U.S. Environmental Protection Agency
Region 9
Clean Air Act Permit

Environmental Justice Analysis

Four Corners Power Plant
Proposed PSD Permit NN 14-01 and Tribal Minor NSR T-002-NN
July 2014

Introduction

Executive Order 12898, entitled "Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations," states in relevant part that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Section 1-101 of Exec. Order 12898, 59 Fed. Reg. 7629, (Feb. 16, 1994). "Federal agencies are required to implement this order consistent with, and to the extent permitted by, existing law." *Id.* at 7632. Based on this Executive Order, the EPA's Environmental Appeals Board (EAB) has held that environmental justice issues must be considered in connection with the issuance of federal Clean Air Act (CAA) Prevention of Significant Deterioration (PSD) permits issued by EPA Regional Offices and states acting under delegations of Federal authority. *See, e.g., In re Prairie State Generating Company*, 13 E.A.D. 1, 123 (EAB 2006); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 174-75 (EAB 1999) ("Knauf I"). EPA Regional Offices or their delegates in the states have for several years incorporated environmental justice considerations into their review of applications for PSD permits. The EAB reinforced the importance of completing an environmental justice analysis in a recent opinion discussed further below. *See In re: Shell Gulf of Mexico, Inc. and Shell Offshore, Inc.*, OCS Appeal Nos. 10-1 to 10-4, Slip Op. at 63-4 (EAB December 30, 2010) ("*Shell II*").

EPA determined that there may be minority or low-income populations potentially affected by its proposed action on the Four Corners Power Plant (FCPP) Prevention of Significant Deterioration (PSD) permit application, and determined that it would be appropriate to prepare an Environmental Justice Analysis for this action, which is provided below.

For purposes of the Executive Order on environmental justice, EPA has recognized that compliance with the applicable National Ambient Air Quality Standards (NAAQS) is emblematic of achieving a level of public health protection that demonstrates that EPA's issuance of a permit for a proposed facility will not have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations. *See, e.g., Shell II.*, slip op. at 74; *In re Shell Offshore Inc.*, 13 E.A.D. 357, 404-5 (EAB 2007) ("*Shell I*"); *In re Knauf Fiber Glass, GmbH*, 9 E.A.D 1, 15-17 (EAB 2000) ("*Knauf II*"); *In re AES Puerto Rico*, L.P., 8 E.A.D. 324, 351 (EAB 1999). This is because the NAAQS are health-based standards, designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. As the EAB observed, "[i]n the context of an environmental justice analysis, compliance with the NAAQS is emblematic of achieving a level of public health protection that, based on the level of protection afforded by the NAAQS, demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants." *Shell II*, Slip Op. at 73.

The studies assessed by EPA in setting NAAQS and the integration of the scientific evidence presented therein have undergone extensive critical review by EPA, the Clean Air Scientific Advisory Committee (CASAC), and the public. See e.g., Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Final Rule, 75 Fed. Reg. 6474, 6478 Feb. 9, 2010. "The rigor of the review makes these studies, and their integrative assessment, the most reliable source of scientific information on which to base decisions on the NAAQS." *Id.* When setting the NAAQS, "[t]he Administrator's final decisions draw upon scientific information and analysis related to health effects, population

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exposures, and risks; judgments about the appropriate response to the range of uncertainties that are inherent in scientific evidence and analyses; and comment received from CASAC and the public." *Id.* at 6483. In light of these characteristics of the process for setting the standards, the EAB generally "relies on and defers to the Agency's cumulative expertise when upholding a permit issuer's environmental justice analysis based on a proposed facility's compliance with the relevant NAAQS in a PSD appeal." *Shell II*, Slip Op. at 74.

Pursuant to Clean Air Act section 165(a)(3), construction of a major emitting facility may not commence until the owner or operator of such facility demonstrates, among other things, that the facility will not cause or contribute to air pollution in excess of any NAAQS applicable to the PSD permit decision. 42 U.S.C. § 7475(a)(3); see also 40 CFR. 22.21(k) and 52.21(i)(2). With respect to the proposed permit for the FCPP, the Project does not trigger PSD review for any pollutant with a NAAQS, as the Project's net emissions increases fall below the significant emissions rate for those pollutants, including nitrogen dioxide (NO_2), volatile organic compounds (VOC), particular matter 10 um in diameter and smaller (PM_{10}), particulate matter 2.5 micrometer and smaller ($PM_{2.5}$), lead (Pb), sulfur dioxide (SO_2), and carbon monoxide (CO). Generally, EPA Region 9 has looked to compliance with the NAAQS to satisfy the Executive Order as to the pollutants regulated under the PSD program. However, for this Project, the only PSD pollutant with a significant net emissions increase is sulfuric acid mist (SAM), and EPA has not promulgated a NAAQS for SAM. As described in more detail below, EPA has determined that, in this case, it is appropriate to review potential impacts associated with the increases in SAM emissions from the FCPP, in order to fully consider environmental justice considerations concerning the pollutant regulated under the PSD program that is at issue in the present PSD permitting action.

Project Description

APS co-owns and operates the FCPP. The FCPP is a coal-fired power plant, utilizing pulverized coal-boilers, located on the Navajo Nation about 25 miles west of Farmington, New Mexico. The FCPP currently consists of two 750 megawatt (MW) coal-fired electric steam-generating units (EGUs), with a total capacity of approximately 1,500 MW, and other ancillary equipment such as coal storage, lime handling operations and dry ash handling operations. Previously, the FCPP consisted of five coal-fired EGUs. On August 24, 2012, EPA promulgated a source-specific Federal Implementation Plan (FIP) requiring the FCPP to achieve emission reductions required by the CAA's best available retrofit technology (BART) requirements.[1] In a letter dated December 30, 2013, APS notified EPA that as part of the compliance strategy for the BART FIP it would permanently shut down three existing EGUs – Units 1, 2, and 3 by January 1, 2014. As of January 2014, the FCPP now consists of the two remaining 750 MW EGUs – Units 4 and 5 – and the existing ancillary equipment. APS will further comply with the requirements of EPA's BART FIP by installing SCR on Units 4 and 5 to reduce emissions of nitrogen oxides (NO_X) by approximately 80% from current levels. The installation of SCR to comply with EPA's BART FIP is causing a significant net emission increase of sulfuric acid mist (SAM or H_2SO_4), which is the reason EPA must obtain a PSD permit from EPA Region 9 for this Project. Because the Project causes a significance net emissions increase only for SAM emissions, SAM is the only pollutant subject to PSD review for the SCR Project.

Currently, Units 4 and 5 are each controlled by a wet flue gas desulfurization (FGD) system and a baghouse. The wet FGD system is operated primarily to reduce sulfur dioxide (SO_2) emissions and is located at the end of the control train just prior to the flue gas exiting the stack. Each unit's baghouse is located prior to the wet FGD and used primarily for reducing PM, PM_{10}, and $PM_{2.5}$ emissions.

The FCPP SCR Project involves the installation of SCR to reduce approximately 80% of the NO_X emissions from Units 4 and 5 to comply with EPA's BART FIP. EPA's BART FIP requires installation of the SCR systems on Units 4 and 5 to improve visibility at 16 nearby Class I areas, such as Mesa Verde National Park. The new and affected emission units associated with the FCPP SCR Project are:

- Units 4 and 5 will be modified by adding new SCR emissions controls. SCR will be added to substantially reduce NO_X emissions. The SCR systems will be located after each EGU's economizer and before the air preheater.

[1] For more information on EPA's BART FIP, please see 77 Fed. Reg. 51620 (Aug. 12, 2012)

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- Because the SCR emissions controls will cause a significant net emissions increase in SAM emissions, EPA is requiring FCPP to install and operate dry sorbent injection (DSI) system as BACT to minimize SAM emissions. The DSI system will be located after the air preheater and just before the baghouse and wet FGD.
- Truck traffic will increase due to the delivery of reagent for the DSI system resulting in increased fugitive emissions from paved plant roads.
- Truck traffic will also increase due to the delivery of urea pellets, 29% aqueous ammonia, or anhydrous ammonia for the SCR system resulting in increased fugitive emissions from paved plant roads.
- A new pneumatic dry sorbent truck unloading system and silo will be installed.
- A new pneumatic urea pellet truck unloading system and silo may be installed if this reagent option is selected for the SCR system or a new ammonia truck unloading station and storage tank will be installed if either the aqueous or anhydrous ammonia option is selected for the SCR system.

Regulatory Framework

The PSD program is a preconstruction review and permitting program applicable to certain new major stationary sources and major modifications at existing major stationary sources. The specific requirements under the PSD program applicable to stationary sources located in Indian country are in EPA's Federal Implementation Plan for the PSD program at 40 CFR 52.21. The PSD program applies to any regulated NSR pollutant (as defined in 40 CFR 52.21), except for pollutants designated nonattainment for a NAAQS. The FCPP is an existing major source that is located in an area designated as attainment for all NAAQS. Therefore, the PSD program applies if the FCPP SCR Project is a major modification for any regulated NSR pollutant.

The applicability of PSD to a particular source must be determined in advance of construction or modification and is pollutant-specific. The primary criterion is whether the proposed project is sufficiently large (in terms of its emissions) to be a major stationary source or major modification. If the emissions from a project are greater than the levels that are considered a major stationary source or major modification, a PSD permit must be issued before construction of the project.

EPA has determined that a PSD permit is required because the net emissions increase of SAM is above the significance threshold of 7 tons per year. In making our applicability determination EPA also considered the contemporaneous emission decreases from the shutdown of existing Units 1, 2, and 3.

In addition to the PSD program, EPA must also consider whether this project is subject to the Minor New Source Review Program (NSR) in Indian Country found in 40 CFR 49.151-161. This program includes preconstruction permitting requirements for minor modifications at major sources located in Indian country. The requirements of this permitting program are triggered based on the applicability criteria contained in 40 CFR 49.153. Based on the net emissions increases from the FCPP SCR Project (and consideration of the contemporaneous shutdown of Units 1, 2, and 3) EPA determined that the project is not subject to the Minor NSR Program in Indian Country, except for the requirement to include increases in allowable emissions in the permit for certain auxiliary equipment associated with the Project.

Overall, the FCPP SCR Project is expected to result in a decrease of approximately 19,000 tons per year (tpy) of nitrogen oxides (NO_X) and up to a 237 tpy increase in SAM emissions.

In addition, the PSD permitting program requires that the best available control technology (BACT) be required for each emissions unit subject to PSD review. EPA's proposed permit for the Project includes, among other requirements, the use of BACT to limit emissions of sulfuric acid mist (SAM) to the greatest extent feasible.

Demographics, Public Participation/Outreach Activities, and Air Quality in the San Juan County

Description of Local Area

Four Corners Power Plant is an existing facility which is located on Navajo Indian Reservation land, half way between the towns of Shiprock and Farmington, New Mexico, in San Juan County. The power plant is surrounded by mostly

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desert land, except for Morgan Lake, which is next to and north of the power plant. Morgan Lake is a man-made reservoir, spanning approximately 1,200 acres, and is supplied with water by the San Juan River through an existing 2.5 mile-long pipeline. The plant site is already served by paved roads, existing transmission lines, pumping station pipelines for water and other surrounding, ancillary facilities. The existing ancillary facilities that support the power plant include transmission lines, fly ash storage silos, three switchyards, and condenser cooling water intake canals. The power plant also has an existing, electric rail line that transports coal from the Navajo mine to the facility.

The population centers located within San Juan County in the vicinity of the Project site include the unincorporated communities of Waterflow, NM (3.79 miles/ 6.1 km north), Fruitland, NM (5.1 miles/ 8.2 km northeast), and Kirtland, NM (5.4 miles/8.7 km northeast). Farther out are the town of Shiprock (11.6 miles/18.6 km northwest) with a population of 6,380 and the City of Farmington (18 miles/28.9 km east) with a population of 37,117 as of the 2010 census.

The facility is located on the Navajo Nation Indian Reservation and there are no other tribes within a 50 km radius. Other neighboring tribes within a 100 km radius include the Ute Mountain Indian Reservation to the northwest, the Southern Ute Indian Reservation to the northeast, and the Jicarilla Apache to the west of Fruitland.

Demographic Information

EPA's screening for potential environmental justice concerns focused on an area encompassed by a 25 km radius from the proposed facility. This radius includes the primary populations that are expected be impacted by the emissions from the Project. However, this size of an area is generally much greater than typically considered for community level impacts, so EPA also includes demographic information for areas closer to the proposed facility. We included demographic information for areas of 5 and 15 km radii for comparison. These areas are all encompassed within the County of San Juan. Thus, to compare information, EPA will present metrics for both San Juan County and the State of New Mexico as a whole.

Demographic information is captured within three radii surrounding the Four Corners Power Plant at 25, 15, and 5 km[2].

Table 2: Average Demographic Information* for Proposed Project Location and Surrounding Areas

City/Area	Population	Percent Minority	Percent Under Age 18	Percent Over Age 64	Percent Linguistically Isolated	Percent w/o High School Diploma	Median Household Income
5 km	436	100	27	6	1	12	$30,586
15 km	8,343	69	28	10	1	11	$38,799
25 km	25,166	79	31	8	1	11	$40,620
Shiprock, NM	6,380	97	29	8	0	9	$29,429
Farmington, NM	37,117	47	30	12	1	9	$56,024
San Juan County	127,517	57	29	11	1	12	$45,822
State of New Mexico	2,013,122	59	25	13	2	11	$46,339

* Population derived assuming uniform population distribution and, therefore, represents an average.

The three radii closest to the proposed facility (5, 15, and 25 km) capture populations above the state and county average for percent minority, and the town of Shiprock also has a higher than County and State average of percent minority population. While the population's minority percentage decreases in the nearby town of Farmington. The 5, 15 and 25 km radii surrounding the proposed facility capture populations below the County and State average for median household income.

[2] U.S. Census Bureau, 2000 and 2010 Data; ESRI, 2012; TANA, 2006; Google, 2012.

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Linguistic isolation limits a household's capacity for civic engagement in the regulatory process.[3] Linguistic isolation is constant, and relatively low percentage, within the 5, 15, and 25 km distances from the Project, and is below the state average for linguistic isolation. The percent of linguistically isolated households in the State of New Mexico is 2%, as compared with the percent of households located within 5, 15 and 25 km of the Project as well as the town of Shiprock and the County of San Juan, which is 1%.[4]

Education level is another factor that may influence susceptibility and vulnerability to air pollution. Limited formal education is a barrier to employment, health care and social resources, and can increase the risk of poverty, stress, and impacts from environmental stressors. The percent of the population over 25 years of age without a high school diploma within a 25 km radius of the Project (11%) is equal to the state average of 11%. The percent of the population without a high school diploma is similar throughout the area and nearby communities surrounding the facility.

Public Participation/Outreach Activities for EPA's Proposed PSD Permit Decision

EPA is undertaking a number of actions to provide public participation opportunities to the community for its proposed PSD permit decision for the FCPP SCR Project.

EPA's proposed permit for the Project, the accompanying Fact Sheet, and the Public Notice will be available for review at the following locations: Navajo Nation EPA; San Juan College in Farmington, NM; Diné College, Shiprock Branch in Shiprock, NM; Shiprock Branch Library in Farmington, NM; and the Nenahnezad Chapter House in Fruitland, NM. Other key documents in EPA's administrative record for the proposed PSD permit, including the permit application, the proposed permit, and EPA's Fact Sheet, are also available for public review on the EPA Region 9 website as well as at the EPA Region 9 office in San Francisco, CA.

EPA has scheduled two public information meetings followed by public hearings for its proposed PSD permit decision: August 27, 2014 at the Nenahnezad Chapter House in Fruitland, New Mexico and August 28, 2014 at the San Juan College in the Henderson Fine Arts building, in Farmington, New Mexico. The purpose of the public information meeting is to provide interested parties with additional information and an opportunity for informal discussion of the proposed Project. The purpose of the public hearings is to provide the public with an additional opportunity to provide oral and/or written comments on EPA's proposed PSD permit for the Project. EPA has also prepared a public information sheet for distribution at the hearings that provides a brief overview of EPA's proposed PSD permitting action for the Project. This handout is available on the EPA Region 9 permit website: http://www.epa.gov/region9/air/permit/r9-permits-issued.html.

The notice of the proposed permit is being provided to the public through a wide variety of methods, including the following: posting on the EPA Region 9 website; publication in the Navajo Times and the Daily Times, Farmington; distribution to a mailing list of those who have requested to be notified by U.S. Mail of any actions related to the Project; and distribution by email to those who have requested to be notified by email. While the percentage of linguistically isolated households is relatively low in the nearby communities and towns, the native Navajo language is Diné Bizaad, and some members of the Diné-speaking population in the nearby communities may prefer to express their comments in their native language at the public hearings. In order to encourage participation and aid attendees who would like to submit their comments in Diné, EPA is providing a Diné interpreter at both public information meetings and public hearings for its proposed PSD permit decision.

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[3] A linguistically isolated household is defined by the U.S. Census Bureau as a household in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well." In other words, all members 14 years old and over have at least some difficulty with English.

[4] San Juan County has one of the highest concentrations in the U.S. of speakers of Native American languages. See Figure 1 of *Native North American Languages Spoken at Home in the United States and Puerto Rico: 2006–2010* at http://www.census.gov/prod/2011pubs/acsbr10-10.pdf.

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Status of Air Quality in the Area
The FCPP is located within the Four Corners Interstate Air Quality Control Region. San Juan County is currently designated as attainment or unclassifiable for all NAAQS: ozone, PM_{10}, $PM_{2.5}$, NO_2, CO, SO_2, and lead.

Impact of Project's Emissions
EPA Region 9's environmental justice analyses for PSD permit decisions usually focus on the potential impacts on minority or low income populations from emissions that may affect the NAAQS that are applicable in the PSD review for the Project. However, the emissions from this Project are below the significant emission rates for all of the NAAQS, and therefore the Project is not subject to PSD review for any NAAQS pollutant. As we noted above, EPA has determined that, in this case, it is appropriate to review potential impacts associated with the increases in SAM emissions from the FCPP, in order to fully consider environmental justice considerations concerning the pollutant regulated under the PSD program that is at issue in the present PSD permitting action. Based on this review, we do not expect the emissions increase of SAM associated with the Project to result in adverse human health impacts to any population, and therefore we do not expect that our action would have disproportionately high and adverse human health or environmental effects on minority or low-income populations, as discussed below.

At elevated concentrations, SAM emissions can form visible plumes. At some other facilities with wet FGD scrubbers like the FCPP, blue SAM plumes have been observed and referred to as plume blight. Physiological responses such as eye irritation and breathing difficulty have been reported for episodes involving visible plumes containing SAM aerosols at ground level.[5] Fine plume problems are expected to occur when SAM vapor or aerosol concentrations leaving the ESP or the wet FGD exceed the equivalent of 2 ppmv. These concentrations have the potential to form aerosols in the plume that will have an adverse effect on plume visibility and appearance[6] – which could then lead to adverse health effects.

In this case, the Applicant's proposed SAM emission rate of 0.00435 lb/MMBtu is equivalent to 1.5 ppmv, and our proposed limit of 0.0025 lb/MMBtu is equivalent to 0.86 ppmv. Given that the Project's emissions will be well below 2.0 ppmv, we do not expect any adverse visible plume effects or adverse air quality or human health impacts associated with SAM emissions from this Project. We also note that the FCPP SCR Project will result in a reduction of 19,000 tpy of NO_X emissions. NO_X emissions are a precursor to ground level ozone which can make it difficult to breathe; cause shortness of breath; inflame and damage airways; and aggravate asthma, emphysema, and chronic bronchitis. This reduction in emissions should be beneficial to any nearby populations, including minority or low-income populations. Based on these factors, EPA has determined that the emissions associated with this Project will not result in adverse human health impacts to any population, and that therefore our action would not result in disproportionately high and adverse human health or environmental effects on disproportionately high and adverse human health or environmental effects on minority populations or low-income populations.

Conclusion

Our analysis indicates that the emissions of the pollutant associated with this Project and regulated under EPA's proposed PSD permit for the Project will not result in adverse human health impacts to any population, and that there will not be disproportionately high and adverse human health or environmental effects with respect to this air pollutant on minority or low-income populations residing near the proposed Project or the community as a whole. We also note that our outreach strategy will make information related to our proposed action more accessible to nearby communities, including potentially linguistically isolated populations that are primarily Diné speaking.

Attachments:

- Map of Median Household Income
- Map of Percent Linguistically Isolated near FCPP
- Map of Percent Minority near FCPP

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[5] See *Identification of (and Responses to) Potential Effects of SCR and Wet Scrubbers on Submicron Particulate Emissions and Plume Characteristics*, EPA-600/R-04-107, August 2004, at 2. Available at: http://nepis.epa.gov/Adobe/PDF/P1000OS8.pdf
[6] Id. at 59.

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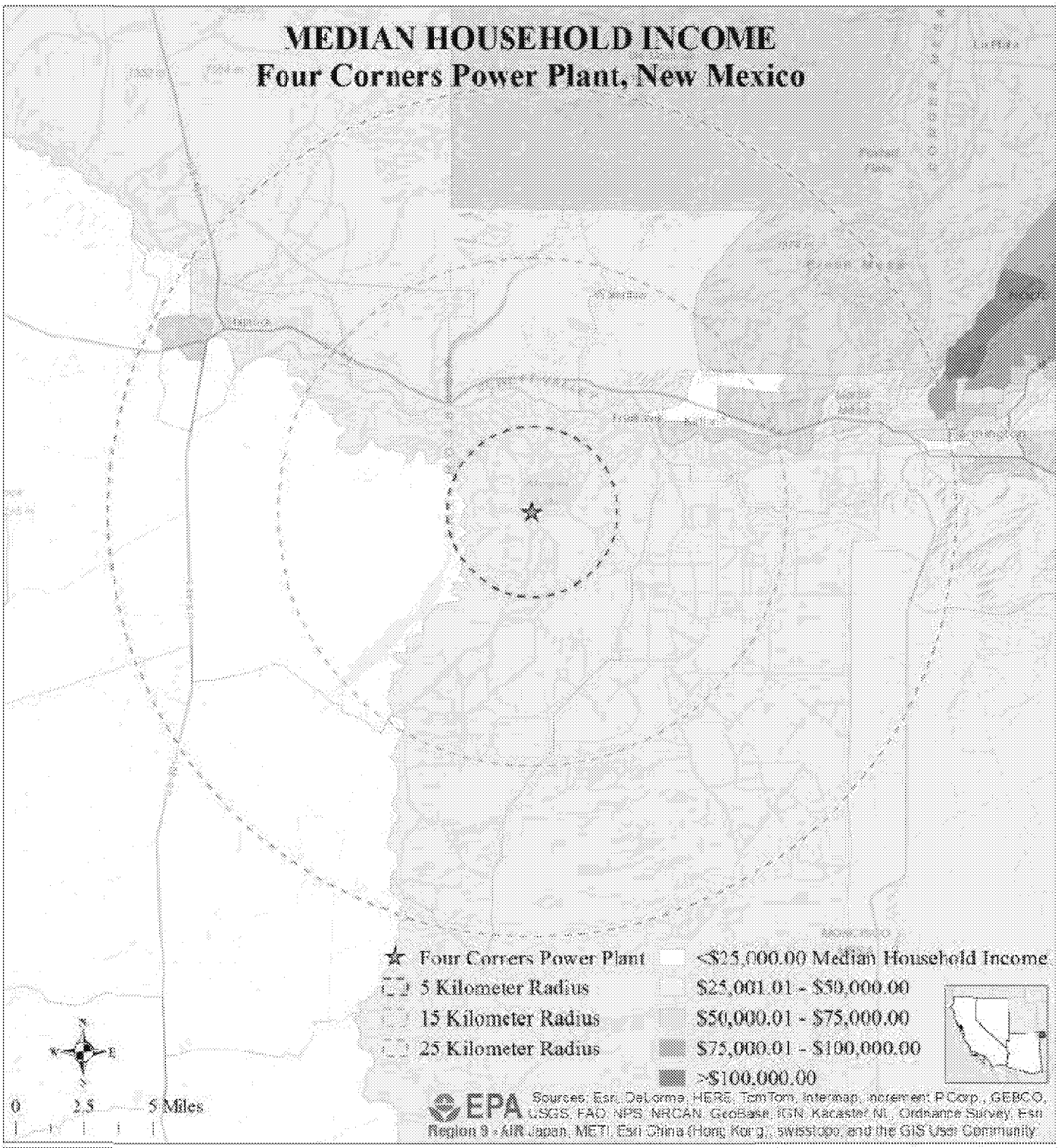
- Map of Percent over 64 near FCPP
- Map of Percent under 18 near FCPP
- Map of Percent without High School Diploma
- Map of Population Density near FCPP

MEDIAN HOUSEHOLD INCOME
Four Corners Power Plant, New Mexico



Radius (KM)	Population	Percent Minority	Percent Under 18	Percent Over 64	Percent Linguistically Isolated Households	Percent without High School Diploma	Median Household Income
0-5	436	100%	27%	6%	1%	12%	$30,586
5-15	8,343	59%	28%	10%	1%	11%	$38,799
15-25	25,166	79%	31%	8%	1%	11%	$40,447
Shiprock	6,380	97%	29%	8%	0%	9%	$29,429
Farmington	37,117	47%	30%	12%	1%	9%	$56,024
San Juan County	127,517	57%	29%	11%	1%	12%	$45,822
New Mexico	2,013,122	59%	25%	13%	2%	11%	$46,339

Additional sources: US Census (2006-2010 American Community Survey for Block Groups), US EPA (2014), IANA (2008).

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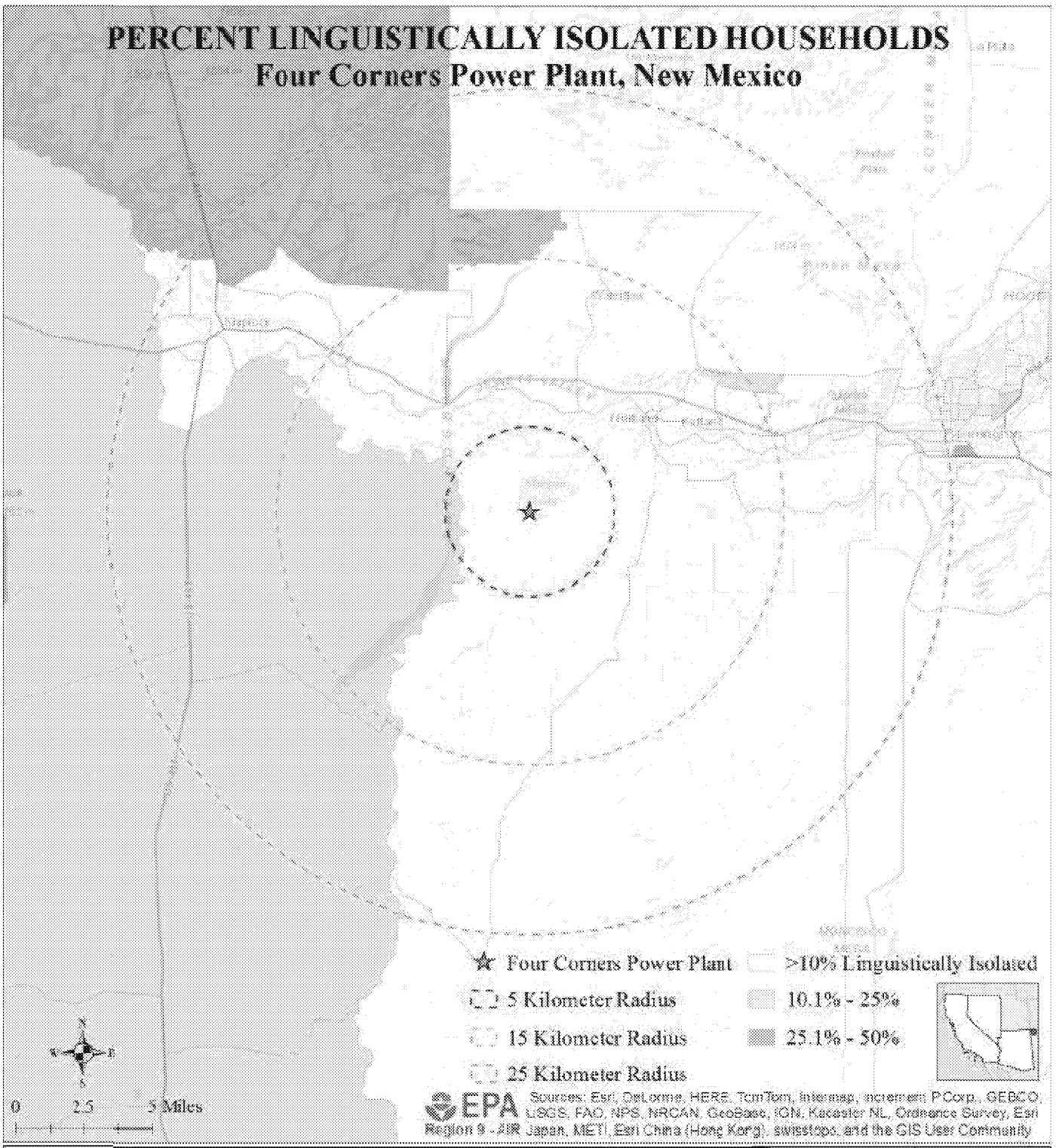
PERCENT LINGUISTICALLY ISOLATED HOUSEHOLDS
Four Corners Power Plant, New Mexico



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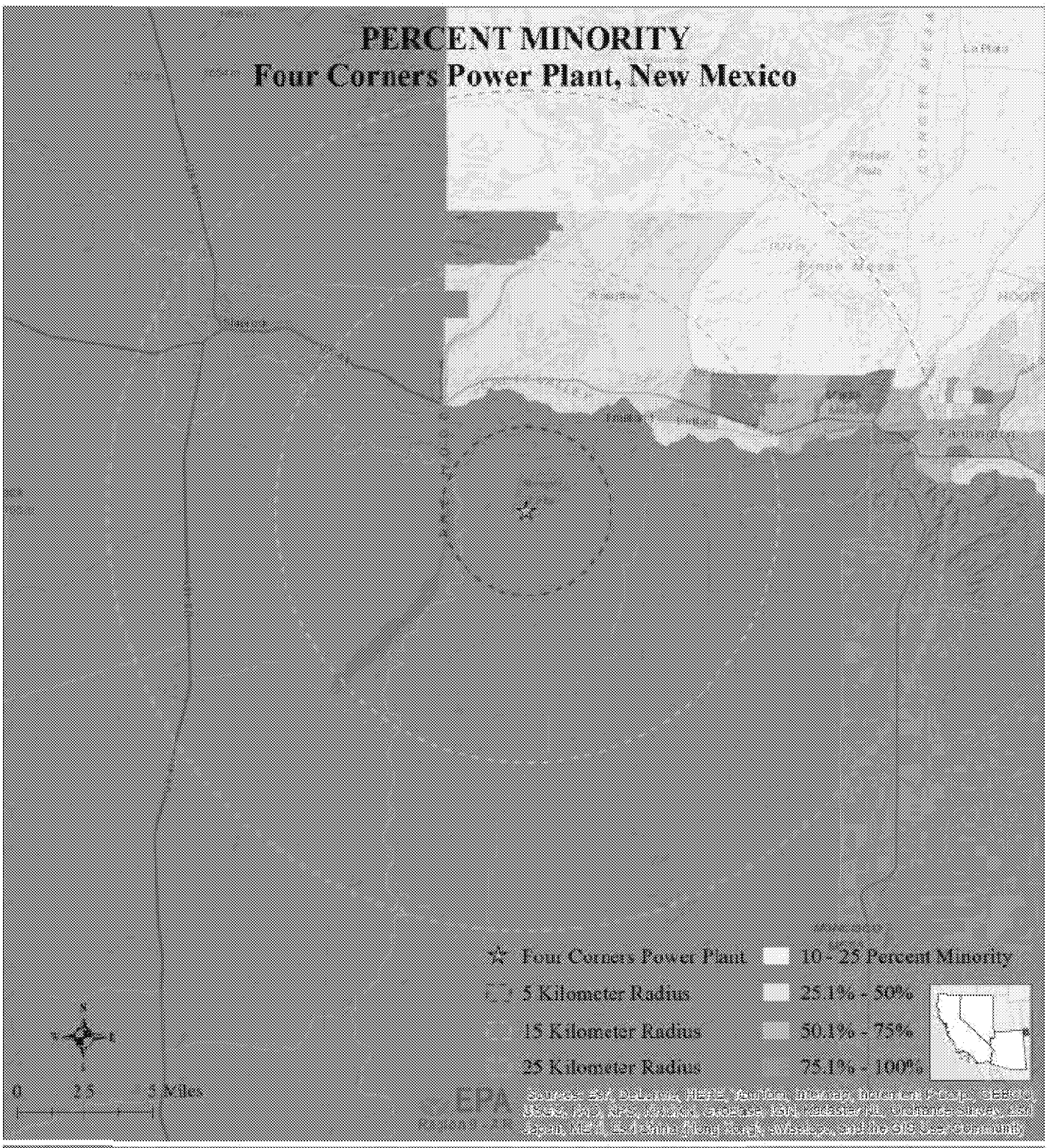

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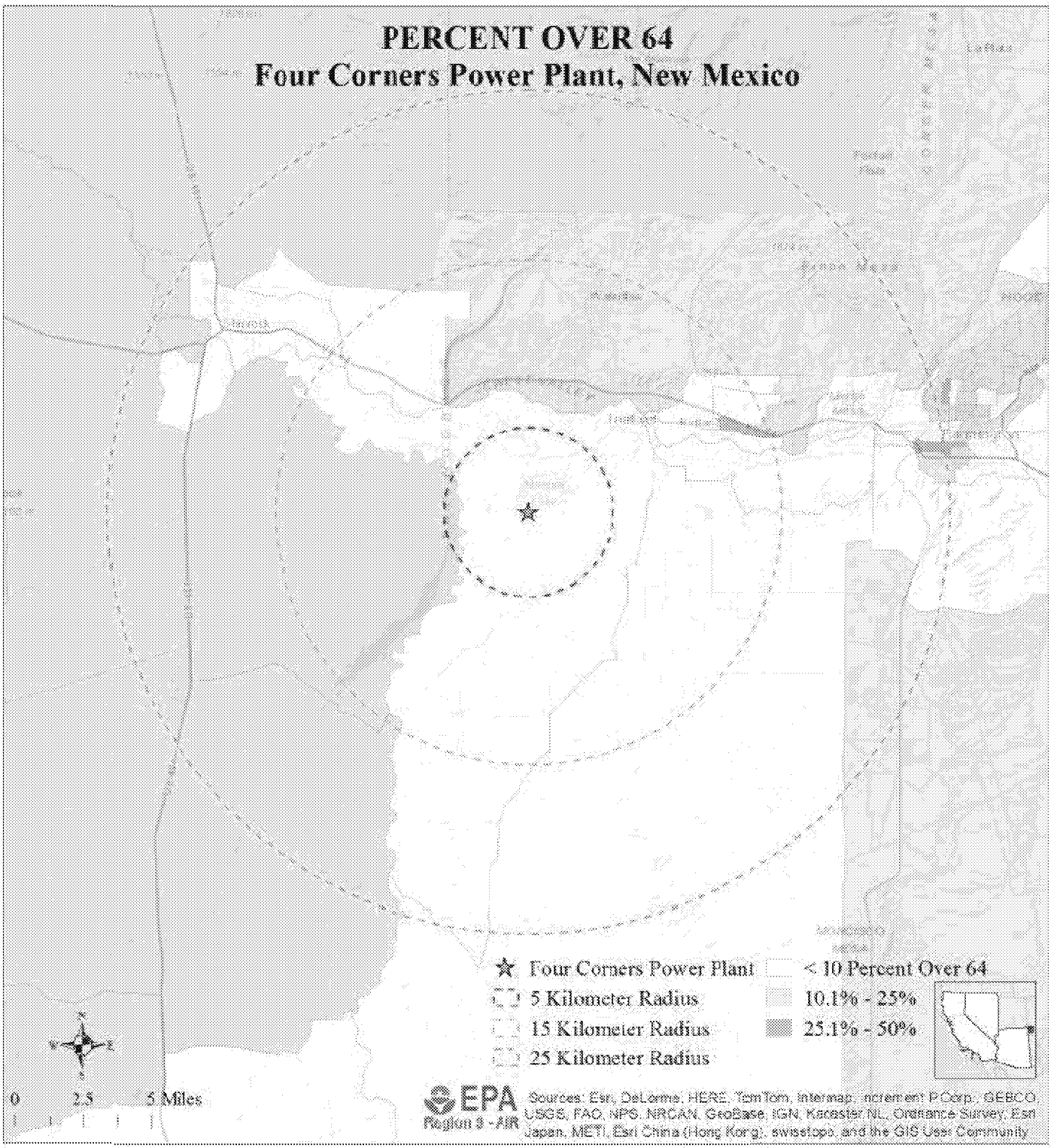
PERCENT OVER 64
Four Corners Power Plant, New Mexico



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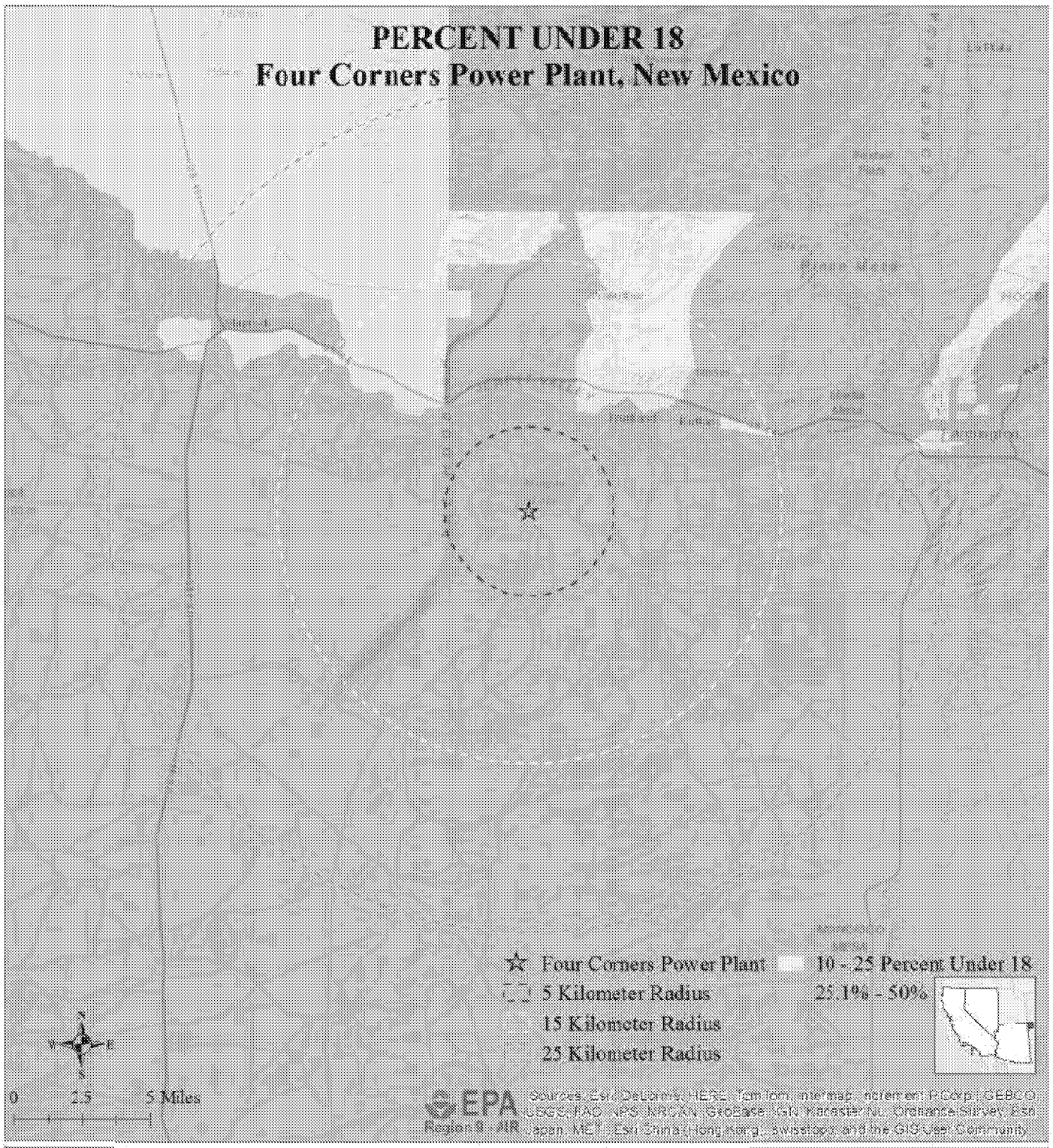
PERCENT UNDER 18
Four Corners Power Plant, New Mexico



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Additional sources: US Census (2006-2010 American Community Survey for Block Groups), US EPA (2014), TANA (2008).

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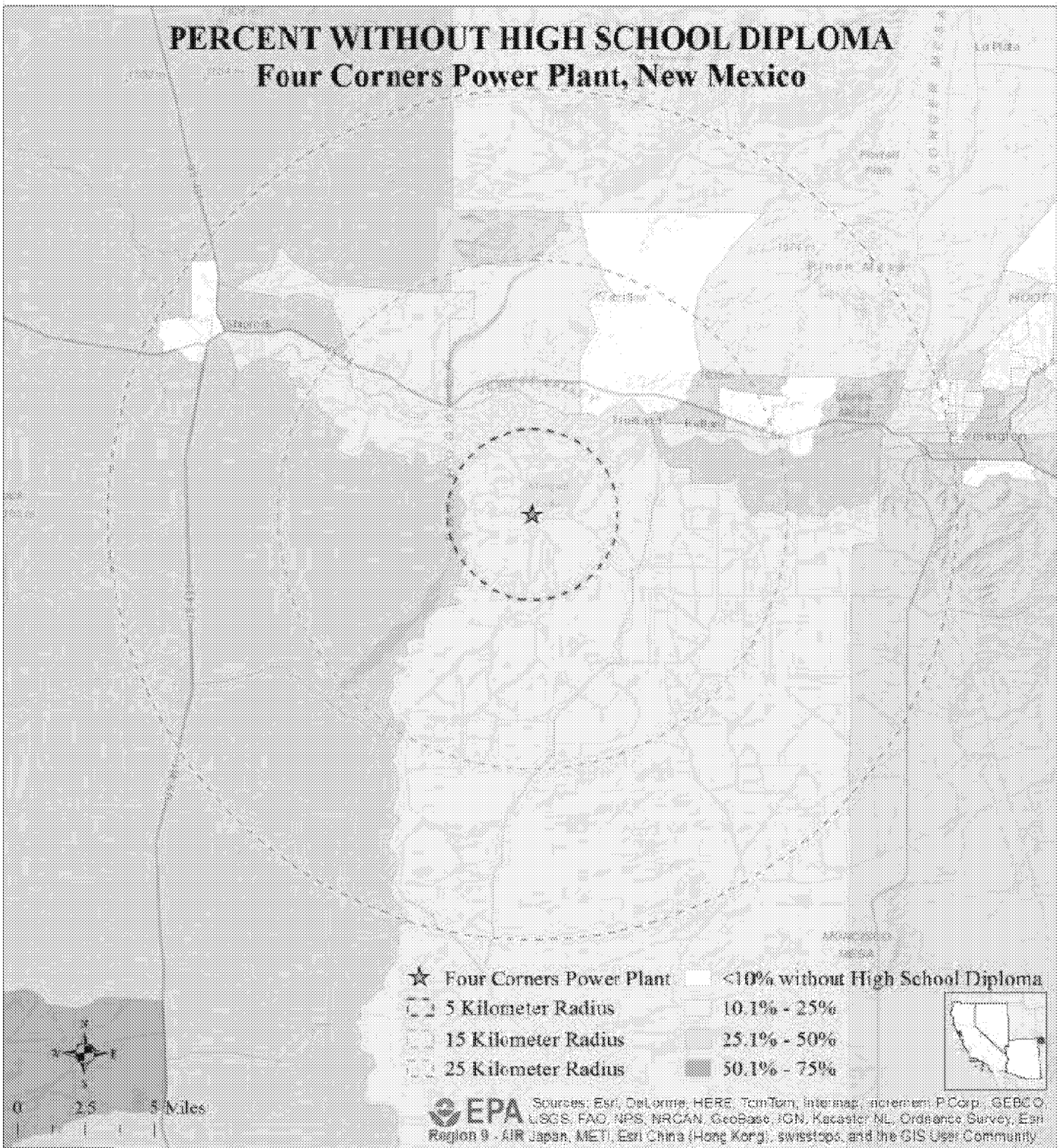
PERCENT WITHOUT HIGH SCHOOL DIPLOMA
Four Corners Power Plant, New Mexico



Radius (KM)	Population	Percent Minority	Percent Under 18	Percent Over 64	Percent Linguistically Isolated Households	**Percent without High School Diploma**	Median Household Income
0-5	436	100%	27%	6%	1%	**12%**	$30,586
5-15	8,343	69%	28%	10%	1%	**11%**	$38,799
15-25	25,166	79%	31%	8%	1%	**11%**	$40,447
Shiprock	6,380	97%	29%	8%	0%	**9%**	$29,429
Farmington	37,117	47%	30%	12%	1%	**9%**	$56,024
San Juan County	127,517	57%	29%	11%	1%	**12%**	$45,822
New Mexico	2,013,122	59%	25%	13%	2%	**11%**	$46,339

Additional sources: US Census (2006-2010 American Community Survey for Block Groups), US EPA (2014), TIANA (2008).

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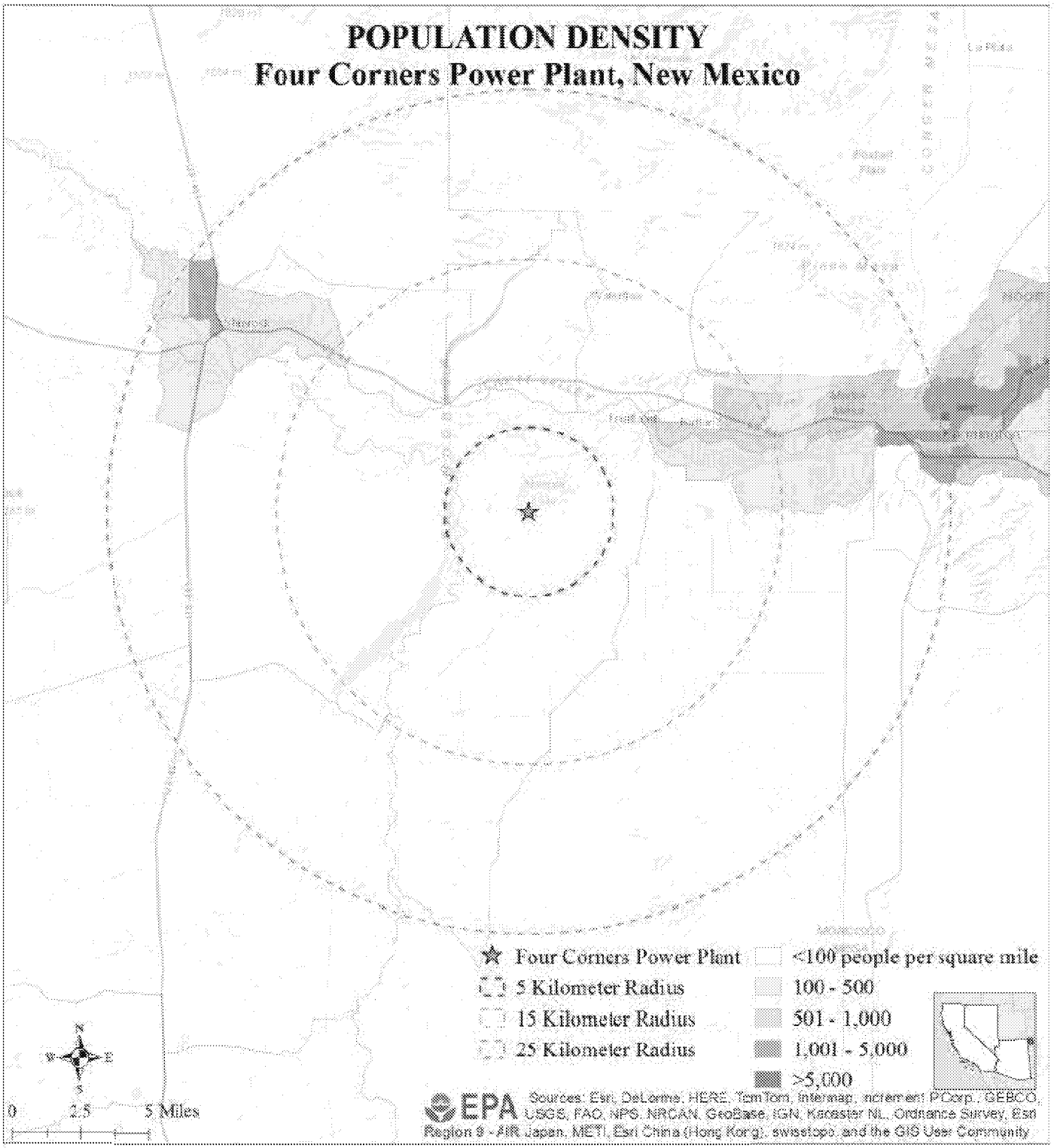
POPULATION DENSITY
Four Corners Power Plant, New Mexico



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Additional sources: US Census (2006-2010 American Community Survey for Block Groups), US EPA (2014), IANA (2008).

AIR1400059 1.mxd (July 7, 2014)