

CHAPTER 3

EXISTING ENVIRONMENT

The following sections briefly describe the environmental resources at the WIPP site that may be affected by the proposed activities. The primary source of information on these resources is WIPP SEIS-II (DOE 1997).

3.1 LAND USE

The FEIS (DOE 1980) states that almost 7,700 hectares (19,000 acres) of land surrounding WIPP were committed to the WIPP project. It notes that the dominant use of the land within 16 kilometers (10 miles) of the site is grazing, with lesser amounts used for oil and gas extraction and potash mining. The Bureau of Land Management (BLM) administers most of this land. Two ranches are located within 16 kilometers (10 miles) of the WIPP site, while the closest town, Loving, New Mexico, is 29 kilometers (18 miles) away. The federal government or the State of New Mexico administers most of the land within 50 kilometers (30 miles) of the WIPP site. Within 80 kilometers (50 miles) of the site, land uses include dryland farming, irrigated farming along the Pecos River, forest, wetland, and urban areas.

SEIS-I (DOE 1990) notes the release of approximately 4,450 hectares (11,000 acres) of previously restricted land for unrestricted use, allowing exploration for and development of mineral resources and permanent habitation. It describes a land withdrawal boundary, which defines the WIPP site, as encompassing 16 sections (4,146 hectares [10,240 acres]) of federal land in Township 22 South, Range 31 East. This boundary was delineated so as to extend at least 1.6 kilometers (1 mile) beyond any WIPP underground development.

On October 30, 1992, the President signed into law the Land Withdrawal Act (Public Law 102-579); it was amended in 1996 (Public Law 104-201). This Act transferred responsibility for management of the WIPP withdrawal area from the Secretary of the Interior to the Secretary of Energy. The land is permanently withdrawn from all forms of entry, appropriation, and disposal under the public land laws and is reserved for uses associated with the purposes of WIPP. However, EPA has determined that the exercise of existing rights under oil and gas leases within the Land Withdrawal Area would not affect WIPP performance and that, therefore, some oil and gas exploration below 1,800 meters (6,000 feet) is allowed under the Land Withdrawal Act. The Act also establishes certain rights and responsibilities, one of which was the preparation of a Land Management Plan (DOE 1993a). The WIPP Land Management Plan establishes a goal of multiple-use management for the surface area, as well as opportunities for participation in land use planning by the public and by federal, state, and local agencies.

The site has been divided into four areas under DOE control. A chain-link fence surrounds the innermost Property Protection Area, which includes the surface facilities. Surrounding this inner area is the Exclusive Use Area, set off by a barbed-wire fence. Enclosing these areas is the Off-Limits Area, which is unfenced to allow livestock grazing but, like the other two, is patrolled and posted against trespass or other land uses. Beyond the "Off-Limits Area," but within the 16-section WIPP site, the land is managed under the public land use concept of multiple use. Mining and drilling for purposes other than support of the WIPP project, however, are restricted (DOE 1997). The type of land use surrounding WIPP has not changed substantially since the preparation of SEIS-II in 1997 (DOE 1997), although the level of development has increased.

3.2 GEOLOGY

3.2.1 Regional Setting and Surface Geology

WIPP is located in southeastern New Mexico, in the Pecos Valley Section of the Great Plains Physiographic Province. The terrain throughout the province varies from plains and lowlands to rugged canyons. In the immediate vicinity of WIPP, numerous small mounds formed by wind-blown sand characterize the land surface. A high plains desert environment characterizes the area. Due to the seasonal nature of the rainfall, most surface drainage is intermittent. The Pecos River, 20 kilometers (12 miles) southwest of the WIPP boundary, is a perennial river and the master drainage for the region. Prominent local physiographic features include Nash Draw (a shallow, 8-kilometer [5-mile] wide valley open to the southwest located west of the WIPP site) and the San Simon Swale (a broad depression about 24 kilometers [15 miles] east of the WIPP site) (Figure 3-1) (DOE 1997).

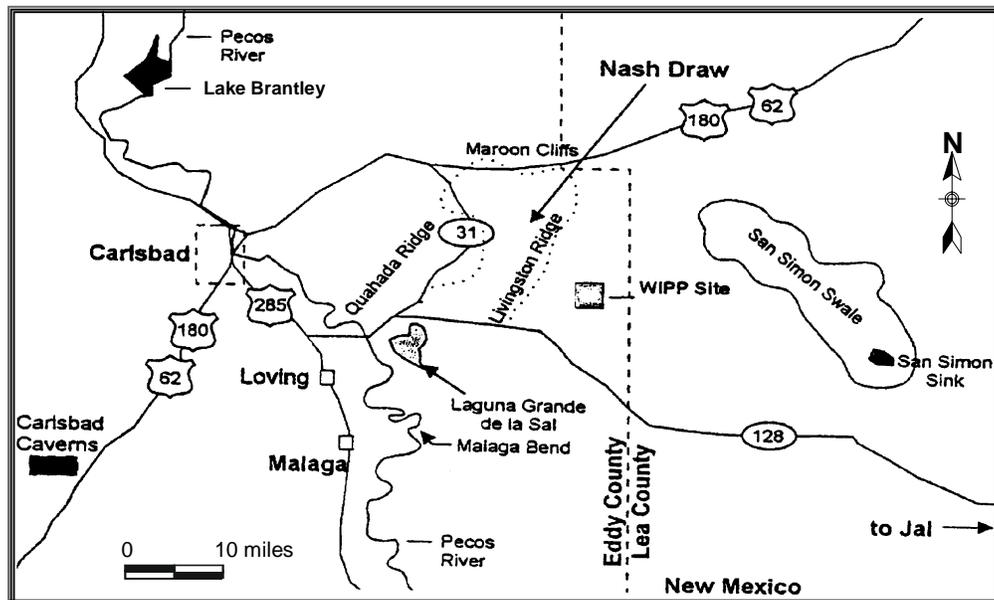


Figure 3-1. Physiographic Features Near the WIPP Site

3.2.2 Subsurface Geology

WIPP is located in the northern portion of the Delaware Basin, a structural basin underlying present-day southeastern New Mexico and western Texas and containing a thick sequence of sandstones, shales, carbonates, and evaporites. The WIPP repository is located at a depth of approximately 655 meters (2,150 feet) in rocks of Permian age.¹ These rocks represent the thickest portion of the structural basin underlying WIPP. They are composed of saltbeds and are essentially hydrologically isolated from overlying layers (DOE 1997).

¹ A geologic period of the Upper Paleozoic era, extending from the end of the Carboniferous period to the beginning of the Mesozoic era (from about 295 million to 250 million years ago).

The sediments accumulated during the Permian period represent the thickest portion of the sequence in the northern Delaware Basin and are divided into four series. From oldest to youngest, these series are the Wolfcampian, Leonardian, Guadalupian, and Ochoan. The Ochoan series is divided into four formations. From oldest to youngest, these formations are: Castile, Salado (the lower part of which contains the WIPP repository), Rustler, and Dewey Lake (see Figure 1-3).

3.2.3 Faulting and Seismicity

No surface displacement or faulting younger than early Permian have been reported, indicating that tectonic movement since then, if any, has not been noteworthy. The most recent earthquake recorded at the WIPP site occurred on April 14, 1995; its epicenter was located approximately 240 kilometers (150 miles) south of the site. It was assigned a magnitude of 5.3 and had no effect on any structures at WIPP (DOE 1997).

3.3 HYDROLOGY

3.3.1 Surface Water

WIPP is located east of the Pecos River and within the Pecos River basin (which represents about one-half of the drainage area of the Rio Grande Water Resources Region). The drainage area of the Pecos River at this location is 49,200 square kilometers (19,000 square miles). The WIPP site has a few small intermittent creeks, the only westward-flowing tributaries of the Pecos River within 32 kilometers (20 miles) north or south of the site.

The Pecos River is the main surface water resource in the WIPP vicinity. Due to inflow from brine springs (from the Rustler Formation) and slight exceedance of water quality levels of certain heavy metals over water quality standards (DOE 1996a), river water is not used for human consumption. Irrigation and livestock watering are the primary uses of the water from the Pecos.

More than 90 percent of the mean annual precipitation at the site is lost by evapotranspiration. On a mean monthly basis, evapotranspiration at the site greatly exceeds the available rainfall; however, intense local thunderstorms produce runoff and percolation. The maximum recorded flood on the Pecos River occurred on August 23, 1966, near Malaga, about 25 kilometers (15 miles) from WIPP. The maximum elevation of the flood was 90 meters (300 feet) below the elevation of the WIPP surface facility.

3.3.2 Groundwater

The WIPP repository is situated in the thick, relatively impermeable Salado Formation salt beds 655 meters (2,150 feet) below the ground surface (see Figure 1-3). Generally, groundwater in the Rustler and Dewey Lake Formations and the units overlying them is essentially isolated from the hydrology of the Salado Formation.

The Rustler Formation includes the Culebra and Magenta Dolomites, two units containing water of low quality (brine to brackish) (DOE 1996b). The Culebra Dolomite, which is the first notable water-bearing unit above the Salado Formation, has been investigated for its potential to transport radionuclides released from the repository. Groundwater flow in the units overlying the Salado Formation has been assumed to occur primarily in the Culebra Dolomite, although it is recognized that regional flow in the Rustler Formation is three-dimensional and occurs to some degree in all Rustler units (DOE 1996b). Flow in the Culebra is generally from north to south. The Dewey Lake Formation overlies the Rustler Formation and in some areas is relatively transmissive, particularly in the south central and southwestern part of the

WIPP site (DOE 1996b). The location of the water table is generally considered to be the Dewey Lake Formation.

Only a few locations of groundwater recharge and discharge to and from the Rustler Formation are known. The only documented areas of naturally occurring groundwater discharge in the vicinity of WIPP are the Pecos River near Malaga Bend (Hunter 1985) and, to a lesser extent, the saline lakes in Nash Draw. This local flow associated with Nash Draw is unrelated to groundwater flow at WIPP. The only documented area of groundwater recharge is also near Malaga Bend (Hunter 1985). This location is hydraulically downgradient from the repository, and recharge here has little relevance to flow near WIPP. Recent regional groundwater modeling by Corbet and Knupp (1996) has suggested that groundwater in the Culebra, Magenta, and Dewey Lake and Triassic units originates in areas that are north and northeast of the WIPP site (DOE 1996b).

3.4 BIOLOGICAL RESOURCES

The vegetation at the WIPP site area is dominated by shinnery oak (*Quercus havardii*), mesquite (*Prosopis grandulosa*), sand sage (*Artemisia filifolia*), and smallhead snakeweed (*Gutierrezia microcephala*) (DOE 1990).

Ninety-eight species of birds are known to inhabit or migrate through the area (DOE 1993b, 1994, and 1995a). The Harris hawk (*Parabuteo unicinctus*), loggerhead shrike (*Lanius ludovicianus*), and black-throated sparrow (*Anthispiza bilineata*) are resident birds.

Small mammals that are common at the WIPP site area include the black-tailed jackrabbit (*Lepus californicus*), the desert cottontail (*Sylvilagus auduboni*), and Ord's kangaroo rat (*Dipodomys ordii*). Mule deer (*Odocoileus hemionus*) and pronghorn (*Antilocapra americana*) are among the larger mammals that occur at the site. Stock watering ponds and tanks provide aquatic habitat for yellow mud turtles (*Kinosteron flarescens*) and tiger salamanders (*Ambystoma tigrinum*) (DOE 1993b, 1994, 1995a).

The Department concluded in SEIS-I that there is no critical habitat for terrestrial species identified as endangered, threatened, or candidate species by either the U.S. Fish and Wildlife Service or the New Mexico Department of Game and Fish at the site (DOE 1990).

In 1996, DOE conducted a survey on the WIPP Land Withdrawal Area and associated lands to investigate the potential for impacts to rare, threatened, endangered, or sensitive plant or animal species as a result of the potential actions presented in SEIS-II (DOE 1997). The 1996 survey included an assessment of suitable habitats for these species. No federal- or state-listed species were found on the WIPP Land Withdrawal Area during the survey. The data reported in the survey, which support the conclusions of other studies, remain valid in 2000 and indicate that permanent populations of these species are not currently established on WIPP lands (Lynn 2000).

Currently, the U.S. Fish and Wildlife Service lists 5 federally endangered, 5 federally threatened species, and 3 candidate species for Eddy County (FWS 2000). The New Mexico Department of Game and Fish currently lists 11 endangered and 21 threatened animal species (NMDG&F 2000), while the New Mexico Energy, Minerals, and Natural Resources Department lists 8 endangered and 18 state-sensitive plant species for Eddy County (NMEMNR 2000) (Table 3-1).

Table 3-1. State of New Mexico Threatened and Endangered Species (Eddy County)

| Scientific Name | Common Name | Status |
|--|-----------------------------|--------------------------------------|
| Birds | | |
| <i>Haliaeetus leucocephalus</i> | Bald eagle | Federal and State Threatened |
| <i>Sterna antillarum</i> | Interior least tern | Federal and State Endangered |
| <i>Strix occidentalis lucida</i> | Mexican spotted owl | Federal Threatened |
| <i>Falco femoralis septentrionalis</i> | Northern aplomado falcon | Federal and State Endangered |
| <i>Empidonax traillii extimus</i> | Southwest willow flycatcher | Federal and State Endangered |
| <i>Pelecanus occidentalis carolinensis</i> | Brown pelican | State Endangered |
| <i>Phalacrocorax brasilianus</i> | Neotropic cormorant | State Threatened |
| <i>Falco peregrinus anatum</i> | American peregrine falcon | State Threatened |
| <i>Charadrius melodus circumcinctus</i> | Piping plover | State Endangered |
| <i>Columbina passerina pallescens</i> | Common ground dove | State Endangered |
| <i>Cyananthus latirostris magicus</i> | Broad-billed hummingbird | State Threatened |
| <i>Vireo bellii</i> | Bell's vireo | State Threatened |
| <i>Vireo vicinior</i> | Gray vireo | State Threatened |
| <i>Ammodramus bairdii</i> | Baird's sparrow | State Threatened |
| <i>Passerina versicolor</i> | Varied bunting | State Threatened |
| Mammals | | |
| <i>Mustela nigripes</i> | Black-footed ferret | Federal Endangered |
| <i>Cynomys ludovicianus</i> | Black-tailed prairie dog | Federal Candidate |
| <i>Vulpes velox</i> | Swift fox | Federal Candidate |
| <i>Tympanuchus pallidicinctus</i> | Lesser prairie chicken | Federal Candidate |
| <i>Cryptotis parva</i> | Least shrew | State Threatened |
| <i>Pseudemys gorzugi</i> | Western river cooter | State Threatened |
| Reptiles | | |
| <i>Sceloporus arenicolus</i> | Sand dune lizard | State Threatened |
| <i>Lampropeltis alterna</i> | Gray-banded kingsnake | State Endangered |
| <i>Nerodia erythrogaster transversa</i> | Blotched water snake | State Endangered |
| <i>Thamnophis proximus diabolicus</i> | Arid land ribbon snake | State Threatened |
| <i>Crotalus lepidus lepidus</i> | Mottled rock rattlesnake | State Threatened |
| Fish | | |
| <i>Notropis simus pecosensis</i> | Pecos bluntnose shiner | Federal and State Threatened |
| <i>Gambusia nobilis</i> | Pecos gambusia | Federal and State Endangered |
| <i>Astyanax mexicanus</i> | Mexican tetra | State Threatened |
| <i>Cycleptus elongatus</i> | Blue sucker | State Endangered |
| <i>Moxostoma congestum</i> | Gray redhorse | State Threatened |
| <i>Cyprinodon pecosensis</i> | Pecos pupfish | State Threatened |
| <i>Etheostoma lepidum</i> | Greenthroat darter | State Threatened |
| <i>Percina macrolepida</i> | Bigscale logperch | State Threatened |
| Invertebrates | | |
| <i>Popenaias popeii</i> | Texas hornshell | State Endangered |
| <i>Pyrgulopsis pecosensis</i> | Pecos pyrg snail | State Threatened |
| <i>Vertigo ovata</i> | Ovate vertigo snail | State Threatened |
| Plants | | |
| <i>Echinocereus fendleri kuenzleri</i> | Kuenzler hedgehog cactus | Federal and State Endangered |
| <i>Coryphantha (Escobaria) sneedii</i> var. <i>lei</i> | Lee pincushion cactus | Federal Threatened, State Endangered |
| <i>Amsonia tharpii</i> | Tharp's bluestar | State Endangered |
| <i>Coryphantha scheeri</i> | Scheer's pincushion cactus | State Endangered |

Table 3-1. State of New Mexico Threatened and Endangered Species (Eddy County) (continued)

| Scientific Name | Common Name | Status |
|---|--------------------------|--------------------------------------|
| <i>Echinocereus lloydii</i> | Lloyd's hedgehog cactus | State Endangered |
| <i>Eriogonum gypsophilum</i> | Gypsum wild buckwheat | Federal Threatened, State Endangered |
| <i>Hexalectris nitida</i> | Shining coral-root | State Endangered |
| <i>Hexalectris spicata</i> | Crested coral-root | State Endangered |
| <i>Aquilegia chrysantha</i> var. <i>chaplinei</i> | Chapline's columbine | State Sensitive |
| <i>Astragalus gypsodes</i> | Gypsum milkvetch | State Sensitive |
| <i>Astragalus waterfallii</i> | Waterfall milkvetch | State Sensitive |
| <i>Chaetopappa hersheyi</i> | Hershey's cliff daisy | State Sensitive |
| <i>Chrysothamnus nauseosus</i> ssp. <i>texensis</i> | Guadalupe rabbitbrush | State Sensitive |
| <i>Epipactis gigantea</i> | Giant helleborine orchid | State Sensitive |
| <i>Eustoma exaltatum</i> | Catchfly gentian | State Sensitive |
| <i>Hedeoma apiculata</i> | McKittrick pennyroyal | State Sensitive |
| <i>Justicia wrightii</i> | Wright's justicia | State Sensitive |
| <i>Penstemon cardinalis</i> spp. <i>regalis</i> | Guadalupe penstemon | State Sensitive |
| <i>Philadelphus hitchcockianus</i> | Hitchcock's mockorange | State Sensitive |
| <i>Polygala rimulicola</i> | Guadalupe milkwort | State Sensitive |
| <i>Proboscidea sabulosa</i> | Dune unicorn plant | State Sensitive |
| <i>Pseudocymopterus longiradiatus</i> | Desert parsley | State Sensitive |
| <i>Sibara grisea</i> | Gray sibara | State Sensitive |
| <i>Sophora gypsophila</i> var. <i>guadalupensis</i> | Guadalupe mescal bean | State Sensitive |
| <i>Streptanthus sparsiflorus</i> | Guadalupe jewelflower | State Sensitive |
| <i>Valeriana texana</i> | Texas tobacco root | State Sensitive |

Sources: FWS 2000, NMDG&F 2000, NMEMNR 2000

3.5 CULTURAL RESOURCES

Sixty archaeological sites and 91 isolated occurrences (single or few artifacts, or isolated features) have been recorded in the Land Withdrawal Area. The sites and isolates are almost exclusively prehistoric in origin, with only one of the 60 sites having both prehistoric and historic components. The 91 isolated occurrences have been recorded and are not likely to yield information beyond what has already been documented. Isolated occurrences are generally not eligible for inclusion in the National Register of Historic Places (NRHP). Additional investigations, therefore, are generally not required for isolates.

Many of these cultural resources are likely to yield important information about the prehistoric and early history of southeastern New Mexico. Based on the site inventory data, and assuming environmental homogeneity and a fairly even distribution of archaeological sites across the landscape, DOE estimates that the WIPP project area may contain a total of about 99 archaeological sites and 153 isolates (DOE 1993a). Historic landmarks in Eddy County include historic settlements and remains of historic trails (NMSHTD 1984). There are no known Native American sacred sites or burials in the Land Withdrawal Area. Prior to the passage of the Land Withdrawal Act in 1992, BLM managed the cultural resources at WIPP. A memorandum of understanding between DOE and the Department of the Interior in 1994 transferred management responsibility for the cultural resources to DOE. Cultural resources are currently managed according to guidelines set forth in the WIPP Land Management Plan (DOE 1993a). DOE and the State of New Mexico have signed a Joint Powers Agreement that includes provisions specifying how DOE will satisfy its obligations regarding cultural resources under Sections 106 and 110 of the National Historic Preservation Act. Any cultural resources encountered during the Proposed Action would be addressed according to the conditions set forth in the Joint Powers Agreement.

3.6 SOCIOECONOMICS

The 1997 population estimate for Eddy County was 53,256, of which approximately 40 percent were minorities. The 1997 population estimate for Lea County was 56,387, of which approximately 37 percent were minorities (U.S. Bureau of the Census 2000b).

Per capita income for Eddy County in 1994 was approximately \$16,100, while the 1993 median family income was approximately \$27,100. In 1993, about 20 percent of the population of Eddy County lived below the poverty level (U.S. Bureau of the Census 2000b). For Lea County, per capita income in 1994 was approximately \$15,250, while the median family income in 1993 was almost \$27,400. In 1993, about 23 percent of the population of Lea County lived below the poverty level (U.S. Bureau of the Census 2000b).

Economic figures for Eddy County in 1997 indicate a county-wide workforce of 16,368 employees, the majority of which were employed in the mining (17 percent), manufacturing (10 percent), retail trade (22 percent), or services (28 percent), especially health services (12.5 percent) industries. Payroll income for the county was approximately \$416 million, the majority of which was earned in the mining (27 percent), manufacturing (16 percent), retail trade (11 percent), transportation and public utilities (13 percent), and service (19.5 percent) industries. Over half of the income in service industries came from the health services sector and two-thirds of the income in transportation came from the trucking sector (U.S. Bureau of the Census 2000a).

Economic figures for Lea County in 1997 indicate a county-wide workforce of 15,759 employees, the majority of which were employed in the oil and gas (13 percent), retail trade (23 percent), or services (28 percent) industries. Payroll income for the county was approximately \$358 million, the majority of which was earned in the oil and gas (19 percent), transportation and public utilities (13 percent), retail trade (13 percent), and service (23 percent) industries. About 40 percent of the income in service industries came from the health services sector (U.S. Bureau of the Census 2000a).

3.7 NOISE

The ambient noise level around WIPP has been estimated to be about 50 decibels at a distance of 120 meters (400 feet) from the Waste Handling Building due to normal operations (DOE 1980). This qualitative estimate was determined to be accurate for WIPP SEIS-II (DOE 1997) and remains accurate for the current WIPP operations. DOE requires its facilities to comply with Occupational Safety and Health Administration (OSHA) standards as promulgated in 29 CFR Part 1910.95 for protection of workers.

3.8 AIR QUALITY

The EPA has classified Eddy County, New Mexico, where WIPP is located, as an attainment area for all six criteria pollutants under the National Ambient Air Quality Standards: nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter less than 10 microns (PM₁₀), lead, and ozone. WIPP is also in a Class II Prevention of Significant Deterioration area, and any new sources of emissions would have to adhere to the standards for such an area.

Air quality monitoring data collected since 1990 are summarized in annual WIPP site environmental reports. On October 30, 1994, DOE, after notifying EPA, ceased to monitor criteria air pollutants at WIPP because there was no longer a regulatory requirement to do so. WIPP has completed inventories of potential pollutants and emissions in accordance with EPA and New Mexico Air Quality Control Regulations (AQCR). Based on these inventories, WIPP has no permitting or reporting requirements at

this time except for those applying to two primary backup diesel generators. An AQCR operating permit was issued for the two diesel generators in 1993 (DOE 1995a). These diesel generators are assumed to emit four pollutants (nitrogen dioxide, sulfur dioxide, carbon monoxide, and PM₁₀) and have strict limits on emissions for these pollutants.

3.9 ENVIRONMENTAL JUSTICE

Environmental justice in the context of this document refers specifically to the potential for minority and low-income populations to bear a disproportionate share of high and adverse environmental impacts from activities at WIPP. The environmental justice region of influence (ROI) covers all populations within an 80-kilometer (50-mile) radius of the reservation boundary of WIPP.² This region includes parts of three counties in New Mexico (Chaves, Eddy, and Lea) and parts of seven counties in Texas (Andrews, Culberson, Gaines, Loving, Reeves, Ward, and Winkler). Seventy-five percent of the ROI lies within New Mexico, and the remaining 25 percent lies within Texas.

The following population data are derived from the 1990 Census of Population and Housing (U.S. Bureau of the Census 1994); these data are the best available environmental justice data at the block group level. (Block grouping is a division of territory, the size of which varies according to population density, that has approximately 400 households.) Race/ethnic data from the 2000 census for all geographic levels (including block groups) will be released in April 2001; poverty data will be available in 2002 (UNM 2000).

Within the environmental justice ROI, the total population of 101,129 persons includes 4.1 percent non-White, 32.6 percent Hispanic, and 36.8 percent minority (all except White non-Hispanic persons). In addition, 21.5 percent of the total population had 1989 incomes below the poverty level, as defined by the U.S. Bureau of the Census. There are no Native American reservations in the ROI (U.S. Bureau of Census 1994). Figures 3-2 and 3-3 display maps of the distribution of minority and low-income populations according to the percentage of the block group population in the environmental justice ROI.

More recent data estimates on low-income and minority populations are available at the county level. Tables 3-2 and 3-3 show estimated county-level low-income and minority data, respectively, for the affected counties in the ROI.

The proportion of Hispanic, minority, and low-income persons in the ROI are all greater than in the United States as a whole. Also, the proportion of low-income persons in the ROI is greater than in both New Mexico and Texas. Finally, the proportion of Hispanic persons in the ROI is smaller than in New Mexico but greater than in Texas.

² Towns in this ROI include Artesia, Atoka, Black River village, Carlsbad, El Paso Gap, Hope, Lakewood, Loco Hills, Loving, Malaga, Riverside, Seven Rivers, and Whites City in Eddy County, New Mexico and Eunice, Hobbs, Humble City, Jal, Lovington, Maljamar, Monument, Nadine, and Oil Center in Lea County, New Mexico. This ROI also includes Mentone in Loving County, Texas, and both Arno and Orla in Reeves County, Texas. The other counties in New Mexico and Texas that are part of this ROI have no communities within the 80-kilometer radius.

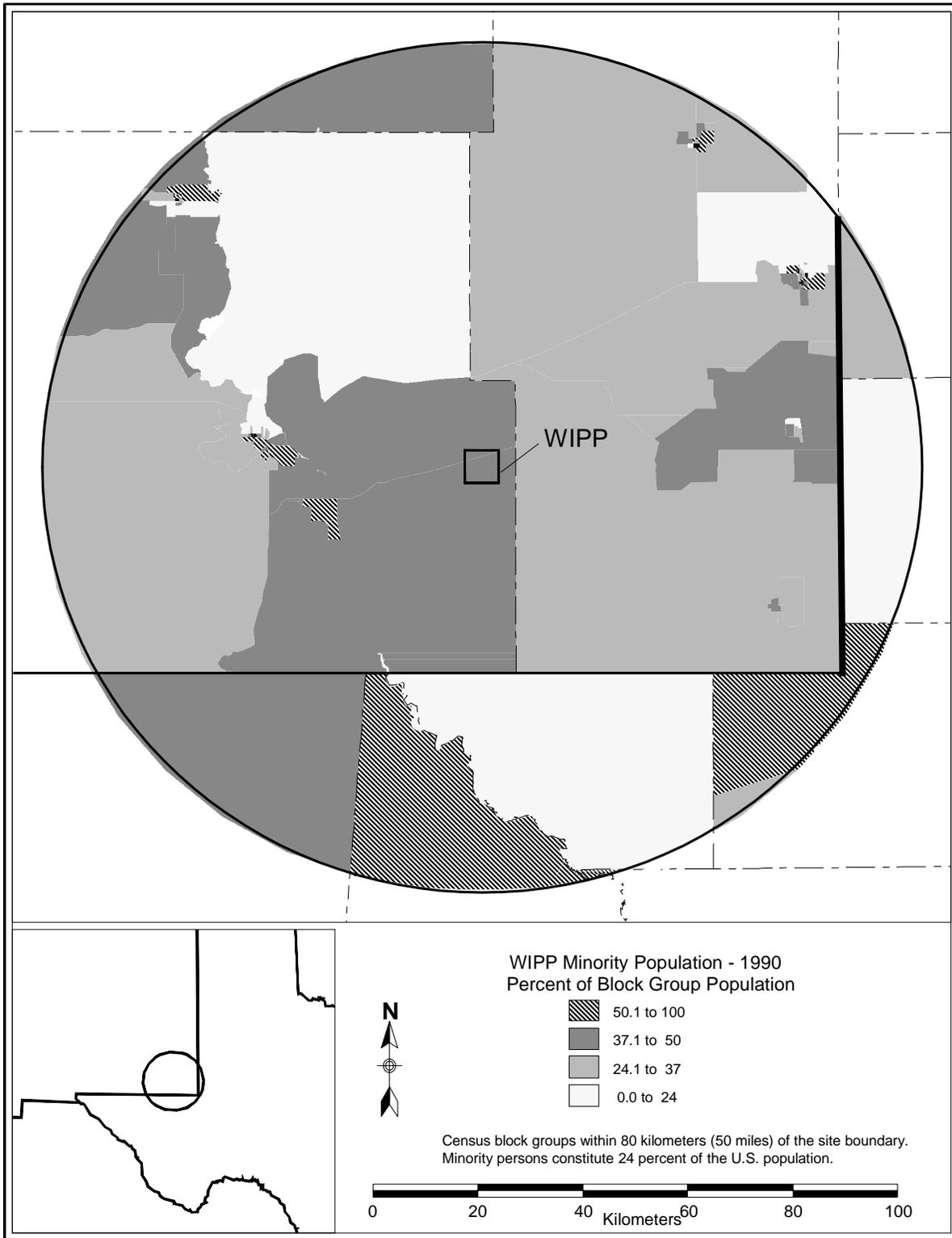


Figure 3-2. Minority Population, WIPP ROI

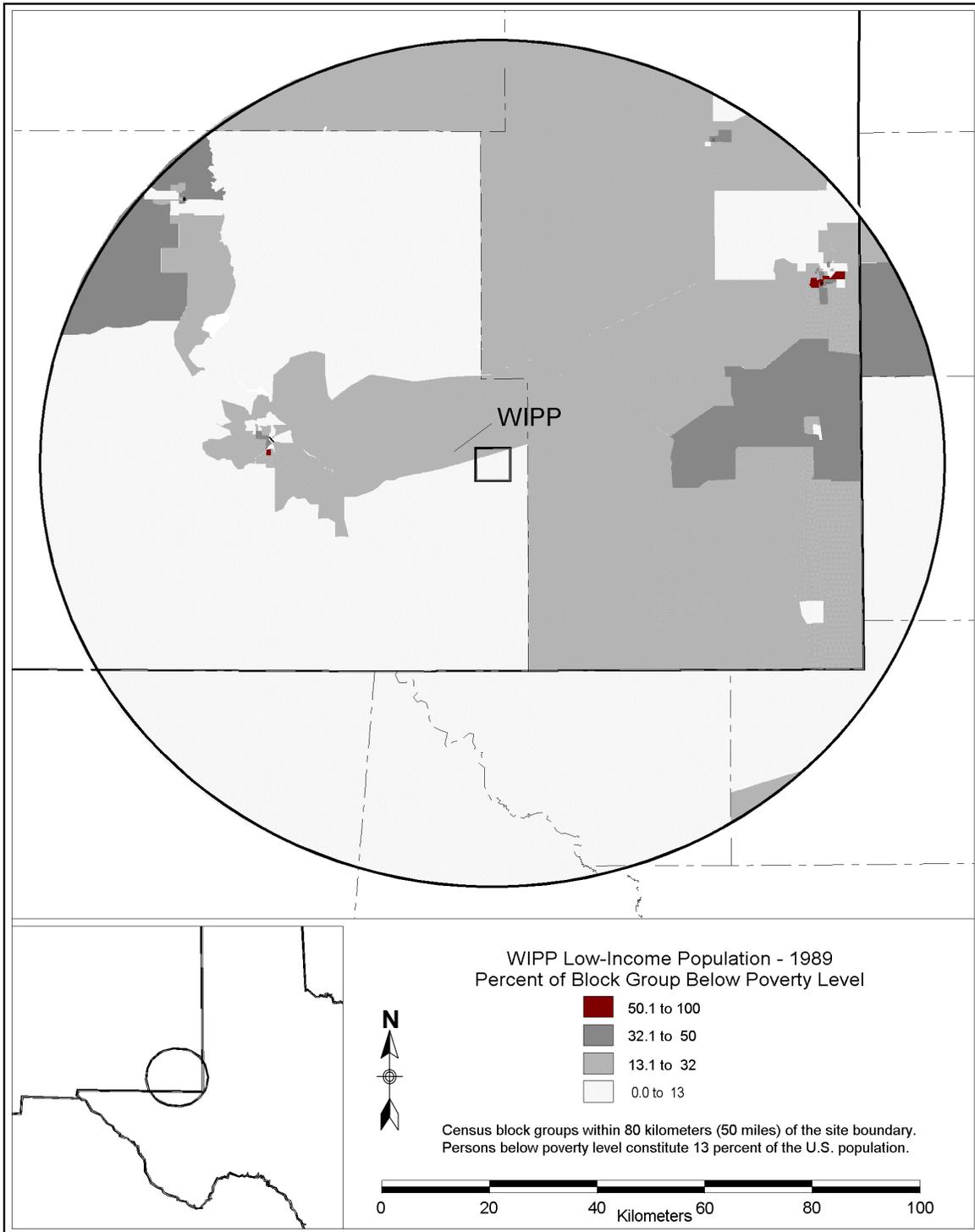


Figure 3-3. Low-Income Population, WIPP ROI

Table 3-2. ROI County Estimates for Low-Income Populations

| County | Percent Estimate^a |
|-------------------|-------------------------------------|
| New Mexico | |
| Eddy | 18.6 |
| Lea | 20.7 |
| Chaves | 23.1 |
| Texas | |
| Andrews | 15.8 |
| Culberson | 32.6 |
| Gaines | 20.6 |
| Loving | 22.9 |
| Reeves | 27.5 |
| Ward | 19.4 |
| Winkler | 16.8 |

a. Estimates model 1997 income reported in the March 1998 Current Population Survey (U.S. Bureau of the Census 1998).

Table 3-3. ROI County Estimates for Minority Populations

| County | Percent Estimate |
|-------------------|-------------------------|
| New Mexico | |
| Eddy | 40.6 |
| Lea | 37.6 |
| Chaves | 42.5 |
| Texas | |
| Andrews | 41.4 |
| Culberson | 77.0 |
| Gaines | 42.3 |
| Loving | 16.8 |
| Reeves | 79.5 |
| Ward | 47.8 |
| Winkler | 46.2 |

Source: U.S. Bureau of the Census 2000c.

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