7 miles

Moenkopi to Mead

Northern 3 (N3)—199.3 miles
Northern 4 (N4)—207.4 miles
Southern 4 (S4)—230.0 miles

These alternatives were compared and ranked based on potential impacts and key issues. In most locations, the issues and adverse impacts could be mitigated and the impacts remaining overall would be predominantly low (indiscernible-to-slight change to the environment) and some moderate (slight-to-substantial change). Only in some areas did high impacts (substantial-to-significant change) remain that could not be wholly resolved at this stage of the project. These potentially high impacts are associated with certain areas of traditional cultural places and visual resources (Figures 2-12 and 2-13).

Environmentally Preferred Alternative Routes

In the eastern portion of the project area, the environmentally preferred route is Kaibito 1 (K1), which would connect the Shiprock Substation with either the Red Mesa, Copper Mine, or Moenkopi Substation site. K1 is 244.7 miles long and parallels the Shiprock-to-Glen Canyon 230kV and the Glen Canyon-to-Pinnacle Peak 345kV transmission lines for a total of 178.8 miles (73 percent of the route). High adverse impacts on visual resources would be concentrated in the Kayenta area resulting from introduction of a

new transmission line corridor in an area of high scenic quality and potential foreground views from residences. High adverse impacts on traditional Navajo and Hopi cultural places would be minimized using K1 by avoiding the issue areas of the Chuska Valley, Chuska Mountains, and southern portion of the Black Mesa, but would result in the area of northern Black Mesa and Marsh Pass.

In the western portion of the project area, two environmentally acceptable routes were identified—Northern 1 West (N1W) and Northern 3 (N3). The two alternatives share the same route for about 152 miles of the eastern majority of the alternative and then diverge to either the Mead Substation or the Marketplace Substation. Both alternative routes parallel existing transmission lines along their entire lengths and both cross the Colorado River. N1W parallels a 500kV transmission line and connects the Moenkopi Substation site with the Marketplace Substation. Lake Mead National Recreation Area is crossed by both N1W and N3, and prefers N1W (the southern crossing of the Colorado River) because the terrain is less rugged, there is less sensitive habitat, and there is only one existing transmission line crossing the river. N3 would connect Moenkopi Substation with the Mead Substation and uses the northern crossing of the Colorado River, which is traversed by two lines. The western portion of N3 parallels the Mead-to-Liberty 345kV line and the recently constructed Mead-to-Phoenix 500kV line, the access road of which was upgraded during its construction. No high impacts would result along either of these alternatives, and both are preferred to minimize impacts on traditional cultural places.

DECISIONS TO BE MADE

The final route for the transmission line has not been selected. Following the review of the DEIS, the comments on the DEIS and proposed action received from the public and agencies will be reviewed, analyzed, and incorporated as appropriate into the final EIS (FEIS). The FEIS will be distributed to the public with a Record of Decision by the Administrator of Western. The Record of Decision will (1) state what the decision is, (2) identify all alternatives considered in reaching the decision, and (3) state whether all practical means to avoid or minimize harm from the alternative selected have been adopted, and if not, why they were not. The Administrator will ensure that the decision is consistent with sound practices and that the decision is executed as stipulated.

AFFECTED ENVIRONMENT

The character of the existing environment in the project area is summarized below.

Climate—The climate is characterized by low relative humidity, a high percentage of sunshine, and relatively large temperature ranges. Average temperatures range from the mid 40s to the low 90s in the lowest elevations and from the upper 20s to the mid 60s in the highest elevations. Average annual precipitation ranges from approximately 4.2 inches in the lowest elevations to 22.8 inches in the highest elevations.

Air Quality—Air quality in the project area is generally characteristic of rural areas with some influence from industrial areas such as the coal-fired San Juan and Four Corners generating stations. The rest of the project area is sparsely populated with little or no commercial or industrial development. One Class

I air quality area occurs in the Glen Canyon National Recreation Area. (Class I areas are afforded the highest level of protection from air quality degradation, as opposed to Class II and Class III areas.) The Glen Canyon National Recreation Area, a Class I area, is not crossed by any of the alternative routes. The remainder of the project area is Class II.

Water Resources—The project area lies within an arid region including parts of two major hydrologic regions—the Great Basin system (Nevada portion) and the Colorado River system. There are two major perennial streams within the project area—the San Juan and Colorado rivers. The study focused on identifying locations of springs, perennial streams, and 100-year floodplains.

Earth Resources—The project area includes portions of three physiographic provinces—Colorado Plateau, Transition Zone, and Basin and Range. Mineral resources of economic importance (e.g., coal, oil, natural gas, uranium) are present in the project area, seismic activity has been identified for portions of the project area in all three states, and soil erosion potentials range from slight to high or severe.

Biological Resources—The project area supports diverse biological resources. The eight major vegetation types present within the project area are habitats for a diversity of wildlife species. Approximately 473 species of wildlife occur including 95 species of mammals, 268 species of birds, 71 species of reptiles and amphibians, and 39 species of fish. Wetlands are limited, occurring at springs or in association with other permanent water bodies.

Special status plant and wildlife species, species of concern to various agencies, are known or have the potential to occur along the alternative routes. Habitat suitable to support approximately 33 special status plant and 104 special status wildlife species have been identified by land-managing agencies including Federal, state, and tribal authorities, as well as the U.S. Fish and Wildlife Service (FWS). Habitats designated as critical to support special status species, as defined by the Endangered Species Act, are the San Juan River (Colorado squawfish and razorback chub), Chuska Mountains (Mexican spotted owl), Colorado River (bonytail chub and razorback sucker), and the Nevada portion of the project area (Mojave desert tortoise). California condors are to be released in the Vermillion Cliffs west of Page, and a management area has been established in the Aubrey Valley for reintroducing a population of black-footed ferrets. Both species are designated by FWS as "nonessential, experimental" populations, which reduces the level of protection afforded them under the Endangered Species Act. The reintroduction of black-footed ferret began in March of 1996.

Paleontological Resources—Sedimentary deposits underlying the alternative routes include 51 different geologic units, of which 25 have been assigned a high paleontologic potential, meaning there is a high potential for scientifically important fossils to be located there.

Land Use—The project area is located in portions of New Mexico, Arizona, and Nevada. The land uses inventoried included jurisdictions, as well as existing uses, future uses, and parks, preservation, and recreation areas. Alternative routes cross lands that are privately owned and those administered by Federal, tribal, state, and local agencies. Federal agencies that administer lands include Bureau of Land Management (BLM), Forest Service, National Park Service (NPS), Bureau of Indian Affairs (BIA), and the Bureau of Reclamation. Also crossed are lands of three American Indian groups—Navajo, Hopi, and Hualapai. The Navajo Nation owns (fee simple) land in the Big Boquillas Ranch area and the Hualapai

own (fee simple) property near their reservation (Robinson Ranch area), both of which are crossed by alternative routes. The state of Arizona administers and owns land that could be crossed by NTP alternatives. No state lands were identified along the alternative routes in New Mexico or Nevada.

Existing land uses in the project area include residential, agriculture, timber, rangeland for grazing, and mining. Residences are dispersed throughout the project area with a greater number of residences located adjacent to alternative routes in the eastern portion of the project area. There is one area of irrigated agriculture crossed near the San Juan River in New Mexico. Timber management areas are in the Chuska Mountains, Defiance Plateau, and Kaibab National Forest. Livestock graze throughout the project area. Numerous individual, small mining claims are dispersed in areas along the alternative routes particularly in the western portion of the project area. Also, the project area is traversed by numerous highways, roads, and linear utilities. The majority of NTP alternative routes parallel existing utility corridors. Generally, the Federal agency management plans and community plans reviewed indicate that the agencies and communities will continue to manage their respective areas for the rural, open space character, allowing for compatible uses.

Socioeconomics—The socioeconomic study addressed baseline economic conditions for each of seven counties crossed by NTP alternative routes in three states. The seven counties included an aggregate population of about 1.3 million in 1990 and projections indicate an increase to 1.8 million by the year 2000. The American Indian population in the project area was about 166,000 in 1990, including 155,276 Navajo reservation residents, people living on the Hopi and Hualapai reservations, and the San Juan Southern Paiutes. Economic indicators (income, employment, dependency, and household size) show that San Juan County, New Mexico, and Apache and Navajo counties in Arizona have relatively high levels of economic dependency and distress compared to other counties in the region. Clark County, Nevada, and Yavapai and Mohave counties, Arizona have substantially higher levels of employment, income, housing value, and educational attainment. Coconino County indicators fall in between the two.

Visual Resources—The project area includes a diverse range of largely undeveloped vistas and open landscapes interspersed with small communities and rural towns. Landscapes are dominated by the distinctive features and landforms of the Colorado Plateau and Basin and Range physiographic provinces. The scenic quality of the large majority of the landscapes crossed by the alternative routes is minimal or average. Lands of outstanding or distinctive scenery accounted for about nine percent of the alternative routes.

Cultural Resources—Archaeological and historical sites are abundant throughout the project area, but little of the project area has been intensively inventoried. About 280 previously recorded archaeological and historical sites were identified, within a 0.5-mile-wide corridor, along all the alternative routes. About 15 percent of these are in New Mexico, 81 percent in Arizona, and 4 percent in Nevada.

A total of 10 special status cultural resources were identified within a six-mile-wide corridor. Two of these are in New Mexico, seven in Arizona, and one in Nevada.

The project area encompasses the traditional territories of many American Indian groups who continue to reside in the area, and traditional cultural places along the alternative routes were addressed. Places associated with traditional religions and ceremonies, and other nonritual traditional uses are found

throughout much of the project area. Studies were conducted with the involvement of ethnographic specialists and members of the three tribes whose reservation lands would or could be crossed by the proposed transmission line—the Navajo Nation, Hopi Tribe, and Hualapai Tribe.

ENVIRONMENTAL CONSEQUENCES

NO ACTION

If no action is taken, the right-of-way for NTP would not be granted and the transmission line would not be constructed. Funds for the new facilities would not be expended and the environment would remain as it presently exists. However, the need for the project would not be met. Constraints on the transmission of electricity in the area would not be relieved; operational flexibility and reliability would not be improved; and economical power transfers, sales, and purchases in the area would not increase. The Navajo Nation would have to seek other means to attempt to improve its economic conditions and develop energy resources. Also, considering cultural and paleontological resources, this alternative would forego the opportunity to develop detailed inventories and recovery of data that might be undertaken to mitigate impacts of the proposed project.

PROPOSED ACTION

Potential environmental consequences, or impacts, that could result from the proposed project are summarized below.

Air Quality—Impacts on air quality would be short term, occurring only during construction in the form of temporary fugitive dust. Impacts on air quality are anticipated to be low.

Water Resources—Impacts on water resources would be low. Surface water resources (springs and perennial streams) would be spanned by the transmission line. No impacts on groundwater are anticipated since construction activities are not expected to reach groundwater depths.

Biological Resources—The primary concerns regarding biological resources are the effects on special status plants and wildlife species, vegetation (loss of habitat), and wildlife (particularly big game). Areas of concern include The Hogback (Mancos milkvetch and Mesa Verde cactus), Chuska Mountains (big game and biodiversity), northern Black Mesa (raptors), Aubrey Valley (black-footed ferret management area), Truxton Plain (pronghorn), Black Mountains (bighorn sheep), Eldorado Valley (desert tortoise).

Overall, residual impacts on biological resources would be low. Since the majority of the alternative routes parallel existing linear facilities (e.g., transmission lines), the need for new access roads is minimized thereby reducing the amount of vegetation loss and habitat modification. Mitigation is expected to effectively reduce impacts. Measures include carefully placing towers to avoid and/or span sensitive features, minimizing the amount of ground disturbance and loss of habitat, curtailing construction during critical seasons of the life cycles of certain species of wildlife, and restricting public access into sensitive areas (e.g., bighorn sheep and pronghorn habitat).

Residual impacts on habitats suitable for special status plant and wildlife species are anticipated to be low. The project proponents would be required to adhere to mitigation set forth in a Biological Opinion (U.S. Fish and Wildlife Service, Section 7 of the Endangered Species Act) for species listed as threatened or endangered. Also, the project proponents would coordinate with land-managing agencies to develop measures for species of concern that are not Federally listed.

Paleontological Resources—Potential impacts on paleontological resources are anticipated to be low. The inventory identified areas that have a high potential for yielding paleontological data. Areas considered by the land-managing agencies to be particularly sensitive and could not be avoided by construction activities, would be surveyed and data would be recovered prior to construction.

Land Use—The greatest potential for land use impacts appeared to be potential impacts on residences, but these were mitigable. Impacts on agriculture are expected to be low considering that towers would be judiciously placed. Impacts on timber management are predicted to be moderate in the Chuska Mountains and are low for the remaining portions of the alternative routes. Long-term impacts on grazing would be low because of the minimal amount of disturbance to rangelands and minimal displacement of animal unit months.

Impacts on future land uses would be low based on known future plans along the alternative routes and the use of existing utility corridors. Impacts on parks, preservation, and recreation areas along the alternative routes would be low primarily because the routes generally avoid these areas and follow existing utility corridors.

Socioeconomics—Employment and local purchases during construction of NTP would result in positive direct and indirect socioeconomic effects. Construction costs for NTP are estimated at $332 million (1995 dollars) based on the average length of the alternative routes. Up to 225 people would be employed during project construction; about half of the construction workforce would be hired locally, creating short-term job opportunities. The economy in the project area also would benefit from local purchases of construction materials, and goods and services such as food, lodging, concrete, and fuel. Regional economic modeling was conducted to estimate the direct and indirect economic impacts on individual counties, accounting for multiplier effects that include wages and salaries, and tax revenues. Results show that projected county output would range from $7 million in Yavapai County to $140 million in Coconino County.

Visual Resources—As mentioned, the majority of each alternative route parallels existing transmission lines. In these instances, residual impacts on visual resources would vary from low to moderate. Mitigation measures that would effectively reduce the short- and long-term visual impacts include minimizing new access roads, matching structure locations and types, and using nonspecular conductors. Where NTP would be establishing a new corridor, the construction and operation of the transmission line could result in impacts that range from moderate to high.

Cultural Resources—Impacts on archaeological and historical sites generally are rated as low to moderate throughout the project area. This is primarily a result of the ability to mitigate these impacts through detailed cultural surveys of the selected route and data recovery, where appropriate. Impacts on special status cultural resources are generally rated as low to moderate because most are relatively distant from

the alternative routes and their settings already have been affected by previous transmission lines. Impacts on traditional cultural places generally are rated as high throughout much of the project area as none of the alternative routes can avoid these high impact areas.

Electric and Magnetic Fields—The operation of the proposed transmission line was evaluated for "corona" and "field" effects. These potential effects would be similar to or less than other 500kV transmission lines in Arizona. The electric and magnetic fields produced by the NTP line at the edge of the right-of-way would be lower than limit values established by other states (Arizona, New Mexico, and Nevada have no recommended field limits for transmission lines).

Despite the finding that the magnetic fields produced by the NTP transmission line would be below the values set by states with established criteria, and that NTP would result in magnetic field exposures well below those recommended by international and national scientific organizations, additional evaluation was made of research on the potential effects of long-term exposure to magnetic fields. Reports of weak and inconsistent associations between estimated exposure to magnetic fields and human health have not been determined to reflect a causal relationship. Laboratory studies have not provided either a mechanism or experimental basis to identify hazardous effects of exposures at the levels associated with the NTP transmission line. Similarly, a review of agriculture and wildlife studies did not indicate that plants and animals would be disturbed or affected by the fields from the line. One aspect of transmission line operation considered to be of concern is the possibility of induced shock from electricity flowing through or near conductive objects (e.g., irrigation pipes or vehicle antennas). Safety education and strict adherence to the National Electric Safety Code for safe distances from conductors are recommended.

The function of some models of cardiac pacemakers or defibrillators, which are implanted in persons to regulate heartbeat, may be affected by electric fields similar to those that would be generated by NTP. However, these fields are already present along existing transmission lines that parallel 60 to 100 percent of the alternative routes. In addition, less than three percent of the devices in use could be susceptible due to design improvements, and it appears that an extremely small percentage of people in the project area would have pacemakers (or would ever come near enough to the line to feel any effects).

No significant unavoidable adverse impacts were identified for biological, earth, paleontological, land use, socioeconomic, air, or noise resources for NTP. Significant unavoidable adverse impacts on visual and traditional cultural places are shown in Table 4-18.

The DEIS addresses the potential cumulative effects of NTP as well. Cumulative effects are the aggregate impacts of an action when added to other past, present, and reasonably foreseeable future actions in the same geographic area. For NTP, the cumulative effects analysis focuses largely on other transmission lines in the area. In fact, the Federal Land Management Policy Act mandates that utility projects should be located within existing utility corridors to minimize cumulative effects. Cumulative effects are discussed by resource in Chapter 4 of the DEIS, but in summary, the majority of NTP is located along existing corridors so the cumulative effects of the project are anticipated to be very small.

The DEIS also compares short-term impacts with long-term productivity of the project. Any environmental consequences are expected to occur in the short term, meaning that the environment would not be seriously or negatively altered by the project in the long term. The majority of environmental

impacts would occur during construction-related ground disturbance. In the long term (50 years and beyond), the project is expected to expand and strengthen the regional electrical power network and to contribute to the economic growth and development of the Navajo Nation. Short-term and long-term effects are discussed more thoroughly in Chapter 4 of the DEIS.

SCOPING, CONSULTATION, AND COORDINATION

Scoping, a process open to the public and conducted early in the project, served to identify the range or scope of issues to be addressed during the environmental studies and in the EIS. Activities associated with scoping included (1) agency contacts and coordination with cooperating agencies; (2) public meetings; and (3) letter and newsletter mailings, media releases, and notices posted on and off the Navajo, Hopi, and Hualapai reservations to inform and solicit comments.

Early in the project, representatives of Western and DPA held several meetings with a number of agencies that could have some jurisdictional interest in the project. A total of 25 agency meetings were held. Further, Western requested that Federal agencies and American Indian tribes potentially affected by the project cooperate in preparing the EIS. These cooperating agencies include the Forest Service, BLM, BIA, NPS, Navajo Nation, Hopi Tribe, and Hualapai Tribe.

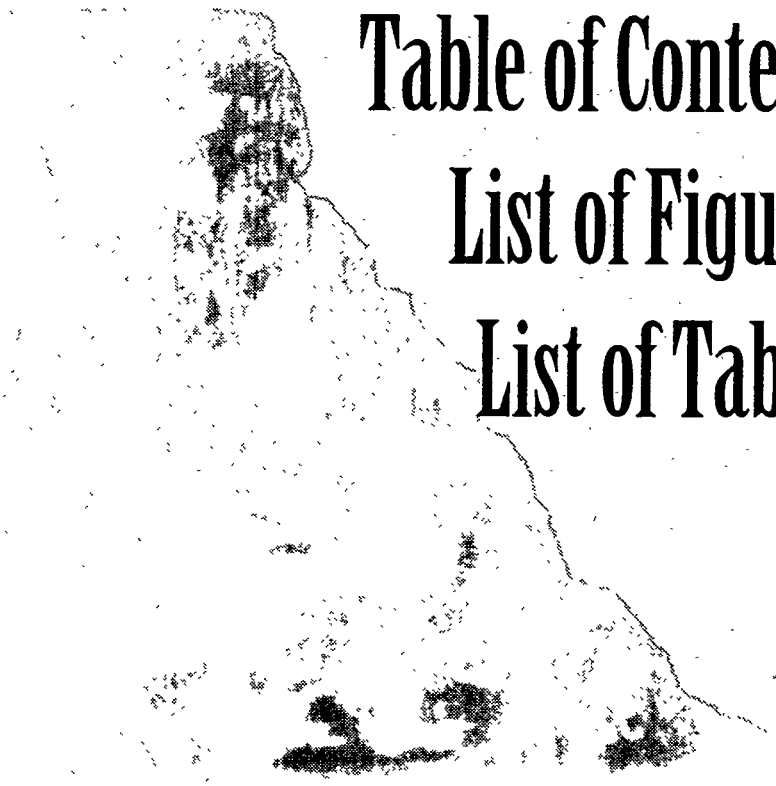
Twenty public meetings were conducted by Western at various locations within the project area from August through October in 1993. More than 325 people attended the meetings, and 131 written responses were received. In addition, newsletters were mailed, notices were posted, and print and broadcast media were notified. In general, comments from both the public and agencies related to project need, benefits, the transmission line alternative routes, right-of-way, and health and safety. These comments and the entire agency coordination and public involvement program are discussed in Chapter 5 of the DEIS.

The scoping activities described above are just part of the comprehensive program for agency coordination and public participation that was developed as an integral part of the environmental process (Chapter 5). Since scoping, additional newsletters have been distributed to provide updates on the project. Presentations were made at Hopi and Hualapai community meetings, Navajo Chapter meetings, grazing committee meetings, and various tribal government committee meetings. Displays at Navajo fairs have provided information to the public.

Public information meetings were later held in June 1995 to provide information about the preliminary results of the environmental studies and alternative route analysis. Comments similar to those received during scoping were expressed. Public review of the DEIS will be completed during a 60-day review period and through formal public hearings to be conducted by Western during the fall of 1996. There will be a public review of the FEIS as well.

Another related element of the environmental process is "environmental justice," which is mandated in the form of Executive Order 12898. The executive order requires that Federal actions avoid disproportionately high and adverse impacts on minority or low income communities. Based on the results of the NTP DEIS, no such impacts are anticipated. The project area encompasses a large geographic region within which are the reservations of three culturally different American Indian groups.

Considering the magnitude of the project and the economic importance of its outcome to the Navajo Nation, it is important that information about the project reach and be understood by people residing throughout the area for the project to be accepted. In order to encourage public partnerships and communication with low income and minority populations in the project area, the public involvement program (Chapter 5), integrated with the environmental planning process, was designed to be comprehensive and to respect and incorporate the different socio-cultural perspectives into the environmental analysis criteria. The process provided opportunities for public participation in and access to information on health and the environment as it relates to NTP. Serious attention to all public comments enhanced the outcome of the process.



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