

**FINAL  
ENVIRONMENTAL ASSESSMENT  
FOR THE  
PUBLIC SERVICE COMPANY OF  
NEW MEXICO  
PHOTOVOLTAIC PLUS BATTERY  
FOR SIMULTANEOUS VOLTAGE  
SMOOTHING AND PEAK SHIFTING  
PROJECT, BERNALILLO COUNTY,  
NEW MEXICO**

**U.S. Department of Energy  
National Energy Technology Laboratory**



September 2010



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## COVER SHEET

**Responsible Agency:** U.S. Department of Energy (DOE or the Department)

**Title:** *Final Environmental Assessment for the Public Service Company of New Mexico Photovoltaic Plus Battery for Simultaneous Voltage Smoothing and Peak Shifting Project, Bernalillo County, New Mexico (DOE/EA-1754)*

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**Abstract:** DOE prepared this EA to evaluate the potential environmental impacts of providing a financial assistance grant under the American Recovery and Reinvestment Act of 2009 (Recovery Act) in a cooperative agreement with the Public Service Company of New Mexico (PNM) as part of the Smart Grid Demonstrations Program. If PNM received the funding, the company would install a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system (the proposed project). PNM would also install separately a collocated utility-scale solar photovoltaic array with an output of about 500 kilowatts at its own expense. The goal would be to use the battery, along with a sophisticated control system, to turn solar energy into reliable dispatchable generation resource. This EA analyzes the potential environmental impacts of DOE's proposed action of providing Recovery Act funding and of the No-Action Alternative.

DOE's proposed action is to provide about \$1.8 million in financial assistance in a cost-sharing arrangement to PNM. The cost of the proposed project would be about \$5.9 million.

In this EA, DOE evaluates the impacts to air quality, noise, aesthetics, soils, geology, water resources, biological resources, and cultural resources from DOE's proposed action and PNM's proposed project.

**Availability:** DOE encourages public participation in the NEPA process. A Notice of Availability (NOA) was in the *Albuquerque Journal* on August 8, 9, and 10, 2010. The draft EA was available for public review on DOE's National Energy Technology Laboratory (NETL) web site and at the *Albuquerque/Bernalillo County Library System* beginning August 6, 2010. This final EA is available on DOE's National Energy Technology Laboratory (NETL) web site, <http://www.netl.doe.gov/publications/others/nepa/ea.html>, and NEPA web site [http://nepa.energy.gov/DOE\\_NEPA\\_documents.htm](http://nepa.energy.gov/DOE_NEPA_documents.htm).

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## ACRONYMS AND ABBREVIATIONS

CFR	<i>Code of Federal Regulations</i>
DOE	U.S. Department of Energy
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
FR	<i>Federal Register</i>
USFWS	U.S. Fish and Wildlife Service
NEPA	National Environmental Policy Act of 1969, as amended
NHRP	<i>National Register of Historic Places</i>
PNM	Public Service Company of New Mexico
PM <sub>10</sub>	particulate matter with median aerodynamic diameter of 10 micrometers or less
PM <sub>2.5</sub>	particulate matter with median aerodynamic diameter of 2.5 micrometers or less
SHPO	State Historic Preservation Officer
Stat.	<i>United States Statutes at Large</i>
U.S.C.	<i>United States Code</i>

Note: Numbers in this EA are generally rounded to two or three significant figures. Therefore, some total values might not equal the actual sums of the values.

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## SUMMARY

The U.S. Department of Energy (DOE or the Department) proposes to award a financial assistance grant under the American Recovery and Reinvestment Act of 2009 (Recovery Act) in the form of a cooperative agreement with the Public Service Company of New Mexico (PNM). The financial assistance grant is for PNM's proposed project to install the following: (1) a 2 to 4 megawatt-hour advanced absorbed valve-regulated lead acid battery; (2) an access road; (3) a parking lot; and (4) a 3,000-foot underground electrical tie-in to the existing power distribution system. PNM would also install a collocated photovoltaic solar array with an output of about 500 kilowatts at its own expense. The company would use the battery, along with a sophisticated control system, to turn solar energy into a reliable, dispatchable generation resource. DOE's proposed action is to award a \$1.8 million financial assistance grant to PNM in a cost-sharing arrangement. The cost of the proposed project would be about \$5.9 million.

This environmental assessment (EA) examines the potential environmental consequences of DOE's proposed action, providing financial assistance, and PNM's proposed project. The EA also examines the No-Action Alternative under which DOE assumes that, because of its denial of financial assistance, PNM would not proceed with the project.

DOE evaluated the environmental resource categories it commonly addresses in EAs and identified no adverse effects from the proposed project. For the resource categories waste; utilities, energy, and materials; noise; occupational health and safety; aesthetics and visual resources; and transportation, DOE determined there would be no impacts or the potential impacts would be small, temporary, or both and therefore did not carry those forward for additional analysis. DOE focused its analyses on those resources that could require new or amended permits, have the potential for environmental impacts or controversy, or typically interest the public, such as socioeconomics and historic and cultural resources. DOE performed detailed analyses of potential impacts to air quality; water resources; land use; biological resources and soils; historic and cultural resources; and socioeconomics and environmental justice. The following paragraphs summarize the analyses.

Air Quality. During construction, air emissions would include combustion emissions from vehicles and heavy-duty equipment and fugitive dust from site preparation activities. These emissions would have short-term adverse impacts that PNM would mitigate through best management practices. Operation of the battery as well as the solar array would not generate air emissions.

The collocated solar array would add about 500 kilowatts of electricity for 20 or more years with no increase in greenhouse gas emissions. Operating this renewable energy project would not generate carbon dioxide and could result in a decrease in carbon dioxide emissions from regional power plants. Therefore, the proposed project would have no cumulative carbon impact.

Water Resources. Site preparation and construction could result in storm water runoff and soil erosion. PNM would design the slope of the site, if necessary, to direct runoff away from Tijeras

Arroyo and implement a soil erosion management plan. The company would truck in water to spray disturbed soils to suppress dust. PNM would likely need to cross an unnamed arroyo in the area during construction and would obtain the necessary Section 404 permits from the U.S. Army Corps of Engineers. The proposed project would not require potable or process water for operations. PNM would not use surface water or discharge wastewater, nor would they need permits for operations.

The proposed project would not use groundwater for operations, and there would be no underground storage tanks for the proposed project. PNM would prevent or mitigate the small potential for impacts from spills of oil and gas under its existing spill prevention and mitigation plan. The advanced absorbed valve-regulated lead acid battery would include hazardous and toxic substances in the form of electrolyte gel; however, the battery system was designed to contain 100 percent of the gel in an accidental release. Therefore, DOE does not expect impacts to groundwater or the Tijeras Arroyo from operations.

The proposed site is not in a designated 100-year floodplain, and there are no wetlands on the proposed site.

Land Use. Site preparation and construction would occur on an 8-acre area within a larger PNM-owned 27-acre parcel. The site would change from undeveloped to hosting the battery and other features of the proposed project. Changes to the land would include an access road, internal site roads, and a 3,000-foot underground electrical tie-in from the battery to the existing power distribution system. PNM would regenerate any disturbed areas not covered by project facilities with species indigenous to the region. Other than the existence of the above-described features, operations would not entail further land use impacts. The nearby Mesa del Sol mixed-use community is a green community that includes solar companies and other compatible land uses. DOE does not expect changes to land use near the proposed project site.

Biological Resources and Soils. During construction, wildlife could avoid the project area due to noise and human activity. Some wildlife deaths could occur because of the vehicles and construction equipment. Habitat disruption would be limited to the 8-acre project site and the route of the underground tie-in to the existing power distribution system. DOE determined no suitable habitat for threatened or endangered species occurs on the site. Because of the battery design, all hazardous and toxic materials would be self-contained within the battery enclosure and would be unlikely to result in accidental discharges to the Rio Grande River. Based on this information, DOE determined that there would be no effects to federally listed threatened, endangered, or candidate species. DOE consulted with the U.S. Fish and Wildlife Service (USFWS).

In relation to migratory birds, if any construction activities occurred during the nesting season, PNM would survey the site to ensure there were no active migratory bird's nests present. If that survey found nests, PNM would take steps to avoid impacts or develop mitigation plans if necessary.

Impacts to biological resources from operations would be unlikely, with the possible exception of occasional vehicle-related wildlife incidents and limited noise during site visits. Routine operational emissions or discharges would not occur, and PNM would have plans in place to manage accidental releases. There would be no operations-related soil disturbances, so there would be no impacts to soils.

Historic and Cultural Resources. There are no known historic or cultural resources in the areas PNM would disturb. The company has designed the project to avoid disturbances to one previously identified site that is eligible for inclusion in the *National Register of Historic Places*. The company would monitor activities throughout construction and operations to ensure avoidance of the known sites. If PNM found cultural deposits during project activities, it would stop work immediately and notify the New Mexico State Historic Preservation Officer (SHPO) and its own Environmental Services Department. DOE consulted the New Mexico State Historic Preservation Officer and interested Native American tribes. DOE determined there would be no impacts to federally listed or eligible historic properties. The Pueblo of Laguna responded and agreed with DOE's determination.

Socioeconomics and Environmental Justice. The proposed project would be unlikely to create direct jobs except during the short 4-month construction period, so there would be no changes to population, infrastructure, or the level of social services in the area. There would be indirect economic consequences because vendors and equipment suppliers would benefit from the capital orders for the battery, solar array, and support systems. The positive economic benefits would be small.

The evaluation of impacts to environmental justice is dependent on determining if high and adverse impacts from the proposed project would disproportionately affect low-income or minority populations. DOE determined that no high and adverse impacts would occur to any member of the community, including socioeconomic impacts, so there would be no high and adverse impacts to any minority or low-income population.

Cumulative Impacts. PNM has present (ongoing) actions to reduce use of carbon-based fuels and greenhouse gas emissions, to increase the use of renewable energy sources such as solar and wind energy and biogas power, and to increase energy efficiency. The PNM initiatives would have net beneficial cumulative impacts. The proposed project would be part of and consistent with those initiatives and would therefore contribute in a small way to those positive benefits.

The contribution of PNM's proposed project to potential cumulative effects in relation to the Mesa del Sol master-planned community and the Journal Pavilion open-air concert venue would be small, temporary, or both. The monetary investment in the proposed project would result in indirect beneficial impacts to the region. Given the size of the regional economy, the impacts would be small. There would be no contributions to operational air or water impacts, or adverse effects on threatened or endangered species. PNM would avoid cultural resources so there would be no cumulative impacts to or disruption of such resources. The proposed project would

increase the amount of land converted from undeveloped to other uses by 8 acres. Disruption due to the underground electrical tie-in would be temporary in that the disrupted corridor would revert to indigenous vegetation.

PNM's reasonably foreseeable actions would continue the company's initiatives to reduce use of carbon-based fuels and emissions of greenhouse gases, to increase the use of renewable energy sources such as solar and wind energy and biogas power, and to increase energy efficiency.

The proposed project would be consistent with the goals of the Mesa del Sol master-planned community in terms of being an environmentally friendly community that uses renewable energy sources and other green technologies.

No-Action Alternative. DOE assumed for the EA analyses that PNM would not proceed with the project without DOE assistance. Therefore, there would be no impacts to any resource category from the No-Action Alternative. The small, positive socioeconomic impacts, the potential to reduce new conventional power plant construction, and the potential reduction in greenhouse gases would also not occur under the No-Action Alternative. In addition, DOE's ability to achieve its objectives under the Smart Grid Demonstrations Program and the Recovery Act would be impaired.

## 1. INTRODUCTION

As part of the American Recovery and Reinvestment Act of 2009 (the Recovery Act; Public Law 111-5, 123 Stat. 115), the U.S. Department of Energy (DOE or the Department) National Energy Technology Laboratory, on behalf of the Office of Electricity Delivery and Energy Reliability's Smart Grid Demonstrations Program, is providing up to \$435 million in financial assistance through competitively awarded grants for the deployment of Smart Grid Demonstration projects. These projects verify technology viability, quantify costs, validate new business models at a scale that can be readily adapted and replicated around the country, and develop new and innovative forms of energy storage. The funding of the selected projects requires compliance with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.), Council on Environmental Quality regulations (40 CFR Parts 1500 to 1508), and DOE NEPA implementing procedures (10 CFR Part 1021).

To comply with NEPA, DOE prepared this *Final Environmental Assessment for the Public Service Company of New Mexico Photovoltaic Plus Battery for Simultaneous Voltage Smoothing and Peak Shifting Project, Bernalillo County, New Mexico* (EA). It examines the potential environmental consequences of DOE's proposed action—providing financial assistance to the project—and the Public Service Company of New Mexico's (PNM) proposed project—installation of a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system. In addition, PNM would install, at its own expense, a collocated photovoltaic solar array with an output of about 500 kilowatts. The combination of the battery and array, along with a sophisticated control system, would turn solar energy into a reliable, dispatchable distributed-generation resource. The EA also examines the No-Action Alternative, under which DOE assumes that, as a consequence of its denial of financial assistance, PNM would not proceed with the project.

This chapter explains NEPA and related regulations (Section 1.1), the background of the Smart Grid Demonstrations Program (Section 1.2), the Department's purpose and need for action (Section 1.3), the environmental resources DOE did not analyze in detail (Section 1.4), and the consultation and public comment process (Section 1.5). Chapter 2 discusses DOE's proposed action, PNM's proposed project, the No-Action Alternative, and DOE's Alternative Actions. Chapter 3 details the affected environment and the potential environmental consequences of the proposed project and of the No-Action Alternative, and it considers resource commitments. Chapter 4 addresses cumulative impacts, and Chapter 5 provides DOE's conclusions from the analyses. Chapter 6 lists the references for this document. Appendix A contains the distribution list, and Appendix B contains correspondence between DOE, the New Mexico State Historic Preservation Officer (SHPO), tribal leaders of eight interested Native American tribes, and the USFWS. Appendix C contains a copy of a recent biological survey in and around the proposed project site. Appendix D contains a copy of an environmental synopsis for projects of this type that DOE used in the evaluation of this proposed project.

## 1.1 National Environmental Policy Act and Related Regulations

In accordance with DOE NEPA implementing procedures, DOE must evaluate the potential environmental impacts of a proposed action that could have a significant impact on human health and the environment including decisions on whether to provide financial assistance to states and private entities. In compliance with these regulations and DOE's procedures, this EA:

- Examines the potential environmental impacts of the proposed action and the No-Action Alternative;
- Identifies unavoidable adverse environmental impacts of the proposed action;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterizes any irreversible and irretrievable commitments of resources that would be involved if DOE decided to implement its proposed action.

DOE must meet these requirements before it can make a final decision to proceed with a proposed federal action that could cause adverse impacts to human health or the environment. This EA fulfills DOE's obligations under NEPA and provides DOE with the information needed to make an informed decision about helping to finance the installation of PNM's proposed project in Bernalillo County, New Mexico.

This EA evaluates the potential individual and cumulative impacts of the proposed project. No other action alternatives are analyzed. For purposes of comparison, this EA also evaluates the impacts that could occur if DOE did not provide funding (the No-Action Alternative), under which DOE assumes that PNM would not proceed with the project. This assumption allows DOE to compare the impacts of an alternative in which the project occurs with one in which it does not.

## 1.2 Background of the Smart Grid Demonstrations Program

DOE's National Energy Technology Laboratory and the Office of Electricity Delivery and Energy Reliability manage the research and development portfolio of the Smart Grid Demonstrations Program. Its mission is to lead national efforts to modernize the electrical grid; enhance the security and reliability of the energy infrastructure; and improve recovery from disruptions to electricity supply. The Smart Grid Demonstrations Program will help verify the technological and business viability of new technologies and show how fully integrated smart grid systems can be readily adapted and copied around the country. Further, implementation of smart grid technologies could reduce electricity use by more than 4 percent by 2030. It is estimated that during that time span smart grid technologies can save U.S. businesses and consumers about \$20.4 billion in electricity costs (DOE 2009).



Congress appropriated funding for the Smart Grid Demonstrations Program in the Recovery Act to stimulate the economy and reduce unemployment in addition to furthering the existing objectives of the program. DOE solicited applications for this funding by issuing a competitive Funding Opportunity Announcement (DE-FOA-0000036), “Recovery Act: Smart Grid Demonstrations,” on June 25, 2009. The announcement invited applications in two areas of interest:

- Area of Interest 1, Smart Grid: Regionally unique demonstration projects to quantify smart grid costs, benefits, and cost-effectiveness; to verify smart grid technology viability; and to validate new smart grid business models at a scale that can be readily adapted and replicated around the county. Smart grid technologies of interest include advanced digital technologies for use in planning and operation of the electric power system and the electricity markets such as microprocessor-based measurement and control, communications, computing, and information.
- Area of Interest 2, Energy Storage: Demonstrations projects for major, utility-scale energy storage installations to help establish costs and benefits, to verify technical performance, and to validate system reliability and durability at scales that can be readily adapted and replicated across the United States. Energy storage systems include advanced battery systems (including flow batteries), ultra capacitors, flywheels, and compressed air energy systems. Application areas include wind and photovoltaic integration with the grid; upgrade deferral of transmission and distribution assets; congestion relief; and system regulation.

DOE prepared an environmental synopsis to evaluate and provide a comparison of potential environmental impacts for each proposal it deemed to be within the competitive range. The Department used the synopsis to evaluate appreciable differences in the potential environmental impacts from those proposals. The synopsis included: (1) a brief description of background information for the Smart Grid Demonstration area of interest; (2) a general description of the proposals DOE received in response to the Funding Opportunity Announcement and deemed to be within the competitive range; (3) a summary of the assessment approach DOE used in the initial environmental review to evaluate the potential environmental impacts associated with the proposals; and (4) a summary of the environmental impacts that focused on potential differences among the proposals. Appendix D contains a copy of the environmental synopsis for Area of Interest 2.

On November 24, 2009, DOE announced its selections of 16 projects in Area of Interest 1 and 16 projects in Area of Interest 2 based on the evaluation criteria in the funding opportunity announcement and giving special consideration to projects that promoted the objectives of the Recovery Act—job preservation or creation and economic recovery—in an expeditious manner.

PNM’s proposed project, installation and operation of an absorbed valve-regulated lead-acid storage battery, was one of the 16 projects DOE selected for funding under Area of Interest 2.

The company would use the battery, along with a sophisticated control system, to turn solar energy into a reliable, dispatchable generation resource. DOE's proposed action is to provide PNM with about \$1.8 million in financial assistance in a cost-sharing arrangement. The total cost of the proposed project would be about \$5.9 million.

### **1.3 Purpose and Need for DOE Action**

In June 2009, the Department initiated a process to identify suitable projects to lead the way for deploying integrated smart grid systems by issuing Funding Opportunity Announcement DE-FOA-00000036, "Recovery Act: Smart Grid Demonstrations." This funding opportunity announcement was funded under the Recovery Act.

The purpose of the proposed action is to support the objectives of the Smart Grid Demonstrations Program—to demonstrate advanced smart grid technologies and integrated systems that will help build a smarter, more efficient, more resilient electrical grid—and the goals of the Recovery Act. The Program will help verify smart grid technology viability, quantify smart grid costs and benefits, and validate new smart grid business models at a scale that can be readily adapted and replicated around the country. DOE considers PNM's proposed project to be one that can meet these objectives because it would (1) increase power quality and reliability in its service area, (2) reduce impacts associated with carbon emissions, (3) increase energy security through reduced oil consumption, and (4) further national knowledge and technology of new renewable energy-generating and peak-shifting systems.

The Recovery Act seeks to create jobs, restore economic growth, and strengthen America's middle class through measures that modernize the nation's infrastructure, enhance America's energy independence, expand educational opportunities, preserve and improve affordable health care, provide tax relief, and protect those in greatest need. The Recovery Act provided DOE with the monies it is using for grants in the Smart Grid Demonstrations Program.

There has been chronic underinvestment and parochialism in getting energy where it needs to go through new transmission and distribution systems, further limiting grid efficiency and reliability. DOE's proposed action of providing this project with funding would help initiate modernization of a small portion of the nation's electrical grid system.

### **1.4 Environmental Resources Not Carried Forward**

Chapter 3 of this EA describes the affected environment and examines the potential environmental impacts of the proposed project, associated actions, and the No-Action Alternative for the following resource areas:

- Air quality;
- Water resources;
- Land use;
- Biological resources and soils;

- Historic and cultural resources; and
- Socioeconomics and environmental justice.

The focus of the more detailed analyses in Chapter 3 is on those resources that could require new or amended permits, have the potential for significant impacts or controversy, or typically interest the public, such as socioeconomics and historical and cultural resources.

DOE EAs also commonly address the environmental resource areas listed in Table 1-1. However, in an effort to streamline the NEPA process and enable a timely award to the selected project, DOE did not examine the resource areas in the table at the same level of detail as the above-mentioned six areas. Table 1-1 describes the Department’s evaluation of those resource areas. In each case, there would be no impacts or the potential impacts would be small or temporary in nature, or both. Therefore, DOE determined that further analysis is unnecessary. In terms of the No-Action Alternative, the potential impacts Table 1-1 lists would not occur because DOE assumes the proposed project would not proceed.

**Table 1-1.** Environmental resource areas with no, small, or temporary impacts.

Environmental resource area	Impact consideration and conclusions
Waste	<p>Site preparation and construction would generate small amounts of construction-related wastes such as packaging materials, concrete residues, and earthen materials. PNM would send these wastes to a disposal facility such as the City of Albuquerque municipal waste facility (Horn 2009). The amount of waste would not affect local landfill capacities.</p> <p>The advanced absorbed valve-regulated battery would contain an electrolyte gel, the ingredients of which include inorganic lead, sulfuric acid, antimony, arsenic, tin, and polypropylene. The ingredients are sealed within the battery cell; the battery would meet all regulations to be classified as nonspillable. The battery would generate no hazardous waste and, if needed, the vendor has a state-of-the-art recycling program.</p>
Utilities, energy, and materials	<p>The proposed project would not affect community infrastructure or facilities. The addition of up to 500 kilowatts of electricity from the PNM-funded solar panels could result in comparable reductions in the generation of greenhouse gases. Materials would include the electrolyte gel, but it would not need replacement as part of normal operations and maintenance (Horn 2009).</p>
Noise	<p>The site is on undeveloped land with no nearby permanent receptors. Most noise impacts would occur during construction and be short term. Noise from operations would occur only from a small amount of traffic visiting the facility for inspections or maintenance.</p>
Occupational health and safety	<p>The construction of the facility would require a small work force for the short 4-month construction phase. DOE expects that potential worker accidents would remain within the national averages for construction activities. During operations, there would be no full-time workers on the site. PNM would construct and operate the facility in accordance with its existing company occupational health and safety plans.</p>

**Table 1-1.** Environmental resource areas with no, small, or temporary impacts (continued).

Environmental resource area	Impact consideration and conclusions
Occupational health and safety (continued)	There would be very little potential for worker accidents in relation to hazardous or toxic materials during operations because the battery system would be completely enclosed and designed to contain 100 percent of the contents in the event of a release. Hazardous or toxic materials would include the advanced electrolyte gel.
Aesthetics and visual resources	The proposed site is not near visually sensitive areas. Views from Interstate Highway 25 and the general vicinity of the proposed project site would consist of background landscapes only. In a 1999 environmental impact statement, DOE characterized the lands adjacent to the proposed project site and the Mesa del Sol area as Scenic Class 8, Low Public Value (DOE 1999). The battery enclosure system and solar array would result in an alteration to the existing landscape. The solar panels would be from 4 to 8 feet in height. The facility would be visible from Interstate 25 and Los Picaros Road.
Transportation	Construction and installation equipment and workers would travel to the site along Los Picaros Road, which would result in a minimal increase in traffic. Operations traffic would consist primarily of occasional visits for maintenance and inspection.

## 1.5 Consultations and Public Comments

### 1.5.1 Consultations

Before the release of the EA for public comment, DOE sent project information to the New Mexico SHPO, USFWS, and eight interested Native American tribes for their consideration.

#### **New Mexico State Historic Preservation Officer**

On July 1, 2010, DOE sent a formal consultation letter to the New Mexico SHPO in accordance with the review requirements of Section 106 of the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.), and implementing regulations at 36 CFR Part 800. The letter detailed DOE's investigation of nearby historic properties and concluded that no historic properties would be affected by the proposed project. The New Mexico State Historic Preservation Officer responded on August 19, 2010, by returning DOE's letter stamped with, "No Historic Properties Affected." Appendix B contains copies.

#### **U.S. Fish and Wildlife Service**

On July 12, 2010, DOE sent a formal consultation letter to the USFWS in accordance with the review requirements of Section 7 of the Endangered Species Act. The USFWS responded on August 3, 2010, and concurred with DOE's determination that the proposed project is not likely to adversely affect threatened and endangered species.

## **Native American Tribes and Pueblos**

On July 14, 2010, DOE sent letters to eight Native American tribes and pueblos to inform them of the project and to request their input on potential cultural or archaeological resources. Appendix B contains a copy of that letter and the responses DOE received. The Pueblo of Laguna responded and concurred with DOE's determination of no impacts to cultural properties. The Department also received a response from the Hopi Tribe after publication of the Draft EA. The tribe responded that if the lithic scatter on the site, which is eligible for the *National Register of Historic Places*, was avoided and protected, then there would be no historic properties affected.

### **1.5.2 Comment-Response Process**

DOE issued the Draft EA for comment on August 6, 2010, and advertised its release in the *Albuquerque Journal* on August 8, 9, and 10. In addition, the Department sent a copy for public review to the Albuquerque/Bernalillo County Library System. The Department established a 21-day public comment period that began August 8, 2010, and ended August 28, 2010, and announced it would accept comments by mail, email, or facsimile. DOE received one comment letter (Appendix B contains a copy).

U.S. Environmental Protection Agency, Region 6  
Debra A. Griffin, Associate Director  
Compliance Assurance and Enforcement Division

#### Comment

*Section 3.1.1 notes that "EPA has designated Bernalillo County as an attainment area for all criteria pollutants" as of 2010. While it is true that the area is not currently in nonattainment of any criteria pollutant standards, Albuquerque/Bernalillo County was classified as a moderate carbon monoxide (CO) nonattainment area under the 1990 Clean Air Act amendments. EPA redesignated the area to attainment of the CO standard in June 1996 (61 FR 29970). This redesignation began a 20-year period of maintenance for the area, during which the area must not show any degradation of air quality from CO attainment levels.*

*The provisions of 40 CFR 93 (General Conformity with the Clean Air Act) apply to criteria pollutant nonattainment and maintenance areas. Under 40 CFR 93.153 (Applicability Analysis), de minimis CO emissions levels of 100 tons/year (tpy) serve as a threshold for determining whether or not a more intensive general conformity analysis must be conducted for a federally funded project in a criteria pollutant maintenance area. If project emissions are not expected to exceed 100 tpy of CO, the requirements for general conformity analysis are satisfied. Please include a comparison of anticipated project CO emissions with the de minimis CO emissions level of 100 tpy in your environmental analysis.*

Response

DOE determined in Section 3.1.2.1 of the EA that the “operation of the battery as well as the solar array would not generate air emissions. Because the proposed project would not cause emissions of criteria pollutants or their precursors, no conformity determination under the Clean Air Act (42 U.S.C. 7401 et seq.) would be necessary.”

Comment

*The EA provides a clear analysis of any possible environmental justice implications of this proposed project, as well as potential impacts on local Indian Tribes. The EA shows that this project will not have any disproportionate or adverse effects on either low-income or minority groups, on Tribal residents, or on Tribal governments.*

Response

Thank you for your comment.

## 2. DOE PROPOSED ACTION AND ALTERNATIVES

This chapter describes DOE's proposed action (Section 2.1); PNM's proposed project (Section 2.2); the No-Action Alternative (Section 2.3); and DOE Alternative Actions (Section 2.4).

### 2.1 DOE's Proposed Action

DOE's proposed action is to award a financial assistance grant under the Recovery Act of about \$1.8 million. PNM estimates the total cost of its proposed project would be about \$5.9 million.

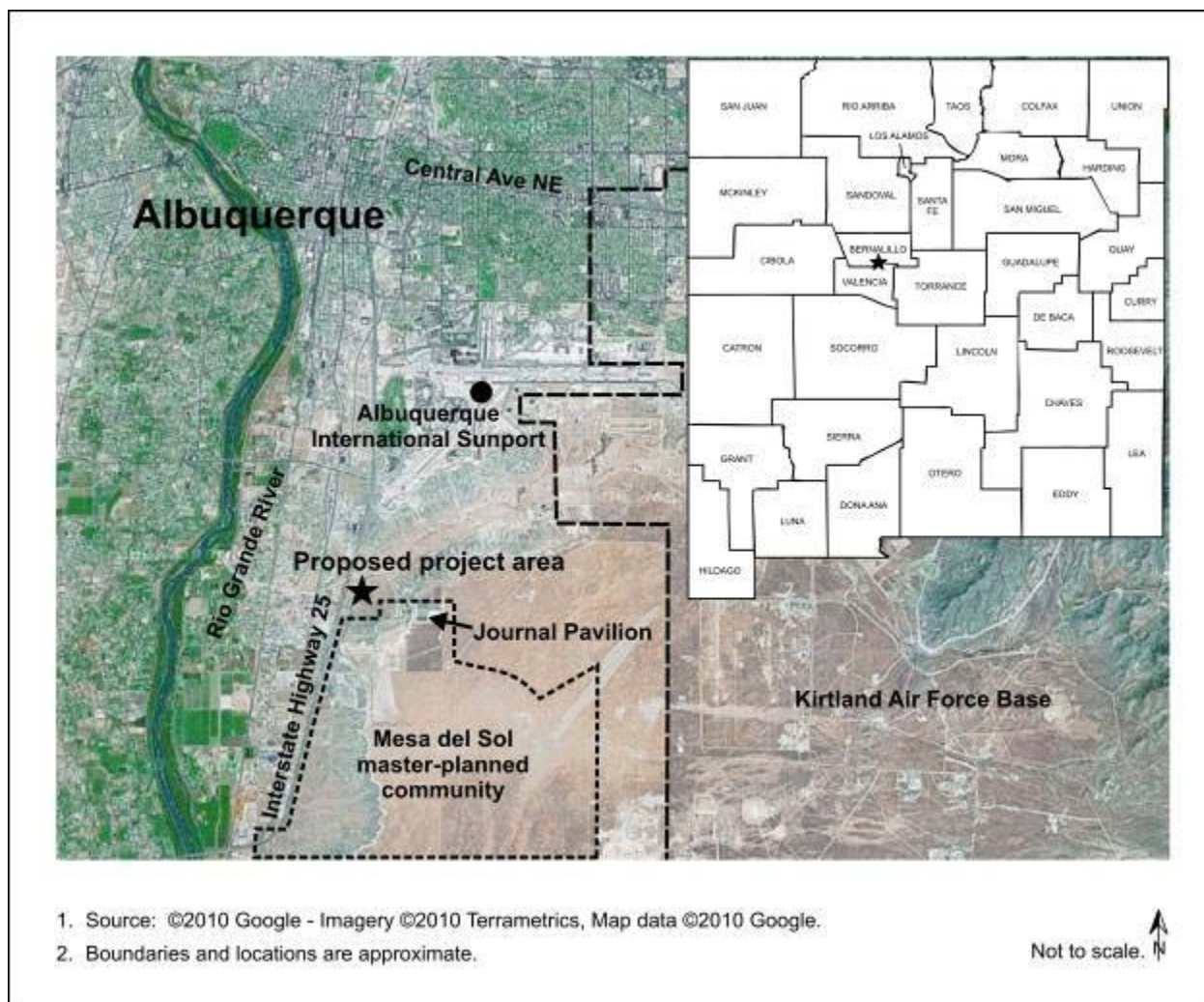
### 2.2 Public Service Company of New Mexico's Proposed Project

PNM is New Mexico's largest electricity provider; the company serves almost 500,000 customers across New Mexico and sells electricity on the wholesale market. PNM would locate the project on a company-owned 27-acre parcel in Bernalillo County, New Mexico. The parcel is about 1.5 miles south of Albuquerque International Sunport on the south side of the city. Figure 2-1 shows the location of the parcel. The elements of the proposed project would cover about 8 acres within the 27-acre parcel. The site is currently undeveloped and is adjacent to similar undeveloped land.

PNM's proposed project is to install a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery for simultaneous voltage smoothing and peak shifting. The proposed project would include the construction of an access road to Los Picaros Road, onsite roads, a small parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system. The tie-in would be partially located within the municipal right-of-way along Picaros Road SE to the PNM property. The battery installation and parking lot would cover about 1 acre; much of the remaining area would host the solar array described later in this section.

The battery installation would be a module-type system that would include energy storage and enable power conditioning, voltage smoothing, and peak shifting. The battery would provide up to 500 kilowatts of power and 2 to 4 megawatt-hours of energy storage capacity. Figure 2-2 shows a battery module and a rendering of battery cell construction. The installation could be up to 8 modules high. The electrolyte gel would be sealed within the battery cells. The battery would meet all compliance requirements to be labeled nonspillable. In addition, the container would include the flame-retardant polypropylene.

PNM would use this testing installation to study the ability of renewably charged energy storage to meet peak energy demand, in effect shifting the output peak. PNM would test the system's ability to mitigate voltage fluctuations from intermittent renewable sources of power such as solar arrays and wind turbines. The system would have the ability to switch between two configurations—the end of distribution feeder (downstream from a substation) versus the beginning of a distribution feeder (adjacent to the substation)—to demonstrate the voltage

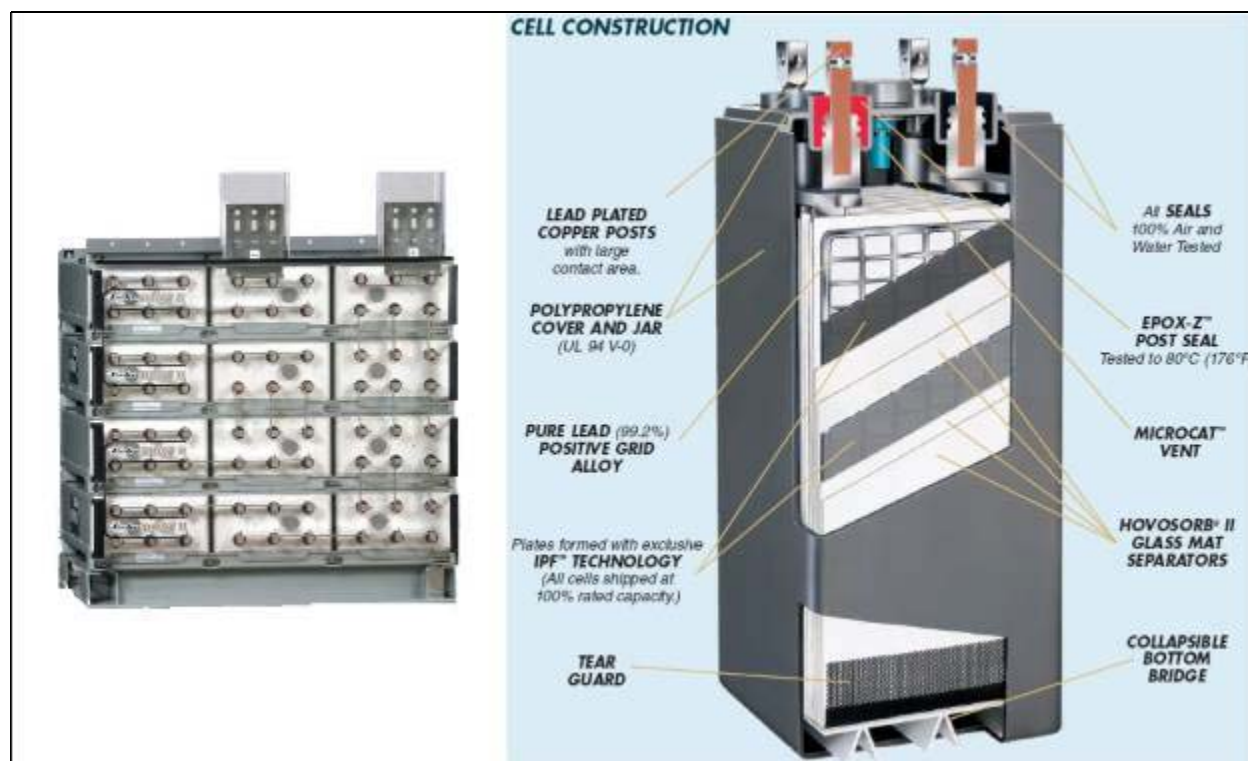


**Figure 2-1.** Location of the proposed project south of Albuquerque, New Mexico.

smoothing and peak shifting capabilities in both scenarios. The control system would incorporate computer-based modeling tools to optimize the control algorithms that would operate the battery system.

Although not part of the proposed project in this EA, PNM would also install, at its own cost, a photovoltaic solar array near the battery on the same PNM-owned parcel. PNM would use the array to supply energy to the battery. The array would have a rated maximum output of 500 kilowatts. The electricity from the array would pass through a set of collectors to the battery or through an inverter to bypass the battery and send the electricity directly to the distribution line. PNM would face the panels south and angle them to maximize the solar energy they could capture. The panels would be between 4 and 8 feet high dependent on the final alignment and slope of the area. PNM would build a chain-link fence around the entire photovoltaic array and might build either a cinderblock wall or a chain-link fence around the battery enclosure.





**Figure 2-2.** Battery module and cell construction.

Figure 2-3 shows the site layout, the elements of the proposed project, and the location of the PNM-funded solar array. It also shows the potential Prosperity Substation, which PNM might construct in the future if there is need. Chapter 4 discusses the Prosperity Substation. Figure 2-4 shows views of and around the proposed site including a storage yard to the west of the site, which is the only other development in the immediate vicinity.

### 2.3 No-Action Alternative

Under the No-Action Alternative, DOE would not provide financial assistance for the proposed project. As a result, the project might be delayed as PNM sought other funding sources to meet its needs or abandoned if other funding sources could not be obtained. As a result, DOE's ability to achieve its objectives under the Smart Grid Demonstrations Program and the Recovery Act would be impaired.

Although this and other selected projects might proceed if DOE decided not to provide financial assistance, the Department assumes for purposes of this EA that the project would not proceed without DOE assistance. If PNM did proceed without DOE's financial assistance, the potential impacts would be essentially identical to those if the Department provided the funding. To allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumes that, if it were to decide to withhold assistance from a project, the project would not proceed.



**Figure 2-3.** Site layout showing proposed facilities.

## 2.4 DOE Alternative Actions

DOE’s alternatives to this proposed project consist of the 31 other technically acceptable applications it received in response to Funding Opportunity Announcement DE-FOA-0000036, “Recovery Act: Smart Grid Demonstrations.” Before selection, DOE made preliminary determinations about the level of review under NEPA based on potentially significant impacts it identified during review of the technically acceptable applications. DOE conducted these preliminary reviews pursuant to 10 CFR 1021.216 and prepared environmental critiques and synopses for projects under the Funding Opportunity Announcement. These preliminary NEPA determinations and environmental reviews were provided them to the selecting official, who considered them during the selection process. Appendix D contains a copy of the environmental synopsis for Area of Interest 2.

Because DOE’s proposed action under the Smart Grid Demonstrations Program is limited to providing financial assistance in cost-sharing arrangements to selected applicants in response to a competitive funding opportunity, DOE’s decision is limited to either accepting or rejecting the project as proposed by the proponent, including its proposed technology and selected sites. DOE’s consideration of reasonable alternatives is therefore limited to the technically acceptable applications and the No-Action Alternative for each selected project.



Looking west at storage yard



Looking east



Looking north



Looking south

**Figure 2-4.** Views of and around the site.

### **3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

Sections 3.1 to 3.6 detail the affected environment and potential environmental consequences for the proposed project and the No-Action Alternative. The sections discuss air quality, water resources, land use, biological resources and soils, historic and cultural resources, and socioeconomics and environmental justice. Section 3.7 discusses resource commitments.

#### **3.1 Air Quality**

Section 3.1.1 discusses regional air quality, and Section 3.1.2 provides estimates of emissions from PNM's proposed project.

##### **3.1.1 Affected Environment**

The ambient air quality in an area can be characterized in terms of whether it complies with the primary and secondary National Ambient Air Quality Standards. The Clean Air Act (42 U.S.C. 7401 et seq.) requires the U.S. Environmental Protection Agency (EPA) to set national standards for pollutants that are considered harmful to public health and the environment. The EPA established standards for six criteria pollutants: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter [both with median aerodynamic diameter of less than or equal to 10 micrometers (PM<sub>10</sub>) and less than or equal to 2.5 micrometers (PM<sub>2.5</sub>)], and sulfur dioxide. Primary standards define levels of air quality for each of the six criteria pollutants that would provide an adequate margin of safety to protect public health including the health of sensitive populations such as children and the elderly. Secondary standards define levels of air quality that are deemed necessary to protect the public welfare including protection against decreased visibility and damage to animals, crops, vegetation, and buildings. EPA designates regions that do not meet the standards as nonattainment areas.

EPA has designated Bernalillo County as an attainment area for all criteria pollutants (EPA 2010). Table 3-1 lists the primary National Ambient Air Quality Standards for each criteria pollutant and 2008 air quality data for Bernalillo County.

##### **3.1.2 Environmental Consequences**

###### **3.1.2.1 Proposed Project**

###### **3.1.2.1.1 Construction Impacts**

Air emissions from construction activities at the proposed site would include fugitive dust from site preparation and combustion emissions from vehicles and heavy-duty equipment for construction of new facilities.

**Table 3-1.** Primary standards and 2008 Bernalillo County air quality data.

Pollutant	Averaging period	Primary standard	Bernalillo County 2008
Carbon monoxide	8 hours	9 ppm	3.7 ppm
	1 hour	35 ppm	2.3 ppm
Lead	Quarterly	1.5 µg/m <sup>3</sup>	NA
Nitrogen dioxide	Annual	0.053 ppm	0.012 ppm
Ozone	8 hours	0.075 ppm	0.070 ppm
PM <sub>10</sub>	24 hours	150 µg/m <sup>3</sup>	132 µg/m <sup>3</sup>
PM <sub>2.5</sub>	Annual	15.0 µg/m <sup>3</sup>	6.02 µg/m <sup>3</sup>
	24 hour	35 µg/m <sup>3</sup>	14.3 µg/m <sup>3</sup>
Sulfur dioxide	Annual	0.03 ppm	NA
	24 hours	0.14 ppm	NA

Source: 40 CFR 50.4 through 50.13, EPA 2010.

µg/m<sup>3</sup> = micrograms per cubic meter; ppm = parts per million.

NA = not available; the EPA did not list lead and sulfur dioxide levels for 2008.

Tijeras Canyon is a divide between the Sandia and Manzano mountain ranges. When large frontal systems pass through central New Mexico, air pressure gradients between the east and west sides of these mountain ranges can generate high winds that blow through Tijeras Canyon. These large frontal systems generate high winds frequently during early spring, and high winds result from more localized events such as storms (Appendix C). The fine sandy soils at the site can be subject to severe soil blowing after vegetation removal. Therefore, construction would have to occur under a Bernalillo County fugitive dust permit. Because the project would disturb less than 20 acres on company-owned land, PNM could construct the facilities under its blanket construction permit (Horn 2009).

Vehicular and fugitive dust emissions would have short-term adverse impacts that PNM would mitigate through best management practices such as soil stabilization and watering of exposed soils. Fugitive dust emissions would cease on completion of construction, so long-term impacts would be negligible.

### 3.1.2.1.2 Operations Impacts

Operation of the battery as well as the solar array would not generate air emissions. Because the proposed project would not cause emissions of criteria pollutants or their precursors, no conformity determination under the Clean Air Act (42 U.S.C. 7401 et seq.) would be necessary (DOE 2000).

### Greenhouse Gas Emissions

The burning of fossil fuels, such as diesel and gasoline, emits carbon dioxide, which is a greenhouse gas. Greenhouse gases can trap heat in the atmosphere and have been associated with global climate change. The Intergovernmental Panel on Climate Change 2007 Fourth Assessment Report stated that warming of the earth’s climate system is unequivocal, and that most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in concentrations of greenhouse gases from human

activities (IPCC 2007). Greenhouse gases are well mixed throughout the lower atmosphere, such that any emissions would add to cumulative regional and global concentrations of carbon dioxide.

The collocated solar array would result in the generation of about 500 kilowatts of electricity with no increase in greenhouse gas emissions. Operating this renewable energy project would not generate carbon dioxide and could result in a decrease in carbon dioxide emissions from regional power plants. Therefore, the proposed project would have no cumulative carbon impact.

### **3.1.2.2 No-Action Alternative**

Under the No-Action Alternative, DOE would not provide funding to PNM for the proposed project, and DOE assumed for this EA that the project would not proceed without that assistance. Fugitive emissions from site preparation and construction activities would not occur. However, there would also be no potential for a beneficial decrease in regional emissions of pollutants from the use of the solar array.

## **3.2 Water Resources**

Section 3.2.1 describes current conditions for surface water, groundwater, and floodplains and wetlands. Section 3.2.2 discusses the potential impacts of the proposed project to water resources.

### **3.2.1 Affected Environment**

#### **3.2.1.1 Surface Water**

The proposed project site is about 0.15 mile south of the Tijeras Arroyo, which is a tributary to the Rio Grande River. An unnamed arroyo flows through the 27-acre parcel and intersects with Los Picaros Road, but not the 8-acre proposed site. There are no other surface water features on the parcel. The arroyos are dry most of the year, but storm water runoff flows through them, most heavily in the summer (Funk 2008).

#### **3.2.1.2 Groundwater**

The Santa Fe Group Aquifer is the primary drinking water supply for the region. In 2009, 85 wells pumped 23.4 billion gallons of water from the Santa Fe Group Aquifer (ABCWUA 2010). Groundwater in the vicinity reportedly flows generally southward at depths greater than 150 feet below the surface.

#### **3.2.1.3 Floodplains and Wetlands**

The proposed project site is not in a designated 100-year floodplain, and there are no wetlands on the proposed site.

## **3.2.2 Environmental Consequences**

### **3.2.2.1 Proposed Project**

#### **3.2.2.1.1 Construction Impacts**

Site preparation and construction could result in storm water runoff and soil erosion. Runoff during construction would be regulated and controlled under a National Pollutant Discharge Elimination System storm water construction permit and a storm water pollution prevention plan. The plans would provide guidelines for preventing or mitigating potential runoff to the Tijeras Arroyo. PNM would implement a soil erosion management plan that would also help to control runoff. The company would spray disturbed soils with water to suppress dust as necessary; the water would come by truck from municipal water sources. PNM would likely need to cross the unnamed arroyo during construction and would obtain the necessary permits from the U.S. Army Corps of Engineers (Horn 2009). PNM has an existing spill prevention and mitigation plan it would follow at the proposed site.

#### **3.2.2.1.2 Operations Impacts**

##### **Surface Water**

The proposed project would not require potable or process water for operations. PNM would not use surface water, would not discharge wastewater, and would not need permits for operations.

##### **Groundwater**

The proposed project would not use groundwater for operations, and there would be no underground storage tanks. PNM would prevent or mitigate the small potential for impacts from spills of oil and gas from maintenance equipment and vehicles on the site under its existing spill prevention and mitigation plan. The advanced lead acid battery would include hazardous and toxic substances in the form of electrolyte gel, but they would be within the battery system. The battery system is designed to contain 100 percent of the gel from a failure of a primary cell. Therefore, DOE does not expect impacts to groundwater from operations.

##### **Floodplains and Wetlands**

The proposed construction activities would not occur in a 100-year floodplain, and there are no wetlands on or near the site. Therefore, there would be no impacts to floodplains or wetlands during operations.

### **3.2.2.2 No-Action Alternative**

Under the No-Action Alternative, there would be no water use and no activity to affect water resources from potential erosion, runoff, or spills. Therefore, there would be no impacts to surface water, groundwater, floodplains, or wetlands.

### 3.3 Land Use

Section 3.3.1 describes current land use and ownership in the area. Section 3.3.2 discusses the potential impacts of the proposed project.

#### 3.3.1 Affected Environment

The proposed project site is on the south side of Albuquerque, New Mexico, in Bernalillo County. The site is on a north-facing gentle slope just south of and above the main channel of Tijeras Arroyo. The site is on the south side of Tijeras Canyon about one-quarter mile east of Interstate Highway 25 within the southwest quarter of Section 16 in Township 9N, Range 3E. The 8-acre site is within a 27-acre parcel of undeveloped land that PNM owns. The parcel has no structures or other improvements, but there are unpaved off-road vehicle trails. The proposed project elements are an advanced lead acid battery, an access road, a parking lot, and a tie-in to the existing power distribution system would occupy about 8 acres of the 27-acre parcel. PNM would separately install the solar array in the 8-acre project area south of the battery. The property is zoned for mixed use (Horn 2009).

Land uses near the proposed project site include a construction materials storage site next to the proposed site on the west side. Just south of the proposed site is an open-air music venue, the Journal Pavilion. There are a few small commercial businesses to the west along Los Picaros Road. There is a three-phase power line about 1,600 feet from the site to the west along Los Picaros Road. There is also a 2-inch gas line and telephone lines to the north of the proposed site. The proposed project site is near the Mesa del Sol master-planned community development on a nearby mesa. Chapter 4 discusses this development as part of the cumulative impacts analysis.

Figure 2-3 in Chapter 2 shows the proposed facility elements and site layout, and Figure 2-4 shows views in and around the proposed project area.

#### 3.3.2 Environmental Consequences

##### 3.3.2.1 Proposed Project

###### 3.3.2.1.1 Construction Impacts

Site preparation and construction of proposed project elements, the advanced absorbed valve-regulated battery, a parking area, and the PNM-funded solar array would occur on an 8-acre area within the larger 27-acre project parcel. This activity would alter the current undeveloped state of the land to one with equipment for the demonstration of this smart grid technology. In addition, changes to the land would include an access road, internal site roads, and a 3,000-foot underground electrical tie-in from the battery to the existing power distribution system.

PNM would regenerate any other areas it disturbed during site preparation and construction (those not hosting project facilities) using species indigenous to the region.



### 3.3.2.1.2 Operations Impacts

Other than the existence of the features the previous section describes, operations would not entail further land use impacts. The nearby Mesa del Sol mixed-use community is a green community that includes solar companies and other compatible land uses. The proposed project would not influence or cause changes to land uses near the proposed project site.

### 3.3.2.2 No-Action Alternative

Under the No-Action Alternative, PNM would not implement the proposed project. Therefore, the conversion of land from undeveloped to energy demonstration uses would not occur.

## 3.4 Biological Resources and Soils

Section 3.4.1 describes biological resources and soils in and near the proposed project site. Section 3.4.2 discusses the potential impacts. DOE has sent a consultation letter to USFWS with a copy of the survey to comply with Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), and received a reply. The USFWS concurred with the determination (Section 3.4.2) that the Proposed Action might affect but is not likely to adversely affect the black-footed ferret, the silvery minnow, or its designated critical habitat.

### 3.4.1 Affected Environment

PNM commissioned a biological survey that was completed in April 2010; Appendix C is a copy of the report. The following is a summary of site conditions on the 27-acre parcel from that report except where noted.

Vegetation. The dominant vegetation within the project area is Desert Grassland with a shrub component. Vegetation in the northeast corner of the parcel is somewhat stunted with scattered sand sage and almost no grass cover. The southern portion of the parcel is well vegetated. The survey found 48 species of vascular plants in 18 plant families the parcel. There are no rare or unusual plants or unique plant habitats. Attachment A to Appendix C lists the species.

Wildlife. The survey recorded 20 species of wildlife including 10 species of birds, 6 species of mammals, and 4 species of reptiles. There are no aquatic habitats or amphibians in the project area. There were coyote tracks at the time of the survey but no other evidence of large mammals in the project area. There was no evidence of wildlife trails or seasonal wildlife movement through the area. Attachment B to Appendix C contains a list of the wildlife species the survey found.

Migratory Birds. The survey occurred during the breeding season for many birds, but it found neither bird's nests in the shrubs nor any indication of ground-nesting birds.

Threatened and Endangered Species. More than 30 special-status species occur in Bernalillo County. Seven of these could occur within the proposed project area (Appendix C, Table 1).

Two species on the federal endangered species list, the black-footed ferret (*Mustela nigripes*) and the Rio Grande silvery minnow (*Hybognathus amarus*), could occur on the site or, in the case of the minnow, could be affected by project activities.

Geology and Soils. The proposed project area is in the Mexican Highlands Section of the Basin and Range Province. The National Resource Conservation Service identifies the soils in the area as bluepoint loamy fine sands, which have some susceptibility to erosion. PNM would use about 8 acres of the 27-acre company-owned parcel to install the proposed project elements and the PNM-funded solar array.

### **3.4.2 Environmental Consequences**

#### **3.4.2.1 Proposed Project**

##### **3.4.2.1.1 Construction Impacts**

During construction, wildlife could avoid the project area due to construction noise and increased human activity. Some wildlife deaths could occur because of the presence of vehicles and construction equipment.

Site preparation and installation of the battery, the parking lot, and separately installed solar array would occupy only 8 acres within the larger 27-acre parcel. Habitat disruption would be minimal.

The biological survey (Appendix C) found no suitable habitat for either of the endangered species. The black-footed ferret requires a large population of prey, and there was no evidence of suitable prey in or near the project area. The Rio Grande silvery minnow is not likely to occur on the site, but the site is upslope of Tijeras Arroyo, which discharges into designated habitat for the minnow in the Rio Grande River. Because of the system design, all hazardous and toxic materials would be self-contained within the battery enclosure. Further, PNM would slope the site so that runoff would flow away from Tijeras Arroyo if necessary.

Construction activities would affect only a small area (8 acres) and be short term, so the potential for erosion would be low. PNM would manage the project under a soil erosion and mitigation plan. PNM would minimize destruction of existing ground cover and would return any other areas it disturbed during site preparation and construction (and not hosting project equipment) to conditions that are more natural.

Based on the above information, DOE determined that there would be no effects to federally threatened, endangered, or candidate species.

In relation to migratory birds, if any construction activities occurred during the nesting season, PNM would survey the site to ensure there were no active migratory nests present. If that survey found nests, PNM would take steps to avoid impacts or develop mitigation actions.

#### **3.4.2.1.2 Operations Impacts**

Impacts to biological resources from facility operations would be unlikely, with the possible exception of occasional vehicle-related wildlife incidents and limited noise during site visits. There would be no routine operational emissions or discharges, and PNM would have plans in place to manage accidental releases. There would be no operations-related soil disturbances, so there would be no impacts to soils.

#### **3.4.2.2 No-Action Alternative**

Under the No-Action Alternative, PNM would not implement the proposed project. There would be no site preparation or operations, so there would be no impacts to biological resources or soils.

### **3.5 Historic and Cultural Resources**

DOE must comply with Section 106 of the National Historic Preservation Act (16 U.S.C. 470 et seq.). As such, the Department often consults with SHPOs and interested Native American tribes. In the case of this proposed action and PNM's proposed project, DOE consulted with the New Mexico SHPO. Based on information the SHPO provided, DOE also consulted with eight Native American pueblos and tribes that have expressed interest in potential projects in Bernalillo County. DOE sent letters to pueblo governors and tribal officials to request information on areas near the proposed project site that might have traditional, religious, or cultural significance.

Section 3.5.1 describes historic and cultural resources in and near the proposed project site, and Section 3.5.2 discusses the potential impacts. Appendix B contains copies of the correspondence between DOE, the New Mexico SHPO, and the interested Native American groups. At the time of publication, the Pueblo of Laguna had responded and concurred (Appendix B) with DOE's determination of no impacts to cultural properties in Section 3.5.2.

#### **3.5.1 Affected Environment**

The proposed project area is undeveloped; there are no existing buildings or structures on the proposed project site or within the proposed route of the underground tie-in to the existing power distribution system, which together make up the area of potential effect. There is one previously recorded archaeological site of potential significance less than 0.5 mile from the project site. The archaeological site contains lithic scatter of unknown cultural or temporal origin. It is potentially eligible for listing under Criterion D of the National Historic Preservation Act. Four isolated occurrences have also been identified in the area of potential effect. PNM commissioned an additional cultural resources survey in June 2010 that confirmed that the previously recorded site is eligible for listing in the *National Register of Historic Places* (NRHP).

## **3.5.2 Environmental Consequences**

### **3.5.2.1 Proposed Project**

#### **3.5.2.1.1 Construction Impacts**

The proposed project would include site preparation and installation of equipment on an 8-acre site within PNM's 27-acre parcel. PNM would also construct the solar array on this 8-acre site. PNM would construct an access road from Los Picaros Road to the site and a 3,000-foot underground electrical tie-in to its existing power distribution system. The route of the electrical tie-in would closely follow Los Picaros Road.

PNM has designed the project to avoid disturbances of and effects on properties that are listed on, nominated to, or eligible for the NHRP. The June cultural resources survey concluded that, with avoidance, "... the proposed battery, parking lot, electrical feeder lines, and onsite road installation will have no effect and will not alter the characteristics of the site that qualifies it for inclusion to the NRHP and/or State Register of Cultural Properties" (Cienega Environmental 2010).

The company would monitor activities throughout construction to ensure avoidance of the known sites. Further, if PNM found buried cultural deposits during project activities, it would stop work immediately and notify the New Mexico SHPO and its own Environmental Services Department.

#### **3.5.2.1.2 Operations Impacts**

Impacts to historic or cultural resources during operation would be unlikely. PNM would conduct site avoidance monitoring during maintenance activities. If PNM encountered buried cultural deposits during project activities, it would stop work immediately and notify the New Mexico SHPO and its own Environmental Services Department.

### **3.5.2.2 No-Action Alternative**

Under the No-Action Alternative PNM would not proceed with the project, so there would be no activities that might cause impacts to either previously recorded or unknown resources that are either listed on, nominated to, or eligible for listing on the registry.

## **3.6 Socioeconomics and Environmental Justice**

Section 3.6.1 describes the socioeconomic environment in Bernalillo County, and Section 3.6.2 discusses the potential impacts. Section 3.6.3 addresses environmental justice concerns.

### **3.6.1 Affected Environment**

The proposed project site is in Bernalillo County, New Mexico, near Albuquerque and part of the Bureau of the Census Albuquerque New Mexico Metropolitan Statistical Area (Metro Code 10740). Bernalillo County's estimated population of about 685,000 persons in 2008 reflects a 14.2-percent growth since 2000 (Bureau of the Census 2010a). The metropolitan statistical area had a 2008 estimated population of about 847,000 (Bureau of the Census 2010b). In 2008, the Bernalillo County population was 86.1-percent white, 4.1-percent black, 2.3-percent Asian, and 5.1-percent American Indian or Alaskan Native. About 2.2 percent of the population reported themselves as being of two or more races. Persons of Hispanic or Latino origin made up 45.8 percent of the population (Bureau of the Census 2010a).

The county's employment figures reflect the urban nature of the community; the county hosted about 441,000 nonfarming jobs in 2008, of which about 47,000 jobs (11 percent) were in retail trade and about 46,000 (10 percent) were in health care and social assistance (BEA 2009). Bernalillo County residents held about 85 percent of the total jobs. People who lived in Sandoval County to the north held about 7 percent, residents of Valencia County to the south held about 5 percent, and people who lived outside those counties held the remainder (Bureau of the Census 2003). The county's February 2010 labor force had an unseasonally adjusted unemployment rate of 8.7 percent, which was slightly less than the state's rate of 8.9 percent that month (BLS 2010).

The 2007 per capita income in Bernalillo County of about \$35,000 was about 114 percent of the State of New Mexico per capita income (BEA 2010). In 2008, about 14 percent of county residents and 17 percent of New Mexico residents were living in poverty (Bureau of the Census 2010a). Section 3.6.3 discusses racial and ethnic populations and the low-income population in more details in relation to environmental justice.

### **3.6.2 Environmental Consequences**

#### **3.6.2.1 Proposed Project**

The proposed project would be unlikely to create direct jobs except during the 4-month construction phase. Direct socioeconomic changes because of the proposed project would not be likely, and there would be no changes to population, infrastructure, or the level of social services. In addition, vendors and equipment suppliers would benefit from capital orders for the battery, solar array, and supporting components and systems.

##### **3.6.2.1.1 Construction Impacts**

Construction and installation would take about 4 months (Campbell 2010). PNM estimates the cost of procurement, installation, and startup would be about \$5.9 million. Of this amount, PNM would pay 70 percent and the Recovery Act funding would cover the 30-percent balance of about \$1.8 million. DOE used standard multipliers to estimate the indirect economic effects of

the proposed project. The estimated total earnings effect in the region due to the \$5.9-million expenditure would be between about \$12.7 million. The final output would be about \$9.6 million. Much of the construction-related spending would directly benefit the suppliers of the battery components for the substation and the vendors who would provide materials and services for manufacture of the equipment.

#### **3.6.2.1.2 Operations Impacts**

The operation and maintenance of the battery system, the tie-in, and the solar array would not have noticeable direct or indirect socioeconomic impacts.

#### **3.6.2.2 No-Action Alternative**

Under the No-Action Alternative PNM would not proceed with the project and would not buy the battery, solar array, and associated equipment. Therefore, the potential positive benefits of the proposed project, including the indirect total earnings effect and the final output effect, would not occur.

#### **3.6.3 Environmental Justice**

Executive Order 12898, “Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations,” directs federal agencies to address environmental and human health conditions in minority and low-income communities. The evaluation of impacts to environmental justice is dependent on determining if high and adverse impacts from the proposed project would disproportionately affect low-income or minority populations in the affected community.

DOE has determined that direct socioeconomic impacts from the proposed project are unlikely (Section 3.6.2). The proposed project would not result in workers moving to the area, so there would be no impact to infrastructure including housing and the level of social services in the area. There would be small, positive economic impacts from indirect employment opportunities in the region.

Table 3-2 lists racial and ethnic data about persons in Bernalillo County and, for comparison, the state of New Mexico. Bernalillo County has a large ethnic minority population; persons of Hispanic or Latino origin made up about 46 percent of county residents in 2008. This is similar to the statewide average of about 45 percent. The aggregate percent of all racial minorities (Black, American Indian or Alaskan Native, Asian, or of two or more races) was 14 percent in Bernalillo County and 16 percent in New Mexico. Hispanics may be of any race, so are included in applicable race categories. Neither racial nor ethnic minority persons would experience adverse socioeconomic impacts from the proposed projects. There would be no direct socioeconomic impacts to any population, and the indirect impacts would be small and positive. The indirect economic impacts from the project would include indirect employment

opportunities in the region and enhanced final output because of the infusion of project-related spending.

**Table 3-2.** 2008 racial and ethnic characteristics, Bernalillo County and New Mexico.

Racial and ethnic characteristics	Bernalillo County (percent)	New Mexico (percent)
White	86.1	84.0
Black	4.1	3.0
American Indian and Alaska Native	5.1	9.7
Asian persons	2.3	1.4
Persons reporting two or more races	2.2	1.8
Persons of Hispanic or Latino Origin	45.8	44.9
White but not Hispanic	43.5	41.7

Source: Bureau of the Census 2010a.

DOE has also determined that there would be no high and adverse impact to low-income populations. In 2008, about 14 percent of the residents in Bernalillo County lived below the poverty level, and the statewide rate was about 17 percent. There would be no direct socioeconomic impacts to any population, and the indirect impacts would be small and positive. The indirect economic impacts from the project would include indirect employment opportunities in the region and enhanced final output because of the infusion of project-related spending.

In summary, DOE determined that no high and adverse impacts would occur to any member of the community. Therefore, there would be no adverse and disproportionate impacts to minority or low-income populations.

### 3.7 Resource Commitments

#### 3.7.1 Relationship Between Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

PNM’s proposed project to install and operate a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid storage battery for simultaneous voltage smoothing and peak shifting in Bernalillo County, New Mexico, would result in a short-term use of land. In this context, *short-term use* of resources means the operating life of the facility, and *long-term productivity* refers to the period after the facility has ceased operation and undergone decommissioning and demolition. At that time, the land could be occupied and used for other purposes, or it could be reclaimed and regenerated with plant species native to the area.

#### 3.7.2 Irreversible and Irretrievable Commitments of Resources

The use of land as a resource to support the construction and operation of the proposed project would be irretrievable in the short-term. Some unrecyclable construction materials, energy, and

the fuel for facility construction and maintenance would be irreversible and irretrievable commitments of resources. DOE would also have expended funding on the proposed project.

### **3.7.3 Unavoidable Adverse Impacts**

The proposed project would result in the unavoidable small adverse impacts of construction noise, fugitive dust, vehicle emissions, and possible loss of wildlife due to onsite traffic and construction equipment. These small unavoidable impacts would be offset by the positive impacts of voltage regulation and load shifting from the use of solar power. This could result in reduced emissions from conventional fossil-fuel power plants.



## 4. CUMULATIVE IMPACTS

Cumulative impacts result from the incremental effects the proposed project could have in combination with the impacts of past, present, and reasonably foreseeable actions. The proposed project would install a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery, a parking lot, an access road, and a 3,000-foot underground electrical tie-in to the existing power distribution system. PNM would also install separately, at its own cost, a collocated utility-scale photovoltaic solar array with an output of about 500 kilowatts. PNM would use about 8 acres of a company-owned 27-acre parcel for the proposed project and solar array.

As Figure 2-1 shows, the proposed project site is near the urbanized area of Albuquerque, New Mexico. The environmental impacts of past actions in the Albuquerque area have already passed through the environment or been captured as part of the current baseline conditions. DOE considered nearby present actions (Section 4.1) and reasonably foreseeable actions (Section 4.2) in combination with the potential impacts of the project (Table 1-1 and Chapter 3) to assess potential cumulative impacts.

### 4.1 Present Actions

PNM has ongoing actions to reduce use of carbon-based fuels and greenhouse gas emissions, to increase the use of renewable energy sources such as solar and wind energy and biogas power, and to increase energy efficiency. These initiatives would have net beneficial cumulative impacts. The proposed project would be part of and consistent with those initiatives and would therefore contribute in a small way to those positive benefits.

The contribution of PNM's proposed project to potential cumulative effects in relation to the Mesa del Sol master-planned community and the Journal Pavilion would be small, temporary, or both. The nominal short-term increase in traffic during the construction and operations of the proposed project would not affect daily flow to Mesa del Sol. Project traffic also would not likely coincide with traffic to and from events at the Journal Pavilion because of the times and days that performances typically occur. Noise likely would not travel as far as Mesa del Sol and would nevertheless be temporary and short-term. The facility elements at the proposed site could be seen from Interstate Highway 25 and along Los Picaros Road, and possibly from the most northeastern parts of Mesa de Sol depending on future development. The monetary investment in the proposed project would result in indirect beneficial impacts to the region. Given the size of the regional economy and the project, the impacts would be small. There would be no contributions to operational air or water impacts and no adverse effects on threatened or endangered species. PNM would avoid cultural resources of importance, so there would no cumulative impacts or disruption of cultural resources. The proposed project would increase the amount of developed land in the area by 8 acres.

PNM Operations. PNM provides electricity to about 500,000 customers in the urban and semiurban areas in the northern half of New Mexico and PNM maintains about 2,300 miles of transmission lines and about 7,600 miles of electric distribution lines. PNM is a significant owner of the San Juan coal-fired plant near Farmington, New Mexico, and a 10-percent owner of the Palo Verde Nuclear Generating Station near Phoenix, Arizona. PNM also owns and operates several natural gas power plants throughout the state including the Reeves Generating Station in Albuquerque.

As a user of traditional carbon-based fuels to generate electricity, PNM has ongoing actions to reduce greenhouse gas emissions (PNM 2010):

- PNM purchases all of the power from the 200-megawatt New Mexico Wind Energy Center in eastern New Mexico.
- PNM sponsors two existing programs that allow customers who install their own solar systems to send excess power to the grid, for which the company pays through renewable energy credits. The first is the PNM Large Photovoltaic Program for solar systems from 10 kilowatts to 1 megawatt. The second is the PNM Small Photovoltaic Program for systems that generate 10 kilowatts or less. PNM sponsors a number of energy efficiency programs that have reduced carbon emissions by an estimated 80 million pounds per year.
- PNM is using experimental technology to monitor and prevent leaks of sulfur hexafluoride at an Albuquerque substation. Sulfur hexafluoride is used as an insulating gas in high-voltage utility equipment. This gas is one of the most potent greenhouse gases with an atmospheric warming potential much greater than carbon dioxide.

Mesa del Sol Master-Planned Community. Mesa del Sol is a city-scale master-planned community development project south of Albuquerque near Interstate 25 and about 1 mile from PNM's proposed project site. Development of the full concept has been delayed in part by the current economic climate. The developers began installing underground utilities in 2009 including water and sewer lines and built a 175-foot water tower. At present, there are several businesses, solar panel manufacturers, movie studios, healthcare, and other commercial enterprises that have located in the community. Because of the development delays, much of the remaining development is uncertain, but remains reasonably foreseeable. Section 4.2 discusses future development in the community.

Journal Pavilion. The Journal Pavilion is a 15,000-seat open-air amphitheater within the Mesa del Sol boundaries that mainly features concerts. The Pavilion is just south of PNM's proposed project site across Los Picaros Road.

## 4.2 Reasonably Foreseeable Actions

PNM's reasonably foreseeable actions would continue the company's initiatives to reduce use of carbon-based fuels and greenhouse gas emissions by increasing the use of renewable energy sources such as solar and wind energy and biogas power and to increase energy efficiency.

The Mesa del Sol master-planned community is an extremely long-term project with a projected completion period of 40 years. The PNM proposed project in this EA, along with its longer-term energy initiatives, would be consistent with the development's philosophy of being an environmentally friendly community. The substation and 115-kilowatt transmission line would, in combination with the proposed project and other renewable energy initiatives, contribute to the community's goals.

Other potential cumulative impacts would include the short-term or temporary impacts (or both) from construction and the 8-acre increase in conversion of undeveloped land to other use.

PNM Renewable Energy Initiatives. PNM has submitted a proposed plan to the New Mexico Public Regulations Commission that, if approved, would generate about 80 megawatts of new solar electricity in PNM's service territory—up from about 2 megawatts now and enough to power about 26,000 homes (NMBW 2010a). The proposal addresses the state's renewable portfolio standard, which requires utilities to derive 10 percent of their power from renewable sources by 2011 and 20 percent by 2020. Utilities must diversify their renewable procurements with a least 20 percent coming from solar generation.

PNM has also proposed a 2-megawatt solar array on land it owns just south of the Reeves Generating Station in Albuquerque. The plant would include 30,000 ground-mounted solar panels on about 16 acres near Paseo del Norte (NMBW 2010b).

Further, PNM has pending proposals to use biogas from dairy waste from farms in southern New Mexico to help power the gas-fired Luna Energy Facility near Deming.

PNM Prosperity Substation and 115-Kilovolt Power Lines. PNM has tentative plans to construct a substation on the same 27-acre parcel of that would host the proposed project in this EA. PNM would construct the substation to meet increased demand for services in the Mesa del Sol community as it grew. The substation would require construction of a 115-kilovolt transmission line. PNM has conducted preliminary corridor screening for the line. The expansion of services to Mesa del Sol could also include other support systems and structures.

Mesa del Sol Master-Planned Community. Mesa del Sol, as planned, would occupy 25 square miles of land and be a walkable community with local mass transportation, which could reduce automobile use. The developers propose a new interchange with Interstate Highway 25 to serve the community. The plan calls for 100,000 residents to occupy 37,000 green-built housing units over 40 years in four separate villages. Each of the villages would be near a streetcar line that would connect all four villages.

The community has plans for 17 schools to serve an estimated 25,000 students. There are some initiatives to create a school district independent from Albuquerque public schools. The community plans a central business district that would create 23,000 new jobs. As Section 4.1 notes, a portion of the commercial district is complete and businesses have moved into it.

Other elements of the master plan include a recreational complex, open space, and buffer zones along Kirtland Air Force Base.

## 5. CONCLUSIONS

PNM proposes to install a 2- to 4-megawatt-hour advanced lead acid battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system. PNM would also install separately, at its own expense, a collocated utility-scale solar photovoltaic array with an output of about 500 kilowatts. The company would use the battery, along with a sophisticated control system, to turn solar energy into a reliable, dispatchable distributed-generation resource. The proposed project would affect about 8 acres within a 27-acre PNM-owned parcel.

In this EA, DOE considered (1) the proposed action of providing a financial assistance grant under the Recovery Act in a cost-sharing arrangement with PNM, (2) PNM's proposed project, and (3) the No-Action Alternative.

DOE evaluated the environmental resource categories it commonly addresses in EAs and identified no significant adverse impacts from the proposed project. For the resource categories—waste; utilities, energy, and materials; noise; occupational health and safety; aesthetics and visual resources; and transportation—DOE determined there would be no impacts or the potential impacts would be small, temporary, or both and therefore did not carry those forward for additional analysis. DOE focused its analyses on those resources that could require new or amended permits, have the potential for significant impacts or controversy, or typically interest the public, such as socioeconomics and historic and cultural resources. DOE performed a more detailed analyses of potential impacts on six resource categories.

Air Quality. During construction, air emissions would include combustion emissions from vehicles and heavy-duty equipment and fugitive dust from site preparation activities. These emissions would have short-term adverse impacts that PNM would mitigate through best management practices. Operation of the battery as well as the solar array would not generate air emissions.

The collocated solar array would generate about 500 kilowatts of electricity with no increase in greenhouse gas emissions. Operating this renewable energy project would not generate carbon dioxide and could result in a decrease in carbon dioxide emissions from regional power plants. Therefore, the proposed project would have no cumulative carbon impact.

Water Resources. Site preparation and construction could result in storm water runoff and soil erosion. PNM would design the slope of the site, if necessary, to direct runoff away from Tijeras Arroyo and implement a soil erosion management plan. The company would truck in water to spray disturbed soils to suppress dust. PNM would likely need to cross an unnamed arroyo in the area during construction and would obtain the necessary permits from the U.S. Army Corps of Engineers. The proposed project would not require potable or process water for operations. PNM would not use surface water, would not discharge wastewater, and would not need permits for operations.

The proposed project would not use groundwater for operations, and there would be no underground storage tanks for the proposed project. PNM would prevent or mitigate the small potential for impacts from spills of oil and gas under its existing spill prevention and mitigation plan. The advanced absorbed valve-regulated lead acid battery would include hazardous and toxic substances in the form of an electrolyte gel; however, the battery system is designed to contain 100 percent of the gel in an accidental release. Therefore, DOE does not expect impacts to groundwater or the Tijeras Arroyo from operations.

The proposed site is not in a designated 100-year floodplain, and there are no wetlands on the proposed site.

Land Use. Site preparation and construction would occur on an 8-acre area within a larger PNM-owned 27-acre parcel. The site would change from undeveloped to hosting the battery and other features of the proposed project. Changes to the land would include an access road, internal site roads, and a 3,000-foot underground electrical tie-in from the battery to the existing power distribution system. PNM would regenerate any disturbed areas not covered by equipment with species indigenous to the region. Other than the existence of the above-described features, operations would not entail further land use impacts. The nearby Mesa del Sol mixed-use community is a green community that includes solar companies and other compatible land uses. DOE does not expect changes to land use near the proposed project site.

Biological Resources and Soils. During construction, wildlife could avoid the project area due to noise and human activity. Some wildlife deaths could occur because of the vehicles and construction equipment. Habitat disruption would be limited to the 8-acre project site. A biological survey found no suitable habitat for threatened or endangered species. Discharges into designated habitat for the threatened Rio Grande silvery minnow would be unlikely due to the battery technology and onsite management practices. Because of the system design, all hazardous and toxic materials would be self-contained within the battery and very unlikely to have impacts on biological resources. Based on this information, DOE determined that there would be no effects to federally listed threatened, endangered, or candidate species.

In relation to migratory birds, if any construction activities occurred during the nesting season, PNM would survey the site to ensure there were no active migratory bird's nests present. If that survey found nests, PNM would take steps to avoid impacts or develop mitigation plans if necessary.

Impacts to biological resources from operations would be unlikely, with the possible exception of occasional vehicle-related wildlife incidents and limited noise during site visits. Routine operational emissions or discharges would not occur, and PNM would have plans in place to manage accidental releases. There would be no operations-related soil disturbances, so there would be no impacts to soils.

Historic and Cultural Resources. There are no known historic or cultural resources in the areas PNM would disturb. The company has designed the project to avoid disturbances of and impacts

on properties that are listed on, nominated to, or eligible for the NHRP. The company would monitor activities throughout construction and operations to ensure avoidance of the known sites. If PNM found cultural deposits during project activities, it would stop work immediately and notify the New Mexico SHPO and its own Environmental Services Department. DOE consulted the New Mexico SHPO and interested Native American tribes. Impacts to historic or cultural resources during operation would be unlikely.

Socioeconomics and Environmental Justice. The proposed project would be unlikely to create direct jobs except during the short 4-month construction period, so there would be no changes to population, infrastructure, or the level of social services in the area. There would be indirect economic consequences because vendors and equipment suppliers would benefit from the capital orders for the battery, solar array, and support systems. The positive economic benefits would be small.

The evaluation of impacts to environmental justice is dependent on determining if high and adverse impacts from the proposed project would disproportionately affect low-income or minority populations. DOE determined that no high and adverse impacts would occur to any member of the community, including socioeconomic impacts, so there would be no high and adverse impacts to any minority or low-income population.

Cumulative Impacts. PNM has present (ongoing) actions to reduce use of carbon-based fuels and greenhouse gas emissions, to increase the use of renewable energy sources such as solar and wind energy and biogas power, and to increase energy efficiency. The PNM initiatives would have net beneficial cumulative impacts. The proposed project would be part of and consistent with those initiatives and would therefore contribute in a small way to those positive benefits.

The contribution of PNM's proposed project to potential cumulative effects in relation to the Mesa del Sol master-planned community and the Journal Pavilion open-air concert venue would be small, temporary, or both. The monetary investment in the proposed project would result in indirect beneficial impacts to the region. Given the size of the regional economy, the impacts would be small. There would be no contributions to operational air or water impacts, or adverse effects on threatened or endangered species. PNM would avoid cultural resources of importance, so there would be no cumulative impacts to or disruption of cultural resources. The proposed project would increase the amount land converted from undeveloped to other uses by 8 acres.

PNM's reasonably foreseeable actions would continue the company's initiatives to reduce use of carbon-based fuels and emissions of greenhouse gases, to increase the use of renewable energy sources such as solar and wind energy and biogas power, and to increase energy efficiency.

The proposed project would be consistent with the goals of the Mesa del Sol master-planned community in terms of being an environmentally friendly community that uses renewable energy sources and other green technologies.

No-Action Alternative. DOE assumed for the EA analyses that PNM would not proceed with the project without DOE assistance. Therefore, there would be no impacts to any resource category from the No-Action Alternative. The small, positive socioeconomics impacts, the potential to reduce new conventional power plant construction, and the potential reduction in greenhouse gases would also not occur under the No-Action Alternative. In addition, DOE's ability to achieve its objectives under the Smart Grid Demonstrations Program and the Recovery Act would be impaired.



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## **APPENDIX A DISTRIBUTION LIST**

### *Federal Government Agencies*

Mr. Kevin Haggerty  
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Mr. Michael P. Jansky  
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Dr. Benjamin Tuggle  
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### *Native American Groups*

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San Juan Pueblo, New Mexico 87566

Governor John Antonio, Sr.  
Pueblo of Laguna  
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Governor Robert Benavides  
Pueblo of Isleta  
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Chairman Ronnie Lupe  
Tribal Council  
White Mountain Apache  
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Chairman Benjamin Nuvamsa  
Hopi Tribal Council  
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***State and Local Government Agencies***

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State Historic Preservation Officer  
Department of Cultural Affairs  
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The Honorable Bill Richardson  
Governor of New Mexico  
490 Old Santa Fe Trail, Room 400  
Santa Fe, New Mexico 87501



## **APPENDIX B CONSULTATIONS AND PUBLIC COMMENTS**

This appendix contains copies of the consultation letter from DOE to the New Mexico State Historic Preservation Officer (page B-2) and the response (page B-11). DOE sent similar letters to the pueblo governors and tribal officials of the following Native American groups who have expressed interest in federal actions in Bernalillo County (page B-13):

- Hopi Tribe (response on p. B-20),
- Navajo Nation,
- Ohkay Owingeh San Juan Pueblo,
- Pueblo of Isleta,
- Pueblo of Laguna (response on page B-24),
- Pueblo of Sandia,
- White Mountain Apache Tribe, and
- Ysleta del Sur Pueblo.

DOE also sent a letter to the USFWS for Section 7 consultation under the Endangered Species Act (page B-25), and the USFWS responded to concur with DOE's finding (page B-37).

In addition, this appendix contains a copy of the comment letter from EPA (page B-39); Section 1.5 contains DOE's response).



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR • Morgantown, WV • Pittsburgh, PA



July 14, 2010

Ms. Jan V. Biella  
State Historic Preservation Officer  
Department of Cultural Affairs  
New Mexico Historic Preservation Division  
Bataan Memorial Building  
407 Galisteo Street, Suite 236  
Santa Fe, New Mexico 87501

**RE: U.S. Department of Energy Consultation on the Proposed Installation of a Solar Photovoltaic and Storage Battery System in Bernalillo County, New Mexico**

Dear Ms. Biella:

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial assistance grant to the Public Service Company of New Mexico (PNM) as part of the Smart Grid Technologies Program, which is funded through the American Recovery and Reinvestment Act of 2009. If PNM received the grant, it would install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical line to tie the battery into PNM's existing power distribution system (the proposed project). PNM would also install, at its own expense, a collocated 500-kilowatt solar photovoltaic array. The goal would be to employ the battery, along with a sophisticated control system, to turn solar power into a reliable, dispatchable distributed-generation resource.

Attachment 1 provides information for the Section 106 review under the National Historic Preservation Act. It includes maps and photographs.

The project site would be on the eastern portion of a 27-acre PNM-owned parcel of land southeast of Albuquerque, New Mexico. The site is undeveloped. The installation would cover about 8 acres. The direct Area of Potential Effects (APE) would be the 8-acre parcel and the routes of the 3,000-foot electrical tie-in to the existing power distribution system and access road. The potential effects would include nominal short-term noise during the construction phase and alteration of the visual characteristics of the existing landscape. The battery would be on an impermeable pad and surrounded by a cinder-block wall or chain-link fence.

Past cultural surveys have been conducted in the area of the project. A June 2010 cultural resource survey performed by Cienega Environmental of Albuquerque, NM, confirmed the location of a single previously identified archeological site (LA 72051) within the 27-acre parcel, and found four other isolated occurrences. The 100-percent pedestrian survey was performed under New Mexico Archaeological Survey Permit Number NM-10-241. ARMS designated the survey as New Mexico Cultural Resource Information System Activity Number 117759. Should

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3510 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507



your office require a copy of this survey, on your request DOE will provide it under separate cover to protect the location of sites.

As designed, the proposed project would avoid any disturbance to LA 72051. If any intact cultural materials are discovered during the installation, all work would cease and the New Mexico State Historic Preservation Office and the PNM Environmental Services Department would be contacted. Attachment 1 provides additional information on cultural surveys and previously recorded sites.

DOE is preparing an environmental assessment (EA) for this proposed project. The Department will send you a copy of the draft EA and respond to any specific comments you might have. DOE will also include correspondence with your office in an appendix to the EA.

In addition, through the New Mexico Historic Preservation Division, DOE has identified Native American tribes (see Attachment 2) that have an interest in proposed projects in Bernalillo County, New Mexico. DOE has sent each of those Pueblo Governors and Tribal Officials letters to request information the tribes might have on properties of traditional, religious, or cultural significance near the proposed PNM project site. DOE will provide each interested pueblo or tribe a copy of the Draft EA and will respond to any comments they might have. DOE will reproduce correspondence between DOE and the tribal leaders in an appendix to the EA.

Based on the location of the project site, the above-noted factors, the information in Attachment 1, and the expected results of the analyses for the EA, DOE has determined that no historic buildings, structures, districts, objects, or archaeological resources would be affected by the proposed project pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800. DOE asks the Department of Cultural Affairs for its concurrence.

If you have questions or require clarification, please contact me at (304) 285-5219 or at [fred.pozzuto@netl.doe.gov](mailto:fred.pozzuto@netl.doe.gov). Thank you in advance for your consideration.

Sincerely,



Fred Pozzuto  
Environmental Manager / NEPA Compliance Officer

Encls:  
Attachment 1, Section 106 Consultation  
Attachment 2, List of Consulted Tribes

**Attachment 1**  
**Section 106 Consultation**

Project Description: PNM's proposed project (the undertaking) is to use a federal financial assistance grant (DOE's Proposed Action) to install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to PNM's existing power distribution system. The project would involve three main activities: (1) site preparation, including the parking lot and access road, (2) the receipt, placement, and hookup of the storage battery, and (3) the construction of the 3,000-foot electrical tie-in to PNM's existing power distribution system. The battery would be on an impermeable pad and surrounded by a cinder-block wall or chain-link fence.

PNM would also install, at its own expense, a 500-kilowatt collocated solar photovoltaic (PV) array. The goal would be to employ the storage battery, along with a sophisticated control system, to turn solar power into a reliable, dispatchable, distributed-generation resource. This pilot plant would demonstrate the mitigation of fluctuations in voltage and storage of energy for later use when customer demand peaks (i.e., voltage smoothing and peak-shifting capabilities).

Site Description: PNM owns the proposed project site, which is undeveloped; it has no structures, roads, or other improvements. There are, however, small, unpaved trails that recreational off-road motorcycles and dune buggies use. The site is close to level with a gentle northward slope. The site is southeast of Albuquerque, New Mexico, and is about 0.25 mile south and east of Interstate Highway 25 on Los Picaros Road in Bernalillo County.

The proposed project site is on 27-acre PNM-owned parcel and is defined as Tract A-2 Plat A-1 and A-2 Sunset Memorial Park, Bernalillo County, New Mexico, Section 16, Township 9 North, Range 3 East, New Mexico Plat Map, recorded in Bernalillo County in Book 2008C, Page 221.

The site is amid large tracts of similar undeveloped acreage. Some of this acreage is part of the developing Mesa del Sol mixed-use community. The proposed project is about 1.4 miles southwest of Kirkland Air Force Base and the Albuquerque International Sunport. The Journal Pavilion, an open-air live-performance venue, is near the site boundary to the southeast. A few small commercial developments lie to the west along Los Picaros Road. The western adjoining property is a storage yard for construction materials.

Maps and Photographs: Figure 1 shows the U.S. Geological Survey Aztec, NM 7.5-minute quadrangle that identifies the proposed project area. Figure 2 shows the site boundary and the elements of the proposed project, as well as the area PNM might use for the PV array. Figure 3 shows views of and around the site.

Area of Potential Effects (APE): The APE is the 8-acre site within the 27-acre PNM-owned parcel for the proposed undertaking and the approximate routes of the electrical tie-in and access road. The areas are identified on Figure 2.

Historic and Cultural Resources: Eleven archaeological surveys have been conducted in or near the project area. The majority of the PNM parcel was surveyed in 1989 by Rio Abajo

Archaeological Services. In 1996, the University of New Mexico Office of Contract Archeology surveyed portions of Picaros Road SE adjacent to the portion of the electrical feeder line within the municipal right-of-way. In 2007, Taschek Environmental completed a survey for a PNM transmission line that re-recorded LA 72051. In June 2010, Cienega Environmental conducted a 100-percent pedestrian survey of the property and confirmed LA 72051 and four other isolated occurrences; one of the isolated occurrences is a 13-foot (4-meter)-long fence segment of two-strand barbed wire; the other three sites contained flaked obsidian stone. With regard to LA 72051, Cienega Environmental concurred with the site's potential eligibility for inclusion to the National Registry of Historic Places under Criterion D of the National Historic Preservation Act. LA 72051 is a lithic scatter of unknown cultural and temporal origin.

The proposed undertaking as designed would completely avoid any disturbance to site LA 72051. If intact cultural materials were discovered during the installation, all work would cease and the New Mexico State Historic Preservation Office and PNM's Environment Services Department would be contacted. Other previously recorded sites within about 500 meters (1,600 feet) of the proposed project site include LA site numbers 112792 (corral) and 112901 (railroad track/bed). DOE believes the proposed undertaking could avoid any disturbance to these sites as well.

Native American Tribes: DOE reviewed the Native American consultation information on the Department of Cultural Affairs Historic Preservation Division website to identify which Native American tribes have interest in proposed projects in Bernalillo County, New Mexico. The following tribes have indicated an interest, and the Department has sent consultation letters to the Pueblo Governors and Tribal Officials of each and will provide a copy of the draft EA for their consideration:

- Hopi Tribe
- Isleta Pueblo
- Laguna Pueblo
- Navajo Nation
- Ohkay Owingeh (San Juan) Pueblo
- Sandia Pueblo
- White Mountain Apache Tribe
- Ysleta del Sur

Funding Source: DOE is proposing to provide a financial assistance grant to the Public Service Company of New Mexico as part of the Smart Grid Technologies Program funded through the American Recovery and Reinvestment Act of 2009. The grant would be for approximately \$1.8 million; the estimated total project cost would be about \$5.9 million.

Responsible Federal Agency and Contact:

U.S. Department of Energy

Mr. Fred Pozzuto  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
Building 1 MS B07  
Morgantown, West Virginia 26507-0880  
[Fred.pozzuto@netl.doe.gov](mailto:Fred.pozzuto@netl.doe.gov)

Figure 1. U.S. Geological Survey Aztec, NM 7.5-minute quadrangle.

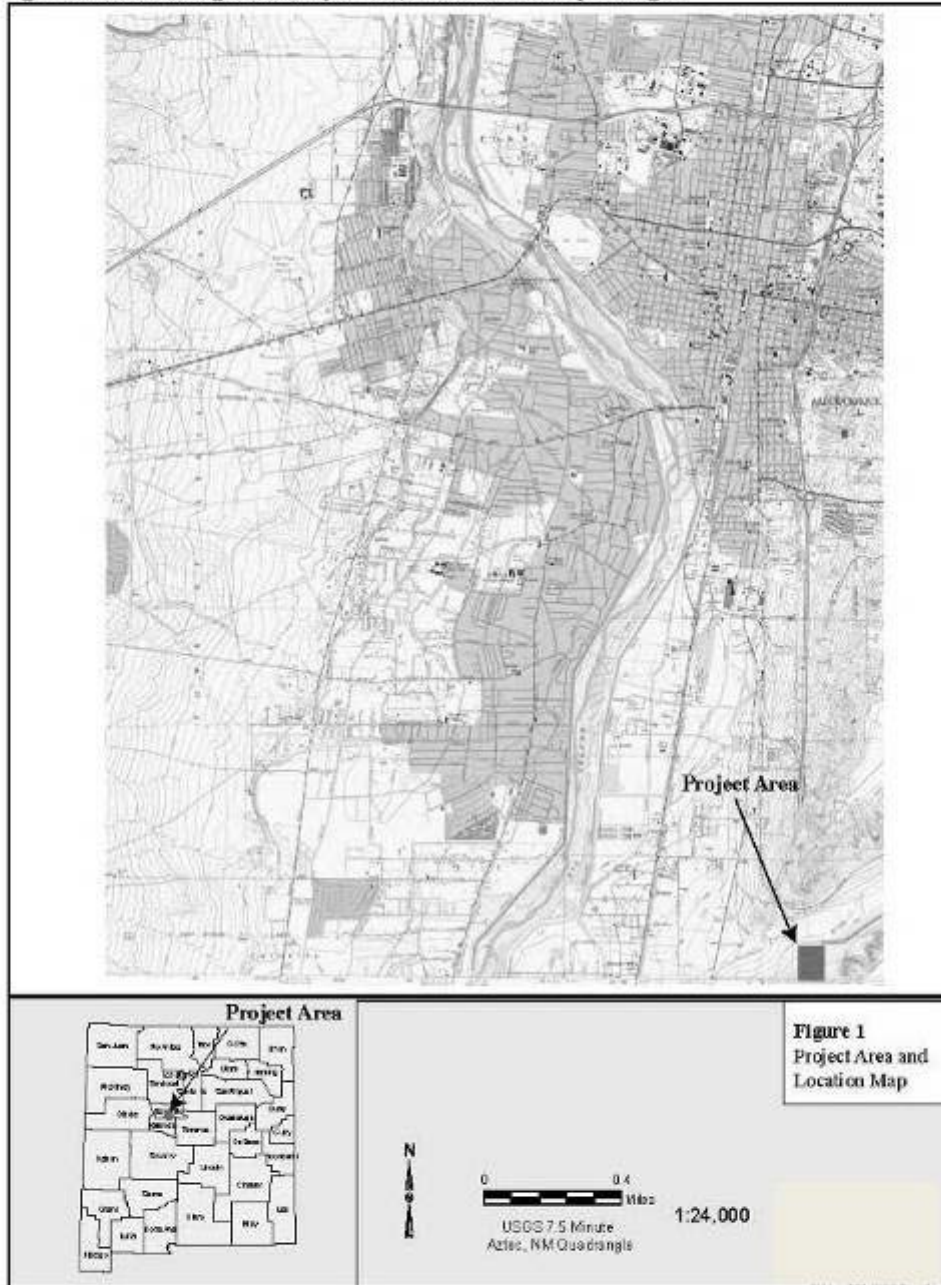
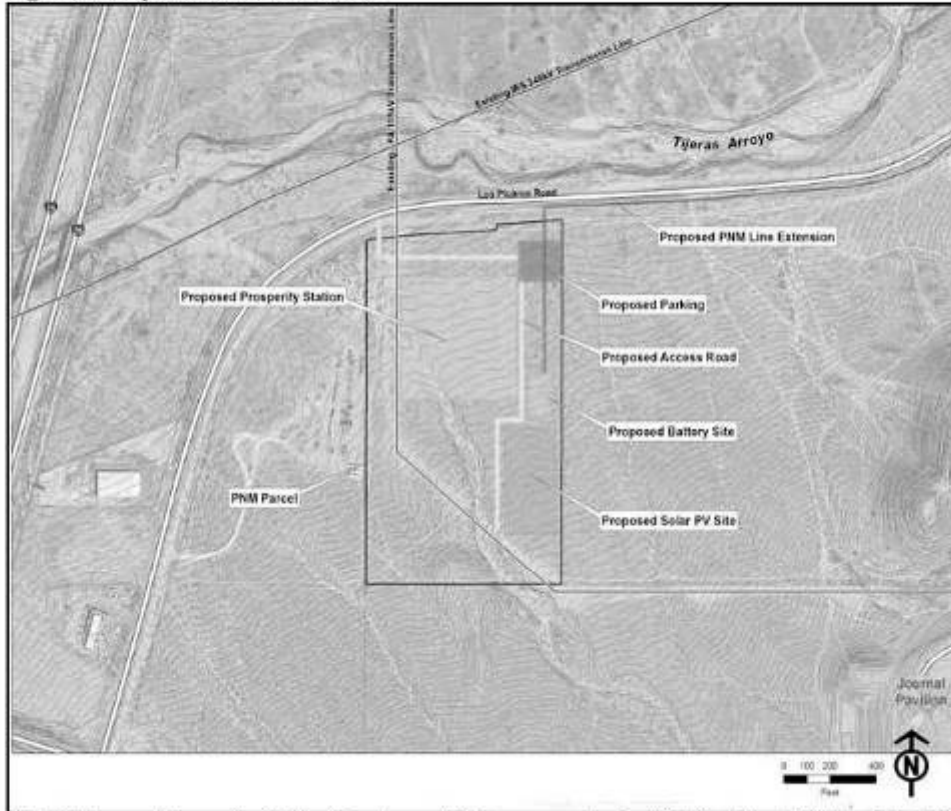


Figure 1  
Project Area and  
Location Map

Figure 2. Proposed site and facilities.\*



\* The "Proposed Prosperity Station" is not a part of the proposed project in this letter; PNM could build it several years in the future.

Figure 3. Views of and around the site.



Looking west at storage yard



Looking East



Looking North



Looking South

**Attachment 2**  
**List of Consulted Tribes**

DOE has sent letters to each of the following tribes. A copy of the letter to one of the tribes follows.

- Hopi Tribe,
- Navajo Nation,
- Ohkay Owingeh San Juan Pueblo,
- Pueblo of Isleta,
- Pueblo of Laguna,
- Pueblo of Sandia,
- White Mountain Apache Tribe, and
- Ysleta del Sur Pueblo.





**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR • Morgantown, WV • Pittsburgh, PA



July 12, 2010

089886

Ms. Jan V. Biella  
State Historic Preservation Officer  
Department of Cultural Affairs  
New Mexico Historic Preservation Division  
Bataan Memorial Building  
407 Galisteo Street, Suite 236  
Santa Fe, NM 87501



**RE: U.S. Department of Energy Consultation on the Proposed Installation of a Solar Photovoltaic and Storage Battery System in Bernalillo County, New Mexico**

Dear Ms. Biella:

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial assistance grant to the Public Service Company of New Mexico (PNM) as part of the Smart Grid Technologies Program, which is to be funded through the American Recovery and Reinvestment Act of 2009 (Recovery Act). If PNM received the grant, it would install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical line to tie the battery into PNM's existing power distribution system (the proposed project). PNM would also install, at its own expense, a collocated 500-kilowatt solar photovoltaic array. The goal would be to employ the battery, along with a sophisticated control system, in order to turn solar power into a reliable, dispatchable distributed-generation resource of the electrical grid network.

Attachment 1 provides information for the Section 106 review under the National Historic Preservation Act. It includes maps and photographs.

The project site would be on the eastern portion of a 27-acre parcel of land southeast of Albuquerque, New Mexico, which is owned by the PNM. The site is currently undeveloped. The project would affect an approximate 8-acre portion of this parcel. The direct Area of Potential Effects (APE) would be the 8-acre portion, the routes of the 3,000-foot electrical tie-in to the existing power distribution system, and access roadway. Further potential effects would include nominal short-term noise during the construction phase and alteration of the visual characteristics of the existing landscape. The battery system would be located on an impermeable pad and surrounded by a cinder-block wall or chain-link fence.

Several cultural resource surveys have been conducted in the area of the project in the past. In June 2010, Cienega Environmental of Albuquerque, NM performed a cultural resource survey specifically for this project. They confirmed the location of a single, previously identified, archeological site (LA 72051) within the 27-acre parcel, and found four other isolated occurrences. Further, a 100-percent pedestrian survey was performed under New Mexico

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507

Archaeological Survey Permit Number NM-10-241. ARMS designated the survey as New Mexico Cultural Resource Information System Activity Number 117759. Should your office require a copy of this survey, upon your request, DOE will provide this additional detailed information under a separate cover to protect the location and integrity of sites. ?

As designed, the proposed project would avoid any disturbance to LA 72051. If any cultural materials were to be discovered during the construction phase of the project, all work would cease until the New Mexico State Historic Preservation Office and the PNM Environmental Services Department is contacted and corrective measures implemented. Attachment 1 provides additional information on cultural surveys and previously recorded sites.

DOE is preparing an environmental assessment (EA or Draft EA) for this proposed project. The Department will send you a copy of the draft EA where you may again respond to any specific comments you might have. DOE will also include correspondence(s) with your office in an appendix to the EA.

In addition, through the New Mexico Historic Preservation Division, DOE has identified Native American tribes (see Attachment 1) that have an interest in proposed projects in Bernalillo County, New Mexico. DOE has sent each of those Pueblo Governors and Tribal Officials letters to request information the tribes might have on properties of traditional, religious, or cultural significance near the proposed PNM project site. DOE will also provide each interested pueblo or tribe a copy of the Draft EA and will respond to any comments they might have. DOE will reproduce correspondence between DOE and the tribal leaders in an appendix to the EA.

Based on the location of the project site and the above-noted factors, the information in Attachment 1, and the expected results of the analyses for the EA, DOE has determined that no historic buildings, structures, districts, objects, or archaeological resources would be affected by the proposed project, pursuant to Section 106 of the National Historic Preservation Act and 36 CFR Part 800. DOE asks the Department of Cultural Affairs for its concurrence.

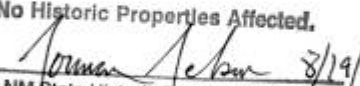
If you have questions or require clarification, please contact me at (304) 285-5219 or at fred.pozzuto@netl.doe.gov. Thank you in advance for your consideration.

Sincerely,



Fred Pozzuto  
Environmental Manager / NEPA Compliance Officer

Encls:  
Attachment 1

No Historic Properties Affected.  
 8/19/10  
for NM State Historic Preservation Officer



**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
Albany, OR • Morgantown, WV • Pittsburgh, PA



July 14, 2010

Governor Marcelino Aguino  
Ohkay Owingeh  
P.O. Box 1099  
San Juan Pueblo, New Mexico 87566

**RE: U.S. Department of Energy Consultation on the Proposed Installation of a Solar Photovoltaic and Storage Battery System in Bernalillo County, New Mexico**

Dear Mr. Aguino:

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial assistance grant (DOE's Proposed Action) to the Public Service Company of New Mexico (PNM) as part of the Smart Grid Technologies Program, which is funded through the American Recovery and Reinvestment Act of 2009. If PNM received the grant, it would install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical line to tie the battery into PNM's existing power distribution system (the proposed project). PNM would also install, at its own expense, a 500-kilowatt collocated solar photovoltaic array. The goal would be to employ the battery, along with a sophisticated control system, to turn solar power into a reliable, dispatchable, distributed-generation resource of the electrical grid network. This project would utilize a portion (8 acres) of a 27-acre parcel of land in Bernalillo County, New Mexico that is currently owned by PNM.

DOE is writing you because of the interest your Pueblo has expressed about potential projects in Bernalillo County, as indicated on the State of New Mexico's Department of Cultural Affairs Historic Preservation Division website. DOE is requesting information or concerns you may have on properties of traditional, religious, or cultural significance in the vicinity of the proposed PNM project site. Any information you provide will assist the Department in the preparation of an environmental assessment (EA) and fulfillment of its responsibilities under Section 106 of the National Historic Preservation Act.

As designed, the proposed project would avoid any disturbance to any cultural or archeological sites. If any cultural materials were to be discovered during the construction phase of the project, all work would cease until the New Mexico State Historic Preservation Office and the PNM Environmental Services Department is contacted and corrective measures implemented.

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3510 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507

DOE will provide you a copy of the Draft EA in several weeks where you may again respond to any specific concerns you may have. All correspondence(s) with your office will be included in an appendix to the EA. At this time, DOE is anticipating a 21-day public comment period.

Attachment 1 provides information for the proposed project. It includes maps and photographs.

If you have questions or require clarification, please telephone me at (304) 285-5219, or e-mail me at [fred.pozzuto@netl.doe.gov](mailto:fred.pozzuto@netl.doe.gov).

Thank you in advance for your consideration.

Sincerely,



Fred Pozzuto  
Environmental Manager / NEPA Compliance Officer

Encls:  
Attachment 1

Cc: Ms. Jan V. Biella, New Mexico State Historic Preservation Officer

**Attachment 1**  
**Section 106 Consultation**

Project Description: PNM's proposed project (the undertaking) is to use a federal financial assistance grant (DOE's Proposed Action) to install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to PNM's existing power distribution system. The project would involve three main activities: (1) site preparation, including the parking lot and access road, (2) the receipt, placement, and hookup of the storage battery, and (3) the construction of the 3,000-foot tie-in to PNM's existing power distribution system. The battery would be on an impermeable pad and surrounded by a cinder-block wall or chain-link fence.

PNM would also install, at its own expense, a 500-kilowatt collocated solar photovoltaic (PV) array. The goal would be to employ the battery, along with a sophisticated control system, to turn solar power into a reliable, dispatchable distributed-generation resource. This pilot plant would demonstrate the mitigation of fluctuations in voltage and storage of energy for later use when customer demand peaks (i.e. voltage smoothing and peak-shifting capabilities).

Site Description: PNM owns the 27-acre parcel of land, the eastern 8 acres of which would be the proposed project site. The land is undeveloped; it has no structures, roads, or other improvements. There are, however, small, unpaved trails that recreational off-road motorcycles and dune buggies use. The site is close to level with a gentle northward slope. The site is southeast of Albuquerque, New Mexico, and is about 0.25 mile south and east of Interstate Highway 25 on Los Picaros Road in Bernalillo County.

The site is defined as Tract A-2 Plat A-1 and A-2 Sunset Memorial Park, Bernalillo County, New Mexico, Section 16, Township 9 North, Range 3 East, New Mexico Plat Map, recorded in Bernalillo County in Book 2008C, Page 221.

The site is amid large tracts of similar undeveloped acreage. Some of this acreage is part of the developing Mesa del Sol mixed-use community. The Journal Pavilion, an open-air live-performance venue, is near the site boundary to the southeast. A few small commercial developments lie to the west along Los Picaros Road. The western adjoining property is a storage yard for construction materials.

Eleven archaeological surveys have been conducted in or near the project area. Most of the PNM parcel was surveyed in 1989. In 1996, a survey was conducted along portions of Picaros Road SE adjacent to the portion of the electrical feeder line within the municipal right-of-way. In 2007, a survey was conducted for a PNM transmission line. In June 2010, a 100-percent pedestrian survey of the property was conducted specifically for this project; that confirmed that the previously identified site LA 72051 is eligible for inclusion to the National Register of Historic Places; there is lithic scatter of unknown cultural and temporal origin at this site.

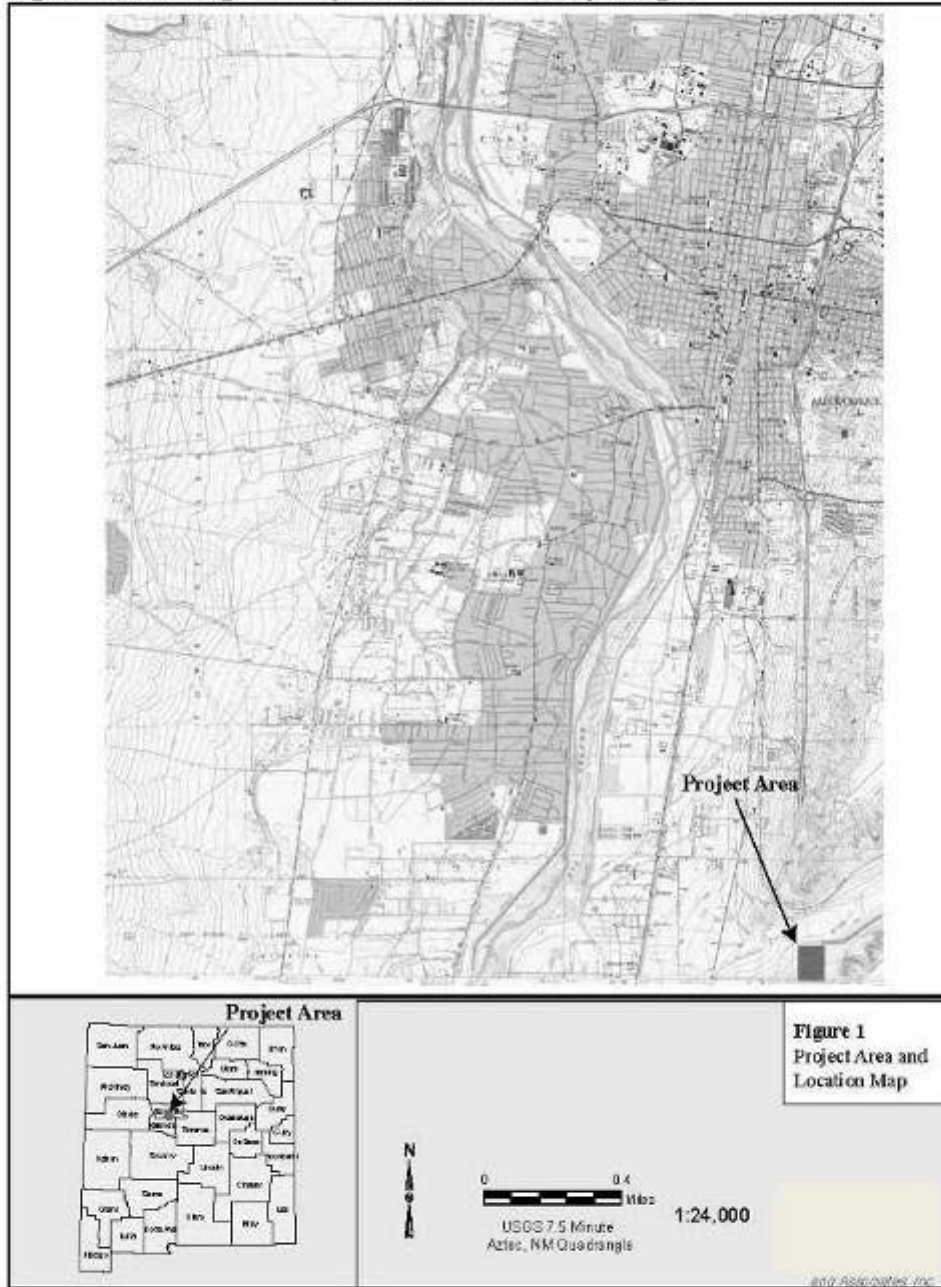
As designed, the proposed project would avoid any disturbance to LA 72051. If any cultural materials were to be discovered during the construction phase of the project, all work would cease until the New Mexico State Historic Preservation Office and the PNM Environmental Services Department is contacted and corrective measures implemented.

Four other isolated occurrences were identified; one of the isolated occurrences is a 13-foot (4-meter)-long fence segment of two-strand barbed wire; the other three sites contained flaked obsidian stone. Other previously recorded sites include LA 112792 (corral) and 112091 (railroad track/bed). The pedestrian survey was performed under New Mexico Archaeological Survey Permit Number NM-10-241. ARMS designated the survey as New Mexico Cultural Resource Information System Activity Number 117759. *Should your office require a copy of this survey, upon your request, DOE will provide this additional detailed information under a separate cover to protect the location and integrity of sites.* DOE believes the proposed undertaking could avoid any disturbance to these sites as well.

Maps and Photographs: Figure 1 shows the U.S. Geological Survey Aztec, NM 7.5-minute quadrangle that identifies the project area. Figure 2 shows the site boundary and the elements of the proposed project, as well as the area PNM would use for the PV array. Figure 3 shows views of and around the site.

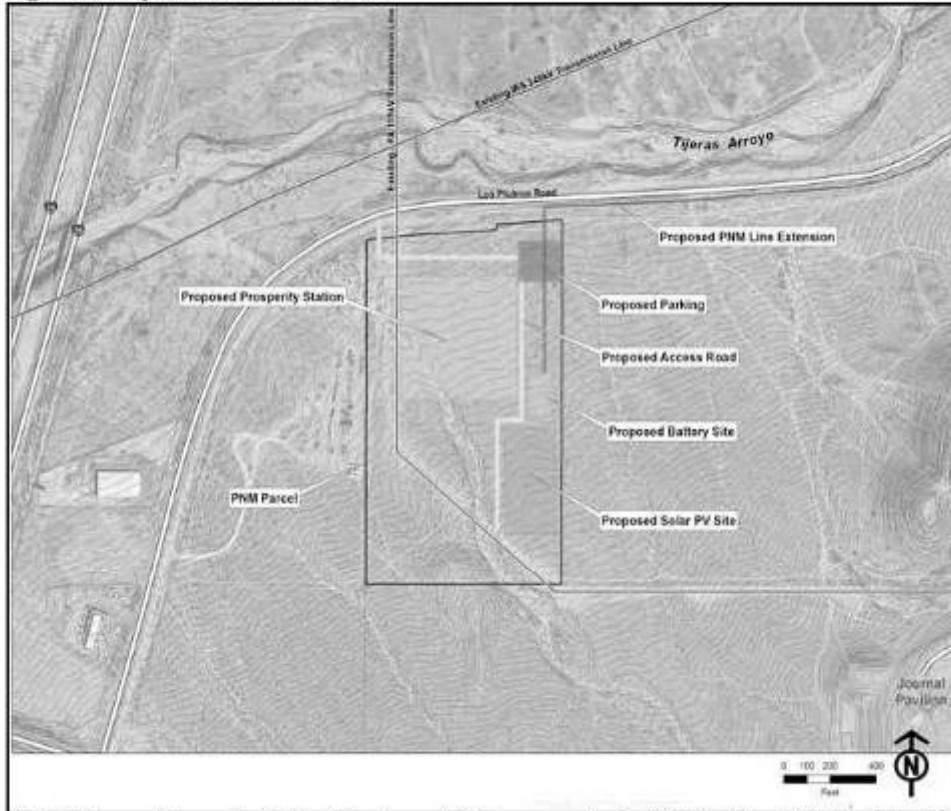
Area of Potential Effects (APE): The APE is the 8-acre site within the 27-acre PNM-owned parcel and the approximate routes of the electrical tie-in and access road. The areas are identified on Figure 2.

Figure 1. U.S. Geological Survey Aztec, NM 7.5-minute quadrangle.



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Figure 2. Proposed site and facilities.\*



\* The "Proposed Prosperity Station" is not a part of the proposed project in this letter; PNM could build it several years in the future. Exact cultural resources revealed under the June 2010 study are not shown to protect the location and integrity of sites.



Figure 3. Views of and around the site.



Looking west at storage yard



Looking East



Looking North



Looking South

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2010 Collier Farm Road, P.O. Box 600, Worsham, WV 25567





**NATIONAL ENERGY TECHNOLOGY LABORATORY**  
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August 4, 2010

RECEIVED  
AUG 12 2010  
BY: *[Signature]*

Dear Reader:

The Department of Energy (DOE) invites comments on the enclosed document, *Draft Environmental Assessment for the Public Service Company of New Mexico Photovoltaic Plus Battery for Simultaneous Voltage Smoothing and Peak Shifting Project, Bernalillo County, New Mexico* (DOE/EA-1754D). The Draft Environmental Assessment (Draft EA) can also be found on DOE's National Energy Technology Laboratory (NETL) website at <http://www.netl.doe.gov/publications/others/nepa/ca.html>.

DOE prepared the Draft EA in accordance with the Council on Environmental Quality's National Environmental Policy Act (NEPA) implementing regulations (40 CFR Parts 1500-1508) and DOE's NEPA implementing procedures (10 CFR Part 1021). It evaluates the potential environmental impacts of DOE's providing a financial assistance grant under the American Recovery and Reinvestment Act of 2009 to the Public Service Company of New Mexico (PNM) under a cooperative agreement between PNM and DOE as part of DOE's Smart Grid Demonstrations Program. PNM plans to install a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system. PNM would also install separately, at its own expense, a utility-scale solar photovoltaic array with an output of about 500 kilowatts. The goal is to use the battery and a sophisticated control system to increase the reliability and facilitate the dispatch of the electricity generated by the solar array.

DOE's proposed action is to provide PNM with a \$1.8 million grant under a cost-sharing arrangement. The total cost of site preparation, equipment installation, and start up of PNM's proposed project would be about \$5.9 million.

The Draft EA evaluates the resource areas DOE commonly addresses in EAs and identified no significant adverse environmental impacts from DOE's proposed action or PNM's proposed project. The project could result in beneficial impacts to the nation's energy efficiency and the local economy and air quality. Operating this renewable energy project would not generate carbon dioxide and could result in a decrease in carbon dioxide emissions from regional power plants. In addition, there would be small, positive socioeconomic impacts from the expenditures for the project.

A Notice of Availability will be published in the *Albuquerque Journal* on August 8, 9, and 10, 2010, to announce the beginning of the 21-day public review and comment period. As stated in the notice, comments should be marked "PNM Draft EA Comments" and sent to:

---

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507

Mr. Fred Pozzuto  
U.S. Department of Energy  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
P.O. Box 880, MS B07  
Morgantown, WV 26507-0880  
Email: fred.pozzuto@netl.doe.gov  
Facsimile: 1-304-285-4403

Individual names and addresses, including email addresses, received as part of the comment documents normally are considered part of the public record. Persons wishing to withhold names, addresses, or other identifying information from the public record must state this request prominently at the beginning of their comments. DOE will honor this request to the extent allowed by law. All submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses will be included in the public record and open to public inspection in their entirety.


The public comment period ends on August 28, 2010. DOE will consider late submissions to the extent practicable.

Sincerely,



Fred Pozzuto  
Environmental Manager / NEPA Compliance Manager

If the identified National Register eligible historic structure is avoided and protected, the Hopa Cultural Preservation Office concurs that a determination of "no historic properties affected" is appropriate for this undertaking

  
Kwadwo Owusu  
8-12-10



**PUEBLO OF LAGUNA**

P.O. BOX 194  
LAGUNA, NEW MEXICO 87026



(505) 552-6598  
(505) 552-8854  
(505) 552-6855

July 21, 2010

Mr. Fred Pozzuto  
Environmental Manager/NEPA Compliance Officer  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
P.O. Box 880  
Morgantown, WV 26507

Dear Mr. Pozzuto:

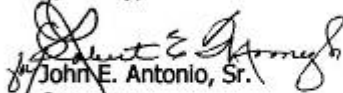
RE: U.S. Department of Energy Consultation on the Proposed Installation of a Solar Photovoltaic and Storage Battery System in Bernalillo County, New Mexico

The Pueblo of Laguna appreciates your consideration to comment on the possible interests your projects may have on any traditional or cultural properties.

The Pueblo of Laguna has determined that the undertaking WILL NOT have a significant impact at this time. However, in the event that any new archaeological sites are discovered and any new artifacts are removed, we request to be notified to review items. We also request photographs of items. According to our unpublished migration history, our ancestors journeyed from the north through that area and settled for periods of time before traveling to our present location. Therefore, the possibilities of some findings may exist.

We thank you and your staff for the information provided.

Sincerely,

  
John E. Antonio, Sr.  
Governor  
Pueblo of Laguna



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Albany, OR • Morgantown, WV • Pittsburgh, PA



July 9, 2010

Mr. Wally Murphy  
Field Supervisor  
U.S. Fish and Wildlife Service  
2105 Osuna Road NE  
Albuquerque, NM 87113-1001

RE: Section 7 Consultation under the Endangered Species Act

Dear Mr. Murphy,

The U.S. Department of Energy (DOE or the Department) is proposing to provide a financial assistance grant (DOE's Proposed Action) to the Public Service Company of New Mexico (PNM) as part of the Smart Grid Technologies Program, which is funded through the American Recovery and Reinvestment Act of 2009. If PNM received the grant, it would install a utility-scale storage battery, an access road, a parking lot, and a 3,000-foot underground electrical line to tie the battery into its existing power distribution system (the proposed project). PNM would also install, at its own expense, a collocated 500-kilowatt solar photovoltaic array. The goal would be to employ the battery, along with a sophisticated control system, to turn solar power into a reliable, dispatchable distributed-generation resource.

This project would use a 27-acre parcel of land in Bernalillo County, New Mexico that is currently owned by PNM.

This parcel is located approximately 1.5 miles south of Albuquerque International Sunport to the southern side of Albuquerque as indicated on Figure 1. The elements of the proposed project would impact about 8 acres of the 27-acre parcel. The site is currently undeveloped and is adjacent to similar undeveloped land.

Two species on the federal endangered species list, the black-footed ferret (*Mustela nigripes*) and the Rio Grande silvery minnow (*Hybognathus amarus*), could occur on the site or be affected by project activities. DOE reviewed the U.S. Fish and Wildlife Service (FWS) list of federally endangered and threatened species that are known to occur in Bernalillo County and found no other threatened or endangered species that might occur on the site.

A biological survey (attached) found no suitable habitat on the site for either of the two listed endangered species. The black-footed ferret requires a large population of prey, and there was no evidence of suitable prey in or near the project area. Further, the site has little aquatic habitat to support the Rio Grande silvery minnow since it is positioned upslope of Tijeras Arroyo. However, this arroyo discharges into designated habitat for the minnow in the Rio Grande River. The project will be designed so that any hazardous and/or toxic materials would be self-contained within the battery enclosure. Further, PNM would grade the site so that all runoff would flow away from Tijeras Arroyo.

---

3610 Collins Ferry Road, P.O. Box 880, Morgantown, WV 26507

Since construction activities would affect only a small area (8 acres) and be short term, the potential for erosion would be low. PNM would manage the project under an approved soil erosion and mitigation plan. PNM would minimize destruction of existing ground cover and would return any other disturbed areas during site preparation and construction to pre-existing conditions.

In relation to migratory birds, if any construction activities occurred during the nesting season, PNM would survey the site to ensure there were no active migratory nests present. If that survey found nests, PNM would take steps to avoid impacts or develop mitigation actions.

Based on the above information, DOE determined that there would be no adverse effects to federally threatened or endangered species

An environmental assessment (EA) is being prepared and will be released to the public in the next several weeks. DOE will provide your office a copy of the EA and where you may further comment on any of your concerns. All correspondence between DOE and the FWS will be included in an appendix to the EA. At this time, DOE anticipates a 21-day public comment period for this proposed project.

DOE asks for your concurrence and thanks you in advance for your consideration.

Please forward the results of your review and any requests for additional information to:

Mr. Fred Pozzuto  
Environmental Manager / NEPA Compliance Officer  
U.S. Department of Energy  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
Building 1, MS B07  
Morgantown, West Virginia 26507-0880  
Email: [fred.pozzuto@netl.doe.gov](mailto:fred.pozzuto@netl.doe.gov)  
Tele: 304-285-5219

Sincerely,

Fred Pozzuto  
Environmental Manager / NEPA Compliance Officer

**Attachments**

1. Figure 1. Project Location
2. Biological Survey for Tijeras Canyon 500kw Solar Field and Battery Demonstration Project

Figure 1. U.S. Geological Survey Aztec, NM 7.5-minute quadrangle.

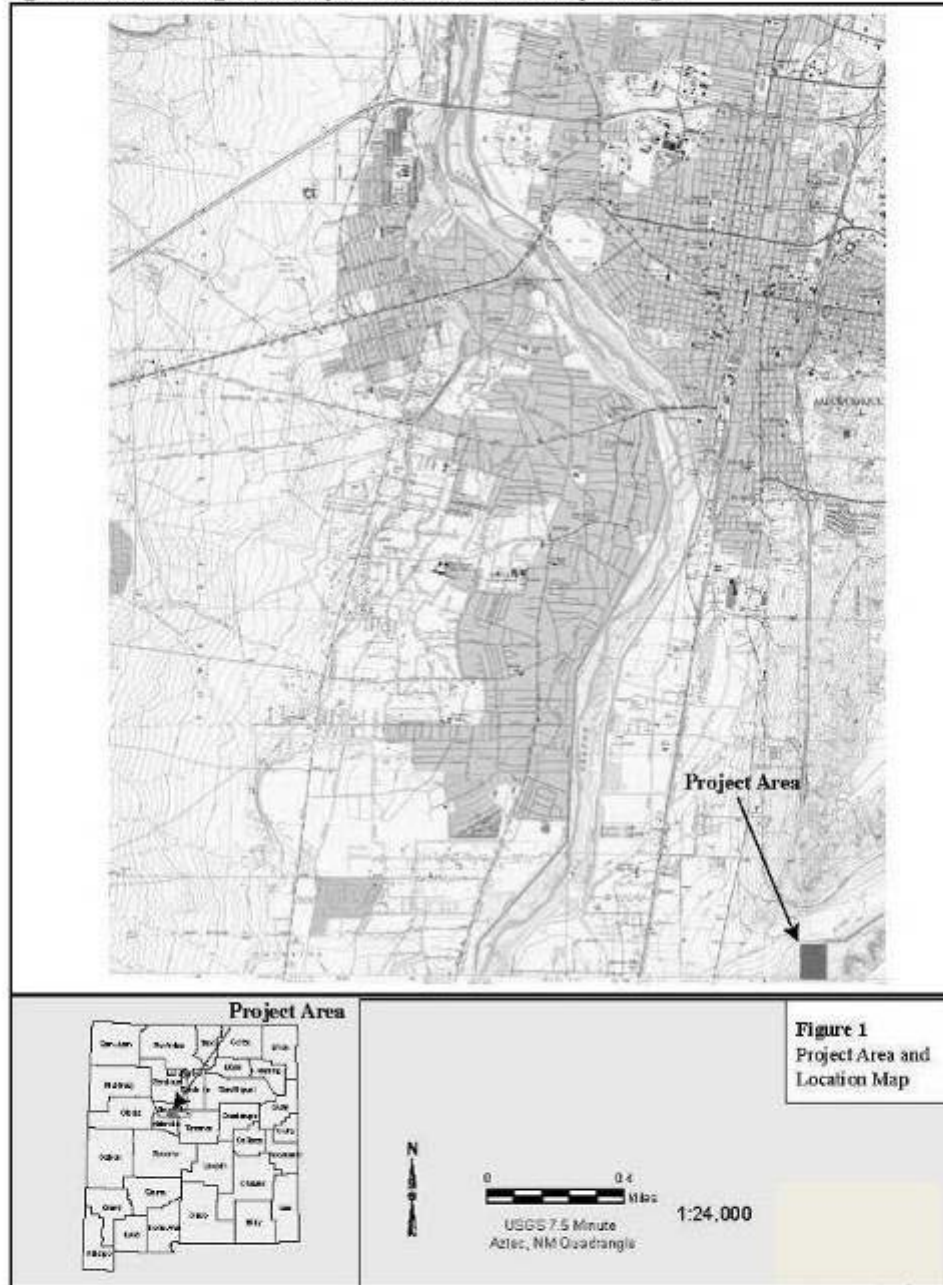


Figure 1  
Project Area and  
Location Map





7511 Fourth Street NW  
Albuquerque, NM 87107  
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April 22, 2010

Mr. Doug Campbell  
Manager, Environmental Planning and Permitting  
Environmental Services Department  
PNM  
Alvarado Square  
Albuquerque, NM 87158-2104  
[zapper@swcp.com](mailto:zapper@swcp.com)

Re: Biological Survey for Tijeras Canyon 500kw Solar Field and Battery Demonstration Project

Dear Mr. Campbell:

Thank you allowing Marron and Associates (Marron) the opportunity to provide environmental services for the above project. Marron was tasked to provide information on the project site to include an observed species list, soil description, and list of potential vertebrates that could be present on the site, as well as an assessment of the potential for disturbance to affect state or federally listed species. The following is our letter report of the findings that includes the assessment of state and federal protected species and soil description.

#### Introduction

Marron conducted a pedestrian biological survey of the Tijeras Canyon 500kw Solar Field and Battery Demonstration Project area on April 21, 2010. Conditions were calm, sunny and warm, and both birds and reptiles were active. The site is located on the south side of Albuquerque, New Mexico in Bernalillo County (Figure 1). The site is situated on the south side of Tijeras Canyon approximately 0.25 miles east of Interstate 25 (I-25) within the SW1/4 of Section 16 in Township 9N, Range 3E. The site consists of a 30-acre rectangular area ranging from approximately 5040 to 5100 feet in elevation above mean sea level. The site is set on a gently sloping north-facing aspect, situated just south and above the main channel of Tijeras Arroyo (Figure 2). The center of this 30-acre tract occurs at approximately UTM Z13 E350806/N3874236. The survey area also included a proposed transmission line corridor located along the south side of Bobby Foster road extending from the project area approximately 1500 feet where it intercepts an existing transmission line.

#### Vegetation

The dominant vegetation within the area consists of Desert Grassland with a shrub component. The dominant plant species within the lower northwest corner of the site is dominated by four-wing saltbush (*Atriplex canescens*), mormon tea (*Ephedra trifurca*), sand dropseed (*Sporobolus cryptandrus*), sand sage (*Artemisia filifolia*), and snakeweed (*Gutierrezia sarothrae*). There were a large number of spring annuals present including several species of tansy mustards (*Descurainia* sp.), plantain (*Plantago patagonica*), scorpionweed (*Phacelia corrugata*), and spectacle pod (*Damorphocarpa wislizenii*). The vegetation within the northeast corner of the site was much more depauperate with only scattered sand sage and four-wing saltbush and almost no grass cover. The entire southern half of the site was well vegetated with an extensive stand of black grama (*Bouteloua eriopoda*) intermixed with sand dropseed, spike dropseed (*Sporobolus contractus*), and plains dropseed (*Sporobolus flexuosus*) as well as sub-shrubs such as mormon tea along with scattered sand sage. In total 48 species of vascular plants, representing 18 plant families, were found within the project boundaries. There were no rare or unusual plants, nor were there any wetlands or unique plant habitats present. Attachment A contains a list of all of the vascular plant species encountered on this site.

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#### Wildlife

Twenty species of wildlife were observed within the project area and included ten species of birds, six species of mammals, and four species of reptiles. There were no aquatic habitats or amphibians in the project area. Birds observed in the project area included red-tailed hawk (*Buteo jamaicensis*), northern mockingbird (*Mimus polyglottus*), scaled quail (*Callipepla squamata*), curved-billed thrasher (*Taxostoma curvirostre*), western kingbird (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), cliff swallow (*Petrochelidon pyrrhonota*), turkey vulture (*Cathartes aura*), and loggerhead shrike (*Lanius ludovicianus*). There were significant numbers of small mammals present as evidenced by numerous small burrows and mounds. These included banner-tailed kangaroo rat (*Dipodomys spectabilis*), Ord's kangaroo rat (*Dipodomys ordii*), Botta's pocket gopher (*Thomomys bottae*), desert cottontail (*Sylvilagus auduboni*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*) tracks. Aside from coyote tracks, there were no large mammals present in the project area. Nor were there any indications of wildlife trails or seasonal wildlife movement through the area. Four species of reptiles were noted in the project area and included the little striped whiptail (*Aspidoscelis inornata*), common checkered whiptail (*Aspidoscelis tessellata*), common side-blotched lizard (*Uta stansburiana*), and southwestern fence lizard (*Sceloporus cowlesi*). There are likely several other species of lizards present in the area as well as several species of snakes. Other lizards documented in the general area surrounding the site include New Mexico whiptail (*Aspidoscelis newmexicana*) and lesser earless lizard (*Holbrookia maculata*). At least three species of snakes have been documented in nearby locations. These include the bull snake, prairie rattler (*Crotalus viridis*), and massasauga rattler (*Sistrurus catenatus*). However, there were no rare or unusual lizards, birds, or mammals in the project area, nor were there any rare or significant wildlife habitats present. Attachment B contains a list of all of the wildlife species observed in the project area.

#### Migratory Birds

Although the survey was conducted within the breeding season for many birds, there were no bird nests noted within any of the shrubs in the project area, nor were there any indications of ground-nesting birds within the project limits. An active northern mockingbird nest was noted within a bush on the bottom of the drainage approximately 50 feet south but outside of the boundary of the project area. There is also some indication that there may be a red-tailed hawk nest site within a juniper tree located approximately one-third mile south of the south boundary of the project area. However, if present, this nest site is likely to be far enough away to be unaffected by the project activities. A solitary loggerhead shrike was noted moving through the bushes along the northern boundary of the project area; however, all of the shrubs in that area were examined and there were no loggerhead shrike nests present. Although there were numerous burrows within the project area, there were no western burrowing owls present. It is possible that some of the smaller migratory birds that nest later in the season could establish nest sites within the shrubs of the project area, but presently there are no nests present in the project area. If construction of the facility is scheduled to occur during the nesting season (April to mid-September) then it is recommended that a nesting bird survey be conducted to ensure that there are no active migratory bird nests within the proposed project limits.

#### Rare, Threatened, and Endangered Species

Over thirty species of agency status species occur in Bernalillo County. Seven of these could occur within the project area (Table 1). One additional species, the Rio Grande Silvery Minnow, is not expected in the project area, but could potentially be indirectly affected by project activities.

There was no suitable habitat for any listed federal threatened or endangered species within the project area. Black-footed ferret (federal endangered), require large populations as a prey base and there were prairie dogs either within or adjacent to the project area. Consequently, black-footed ferret would not occur in the project area.

TABLE 1  
RELEVANT PROTECTED SPECIES FOR THE PROJECT AREA

SPECIES	FEDERAL STATUS	STATE STATUS
<i>Mustela nigripes</i> (black-footed ferret)	E	-----
<i>Hypognathus amarus</i> (Rio Grande silvery minnow)	E	E
<i>Athene cunicularia hypoleuca</i> (western burrowing owl)	SOC MBTA	-----
<i>Ammodramus bairdii</i> (Baird's sparrow)	SOC MBTA	T
<i>Charadrius montanus</i> (mountain plover)	SOC MBTA	-----
<i>Falco peregrinus anatum</i> (American peregrine falcon)	SOC MBTA	T
<i>Falco peregrinus tundrius</i> (Arctic peregrine falcon)	SOC MBTA	T
<i>Haliaeetus leucocephalus</i> (bald eagle)	MBTA	T

E - Endangered, T - Threatened, PT - Proposed Threatened, C - Candidate, SOC - Species of Concern, S - Sensitive

The project area is composed of dry upland habitats, but it does occur upslope from Tijeras Arroyo, which is located just north of the project area. Tijeras Arroyo discharges into designated critical habitat for the Rio Grande silvery minnow and could act as a conveyance for hazardous materials into the Rio Grande. There will be no construction activities within Tijeras Arroyo. However, currently the drainage plan for the construction site has not been finalized. If runoff from the site cannot be contained within the site boundaries then consultation should be initiated with the U.S. Fish and Wildlife Service (USFWS) to ensure that any hazardous materials that may be utilized at the site are not conveyed into the designated critical habitat for the Rio Grande silvery minnow.

The Arctic and American Peregrine falcon (USFWS species of concern) could fly over the project area hunting; however, there is no suitable nesting, perching, or roosting habitat anywhere within the project limits.

Bald eagles winter in the Rio Grande Valley and hunt both along the river valley and occasionally on the adjacent mesas. It is possible that bald eagles could fly over the project area but there is no suitable nesting, roosting, or perching habitat within the project limits. The proposed project activity is not anticipated to affect this species.

Baird's sparrow (USFWS species of concern) could also potentially move through the project area during migration, but there were no bird nests anywhere within the project area. It is not anticipated that Baird's sparrow would nest in the project area, nor would it likely be adversely affected by the proposed action.

Mountain plover has been documented in degraded grassland habitats around Albuquerque. The project area is dominated by Desert Grassland, however, the structure of this grassland was not suitable for use by the mountain plover. It was not present in the project area and because of the habitat structure it is not expected in the project area. This species would not be affected by the project.

Western burrowing owls (USFWS species of concern) are usually associated with prairie dog burrows or burrows of species such as rabbits. Although there were no prairie dogs present and very few rabbits, there were many kangaroo rat burrows present. Western burrowing owls have been documented utilizing hammer-tailed kangaroo rat burrows at nearby Kirtland Air Force Base as well as other locations along the north side of Albuquerque. Consequently, suitable habitat for the western burrowing owl occurred within the project area. However, a detailed survey of all burrows within the project limits was conducted and there were no indications of western burrowing owl use of the area. It is still possible that western burrowing owls could move into the project area over the next few weeks but currently there were no western burrowing owls in the project area. Additionally, burrowing owls could move into the project area during the next breeding season. Since there is suitable habitat for the western burrowing owl the site should be surveyed prior to construction to ensure that they have not established breeding territories within the proposed construction limits. Depending upon the year, the breeding season for western burrowing owls can extend from March to October. Under current conditions, the project will have no effect upon burrowing owls and under the currently proposed actions there are no anticipated effects upon this species. However, final determination of effect cannot be accomplished until a preconstruction survey of the site is completed.

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**Soils and Vegetation**

The Natural Resource Conservation Service (NRCS) identifies the soils within the project area as Bluepoint Loamy Fine Sand (one-nine percent slopes). These Bluepoint Series soils are generally deep, excessively drained soils that formed in sandy alluvium and eolian deposits on alluvial fans and terraces. The soils at the site fit the general description of the Bluepoint Loamy Fine Sand with the exception that there is a substantial coarse and medium and component as well as widely scattered gravel throughout the area. These coarse soils and gravels appear to erode out of fluvial deposits associated with the proto-Rio Grande. The presence of scattered obsidian nodules and some small pieces of ruff suggest that at least some of the source material may have been derived from strata deposited during eruptions of the Jemez Caldera. NRCS lists these soils as having a severe hazard of soil blowing. Although these soils are listed as having slow runoff (due to their great permeability) they are subject to surface erosion. Past observations of similar habitats in the Albuquerque area have noted that these loose sandy soils can be mobilized by sheet flow during convective storm events when heavy rainfalls can occur in excess of one inch per hour. The presence of these loosely consolidated soils, combined with the slope of the site, opens the potential for large sediment laden stormwater surges that could discharge into Tijeras Arroyo. This type of event would likely be amplified if the bunch grass and shrub cover that currently dominates most of the site were removed. The perennial grasses such as black grama and various dropseed species that dominate the site help stabilize these mobile soils. Additionally, Tijeras Canyon is a divide between the Sandia and Manzano mountain ranges and when large frontal systems pass through central New Mexico, air pressure gradients between the east and west sides of these mountain ranges and can generate intense winds that blow through Tijeras Canyon. These wind events are particularly abundant during the early spring, but can also occur from more localized events such as the movement of convective storms through the area. If the vegetation cover from the site were removed, these fine sandy soils would be subject to severe soil blowing. One possible solution would be to generate a low-stature ground cover of perennial grasses that would help stabilize these mobile soils during both wind and rain events.

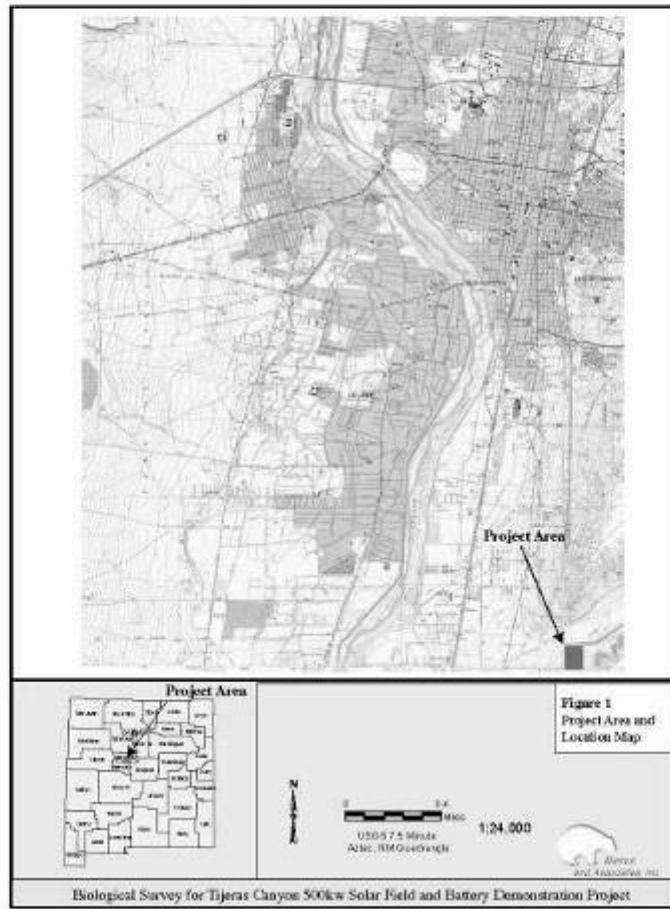
Again, thank you for the opportunity to work with you and PNM. If you have any questions, please feel free to call me at 505-898-8848.

Sincerely,

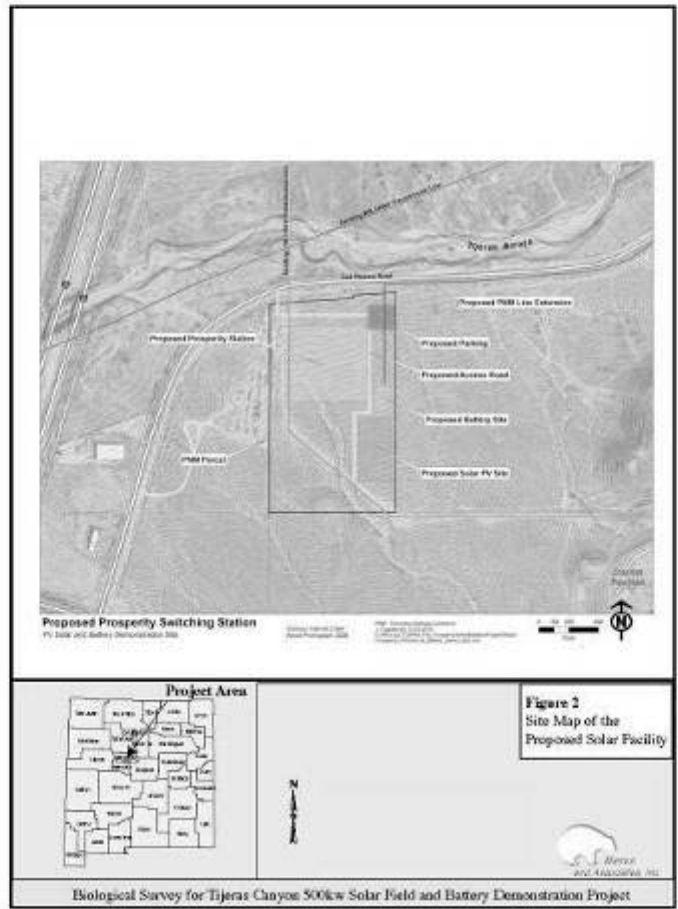
Paul J. Knight  
Marron and Associates

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ATTACHMENT A  
PLANT SPECIES OBSERVED WITHIN THE TLERAS CANYON 500KW SOLAR FIELD  
AND BATTERY DEMONSTRATION PROJECT

**AGAVACEAE (Agave Family)**

*Yucca glauca* Nutt. (Small soapweed yucca)

**AMARANTHACEAE (Amaranth Family)**

*Tidestromia lanuginosa* (Nutt.) Standl. (Wolly tidestromia)

**ASTERACEAE (Sunflower Family)**

*Ambrosia acanthicarpa* Hook. (Flatspine bursage)  
*Artemisia bigelovii* Gray (Bigelow sage)  
*Artemisia filifolia* Torr. (Sand sage)  
*Baileya multiradiata* Harvey & Gray ex Gray (Desert baileya)  
*Chaetopappa ericoides* (Torr.) Nesom (Least daisy)  
*Gutierrezia microcephala* (DC.) Gray (Threadleaf snakeweed)  
*Gutierrezia sarothrae* (Pursh) Britt. & Rusby (Broom snakeweed)  
*Hymenopappus filifolius* Hook. (Finleaf hymeropappus)  
*Hymenoxys* sp. (Bitterweed)  
*Machaeranthera canescens* (Pursh) Gray (Hoary aster)  
*Machaeranthera pinnatifida* (Hook.) Shinnery (Golden aster)  
*Townsendia annua* Beaman annual Townsend daisy

**BORAGINACEAE (Borage Family)**

*Cryptantha angustifolia* (Torr.) Greene (Panamint cryptantha)  
*Cryptantha minima* Rydb. (Little cryptantha)

**BRASSICACEAE (Mustard Family)**

*Descurainia pinnata* (Walter) Britton (Western tansymustard)  
*Descurainia sophia* (L.) Webb ex Prantl (Tansy mustard)  
*Dimorphocarpa wislizeni* (Engelm.) Rollins (Spectaclepod)  
*Sisymbrium irio* L. (London rocket)

**CACTACEAE (Cactus Family)**

*Opuntia clavata* Engelm. (Club cholla)  
*Opuntia phaeacantha* Engelm. (Prickly pear)

**CHENOPODIACEAE (Goosefoot Family)**

*Atriplex canescens* (Pursh) Nutt. (Fourwing saltbush)  
*Krascheninnikovia lanata* (Pursh) A.D.J. Meeuse & Smit (Winterfat)  
*Salsola tragus* L. (Tumbleweed)

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**EPHEDRACEAE (Jointfir Family)**

*Ephedra torreyana* S. Wats. (Torrey jointfir)

**FABACEAE (Bean Family)**

*Caesalpinia jamesii* (Torr. & Gray) Fisher (James holdback)

*Psoralea scoparius* (Gray) Rydb. (Broom dalea)

**HYDROPHYLLACEAE (Waterleaf Family)**

*Nama dichotomum* (R&P) Choisy (Nama)

*Phacelia crenulata* Torr. ex S. Wats. var. *corrugata* (A. Nels.) Brand (Scorpion weed)

**LOASACEAE (Loasa Family)**

*Menziesia multiflora* (Nutt.) Gray (Blazing-star)

**NYCTAGINACEAE (Four-o'clock Family)**

*Abronia elliptica* A. Nelson fragrant white sand verbena

**MALVACEAE (Mallow Family)**

*Sphaeralcea incana* Torr. ex Gray (Gray globemallow)

*Sphaeralcea parvifolia* A. Nelson (Smallflower globemallow)

**ONAGRACEAE (Evening Primrose Family)**

*Oenothera pallida* Lindl. ssp. *pallida* (Pale primrose)

**PLANTAGINACEAE**

*Plantago patagonica* Jacq. (Wooly plantain)

**POACEAE (Grass Family)**

*Achnatheron hymenoides* (Roemer & J.A. Schultes) Barkworth (Indian ricegrass)

*Aristida divaricata* Humb. & Bonpl. ex Willd. (Poverty threeawn)

*Aristida purpurea* Nutt. var. *longiseta* (Steud.) Vasey (Red threeawn)

*Bouteloua eriopoda* (Torr.) Torr. (Black grama)

*Dasyochloa pulchella* (Kunth) Willd. ex Rydb. (Fluff grass)

*Sporobolus contractus* A.S. Hitchc. (Spike dropseed)

*Sporobolus cryptandrus* (Torr.) Gray (Sand dropseed)

*Sporobolus flexuosus* (Thurb. ex Vasey) Rydb. mesa dropseed

**POLYGONACEAE (Buckwheat Family)**

*Eriogonum pharacoides* Torr. (Wirestem buckwheat)

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**SCROPHULARIACEAE**

*Penstemon ambiguus* Torr. (White-bush beardstorgue)

**SOLANACEAE (Potato Family)**

*Lycium torreyi* Gray (Squawthorn)

*Solanum elaeagnifolium* Cav. (Silverleaf nightshade)

**ATTACHMENT B  
ANIMAL SPECIES OBSERVED OR INDICATED  
WITHIN THE TIJERAS CANYON 500KW SOLAR FIELD AND BATTERY  
DEMONSTRATION PROJECT**

**BIRDS**

<b>Common Name</b>	<b>Scientific Name</b>
American crow	<i>Corvus brachyrhynchos</i>
Cassin's sparrow	<i>Aimophila cassinii</i>
Cliff swallow	<i>Hirundo pyrrhonota</i>
Curved-billed thrasher	<i>Toxostoma curvirostre</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Scaled quail	<i>Callipepla squamata</i>
Turkey vulture	<i>Cathartes aura</i>
Western kingbird	<i>Tyrannus verticalis</i>

**MAMMALS**

<b>Common Name</b>	<b>Scientific Name</b>
Banner-tailed kangaroo rat	<i>Dipodomys spectabilis</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Botta's Pocket gopher	<i>Thomomys bottae</i>
Coyote	<i>Canis latrans</i>
Desert cottontail	<i>Sylvilagus auduboni</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>

**REPTILES AND AMPHIBIANS**

<b>Common Name</b>	<b>Scientific Name</b>
Common checkered whiptail	<i>Aspidoscelis tessellata</i>
Little striped whiptail	<i>Aspidoscelis inornata</i>
Side-blotched lizard	<i>Uta stansburiana</i>
Southwestern fence lizard	<i>Sceloporus cowlesi</i>

April 22, 2010 – 10



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New Mexico Ecological Services Field Office  
2105 Osuna NE  
Albuquerque, New Mexico 87113  
Phone: (505) 346-2525 Fax: (505) 346-2542

August 3, 2010

Cons. #22420-2010-I-0100

Fred Pozzuto, Environmental Manager  
U.S. Department of Energy, National Energy Technology Laboratory  
3610 Collins Ferry Road  
Building 1, MS B07  
P.O. Box 880  
Morgantown, WV 26507-0880

Thank you for your letter dated July 12, 2010 regarding consultation under section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1534 et seq.) for the Tijeras Canyon 500 kw Solar Field and Battery Demonstration Project. You transmitted the results of a biological survey and requested Service concurrence with effects determinations made by the U.S. Department of Energy (DOE).

DOE proposes to provide a financial assistance grant under the American Recovery and Reinvestment Act of 2009 in a cooperative agreement with the Public Service Company of New Mexico (PNM) as part of the Smart Grid Demonstrations Program. If PNM received the funding, the company would install a 2- to 4-megawatt-hour advanced absorbed valve-regulated lead acid battery, an access road, a parking lot, and a 3,000-foot underground electrical tie-in to the existing power distribution system (the proposed project). PNM would also install separately, at its own expense, a collocated utility-scale solar photovoltaic array with an output of about 500 kilowatts. The goal would be to use the battery, along with a sophisticated control system, to turn solar energy into a reliable, dispatchable distributed-generation resource. Two species listed as federally endangered, the Rio Grande silvery minnow (*Hybognathus amarus*) (silvery minnow) and the black-footed ferret (*Mustela nigripes*) could occur on the site or could potentially be affected by project activities. DOE has determined that the proposed action may affect, but will not adversely affect the silvery minnow, its designated critical habitat, or the black-footed ferret.

The Service concurs with DOE's determinations that the proposed action "may affect, not likely to adversely affect" the black-footed ferret, the silvery minnow or its designated critical habitat. Our concurrence is based on the following understanding of the proposed Project:

- Site preparation and installation of the battery, the parking lot, and separately installed solar array would occupy only 8 acres within the larger 27-acre parcel. Habitat disruption would be minimal.

Fred Pozzuto, Environmental Manager

2

- The biological survey of the site conducted on April 21, 2010 found no suitable habitat for either the black-footed ferret or the silvery minnow.
- The black-footed ferret requires a large population of prey, and there was no evidence of suitable prey in or near the project area.
- Prairie dogs were found in or adjacent to the project site.
- The silvery minnow is not likely to occur on the site, but the site is upslope of Tijeras Arroyo, which discharges into designated habitat for the minnow in the Rio Grande River. Because of the system design, all hazardous and toxic materials would be self-contained within the battery enclosure. Discharges into designated silvery minnow critical habitat are unlikely.
- The arroyos are dry most of the year, but stormwater runoff flows through them, most heavily in the summer.
- Construction activities would affect only a small area (8 acres) and be short term, so the potential for erosion would be low.


The proposed action will include the following conservation measures:

- PNM will slope the site so that all runoff will flow away from Tijeras Arroyo.
- PNM will manage the project under a soil erosion and mitigation plan.
- PNM will minimize destruction of existing ground cover and will return any other areas it disturbed during site preparation and construction (and not hosting project equipment) to more natural conditions.

Please contact the Service to verify the above determination and concurrence are still valid if: 1) future surveys detect listed, proposed or candidate species in habitats where they have not been previously observed; 2) the project is changed or new information reveals effects of the action to the listed species or their habitats to an extent not considered in these evaluations; or 3) a new species is listed that may be affected by this Project.

This concludes section 7 consultation on the proposed Tijeras Canyon 500 kw Solar Field and Battery Demonstration Project. The Service appreciates DOE's concern for endangered species and New Mexico's wildlife habitats. In future communications regarding this letter or the proposed project please refer to Consultation #22420-2010-I-0100. If you have any questions concerning this letter, please contact Lori Robertson of my staff at (505) 761-4710.

Sincerely,

  
Wally Murphy  
Field Supervisor

cc:

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 6  
1445 ROSS AVENUE, SUITE 1200  
DALLAS, TX 75202-2733**

**August 26, 2010**

Mr. Fred Pozzuto  
U.S. Department of Energy  
National Energy Technology Laboratory  
3610 Collins Ferry Road  
P. O. Box 880, MS B07  
Morgantown, WV 26507-0880

Dear Mr. Pozzuto:

The Environmental Protection Agency (EPA) Region 6 has received your correspondence, dated August 4, 2010, regarding the Draft Environmental Assessment (EA) for the Public Service Company of New Mexico Photovoltaic Plus Battery for Simultaneous Voltage Smoothing and Peak Shifting Project, Bernalillo County, New Mexico (DOE/EA-1754D). EPA provides the following comments regarding the proposed project that should assist in the development of alternatives and mitigation:

Section 3.1.1 notes that "EPA has designated Bernalillo County as an attainment area for all criteria pollutants" as of 2010. While it is true that the area is not currently in nonattainment of any criteria pollutant standards, Albuquerque/Bernalillo County was classified as a moderate carbon monoxide (CO) nonattainment area under the 1990 Clean Air Act amendments. EPA redesignated the area to attainment of the CO standard in June 1996 (61 FR 29970). This redesignation began a 20-year period of maintenance for the area, during which the area must not show any degradation of air quality from CO attainment levels.

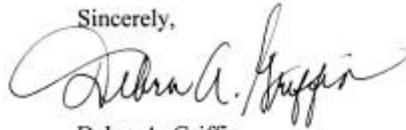
The provisions of 40 CFR 93 (General Conformity with the Clean Air Act) apply to criteria pollutant nonattainment and maintenance areas. Under 40 CFR 93.153 (Applicability Analysis), de minimis CO emissions levels of 100 tons/year (tpy) serve as a threshold for determining whether or not a more intensive general conformity analysis must be conducted for a federally-funded project in a criteria pollutant maintenance area. If project emissions are not expected to exceed 100 tpy of CO, the requirements for general conformity analysis are satisfied. Please include a comparison of anticipated project CO emissions with the de minimis CO emissions level of 100 tpy in your environmental analysis.

The EA provides a clear analysis of any possible environmental justice implications of this proposed project, as well as potential impacts on local Indian Tribes. The EA shows

that this project will not have any disproportionate or adverse effects on either low-income or minority groups, on Tribal residents, or on Tribal governments.

EPA would like to be placed on the mailing list to receive notifications and updates regarding this project, as they become available. We appreciate the opportunity to provide comments to aid you in the development of the Draft EA. If you have questions or wish to coordinate further, please contact Dr. Sharon L. Osowski, of my staff at [osowski.sharon@epa.gov](mailto:osowski.sharon@epa.gov) or by phone at 214-665-7506.

Sincerely,

A handwritten signature in cursive script, appearing to read "Debra A. Griffin".

Debra A. Griffin  
Associate Director  
Compliance Assurance and  
Enforcement Division

**APPENDIX C  
BIOLOGICAL SURVEY**

This appendix contains a copy of the 2010 biological survey.



7511 Fourth Street NW  
Albuquerque, NM 87107  
tel 505.898.8848  
fax 505.897.7847

www.marroninc.com

April 22, 2010

Mr. Doug Campbell  
Manager, Environmental Planning and Permitting  
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Thank you allowing Marron and Associates (Marron) the opportunity to provide environmental services for the above project. Marron was tasked to provide information on the project site to include an observed species list, soil description, and list of potential vertebrates that could be present on the site, as well as an assessment of the potential for disturbance to affect state or federally listed species. The following is our letter report of the findings that includes the assessment of state and federal protected species and soil description.

#### Introduction

Marron conducted a pedestrian biological survey of the Tijeras Canyon 500kw Solar Field and Battery Demonstration Project area on April 21, 2010. Conditions were calm, sunny and warm, and both birds and reptiles were active. The site is located on the south side of Albuquerque, New Mexico in Bernalillo County (Figure 1). The site is situated on the south side of Tijeras Canyon approximately 0.25 miles east of Interstate 25 (I-25) within the SW1/4 of Section 16 in Township 9N, Range 3E. The site consists of a 30-acre rectangular area ranging from approximately 5040 to 5100 feet in elevation above mean sea level. The site is set on a gently sloping north-facing aspect, situated just south and above the main channel of Tijeras Arroyo (Figure 2). The center of this 30-acre tract occurs at approximately UTM Z13 E350806/N3874236. The survey area also included a proposed transmission line corridor located along the south side of Bobby Foster road extending from the project area approximately 1500 feet where it intercepts an existing transmission line.

#### Vegetation

The dominant vegetation within the area consists of Desert Grassland with a shrub component. The dominant plant species within the lower northwest corner of the site is dominated by four-wing saltbush (*Atriplex canescens*), mormon tea (*Ephedra trifurca*), sand dropseed (*Sporobolus cryptandrus*), sand sage (*Artemisia filifolia*), and snakeweed (*Gutierrezia sarothrae*). There were a large number of spring annuals present including several species of tansy mustards (*Descuriana* sp.), plantain (*Plantago patagonica*), scorpionweed (*Phacelia corrugata*), and spectacle pod (*Dimorphocarpa wislizenii*). The vegetation within the northeast corner of the site was much more depauperate with only scattered sand sage and four-wing saltbush and almost no grass cover. The entire southern half of the site was well vegetated with an extensive stand of black grama (*Bouteloua eriopoda*) intermixed with sand dropseed, spike dropseed (*Sporobolus contractus*), and plains dropseed (*Sporobolus flexuosus*) as well as sub-shrubs such as mormon tea along with scattered sand sage. In total 48 species of vascular plants, representing 18 plant families, were found within the project boundaries. There were no rare or unusual plants, nor were there any wetlands or unique plant habitats present. Attachment A contains a list of all of the vascular plant species encountered on this site.

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**Wildlife**

Twenty species of wildlife were observed within the project area and included ten species of birds, six species of mammals, and four species of reptiles. There were no aquatic habitats or amphibians in the project area. Birds observed in the project area included red-tailed hawk (*Buteo jamaicensis*), northern mocking bird (*Mimus polyglottos*), scaled quail (*Callipepla squamata*), curved-billed thrasher (*Taxostoma curvirostre*), western kingbird (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), cliff swallow (*Petrochelidon pyrrhonota*), turkey vulture (*Cathartes aura*), and loggerhead shrike (*Lanius ludovicianus*). There were significant numbers of small mammals present as evidenced by numerous small burrows and mounds. These included banner-tailed kangaroo rat (*Dipodomys spectabilis*), Ord's kangaroo rat (*Dipodomys ordii*), Botta's pocket gopher (*Thomomys bottae*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), and coyote (*Canis latrans*) tracks. Aside from coyote tracks, there were no large mammals present in the project area. Nor were there any indications of wildlife trails or seasonal wildlife movement through the area. Four species of reptiles were noted in the project area and included the little striped whiptail (*Aspidoscelis inornata*), common checkered whiptail (*Aspidoscelis tessellata*), common side-blotched lizard (*Uta stansburiana*), and southwestern fence lizard (*Sceloporus cowlesi*). There are likely several other species of lizards present in the area as well as several species of snakes. Other lizards documented in the general area surrounding the site include New Mexico whiptail (*Aspidoscelis neomexicanus*) and lesser earless lizard (*Holbrookia maculata*). At least three species of snakes have been documented in nearby locations. These include the bull snake, prairie rattler (*Crotalus viridis*), and massasauga rattler (*Sistrurus catenatus*). However, there were no rare or unusual lizards, birds, or mammals in the project area, nor were there any rare or significant wildlife habitats present. Attachment B contains a list of all of the wildlife species observed in the project area.

**Migratory Birds**

Although the survey was conducted within the breeding season for many birds, there were no bird nests noted within any of the shrubs in the project area, nor were there any indications of ground-nesting birds within the project limits. An active northern mocking bird nest was noted within a bush on the bottom of the drainage approximately 50 feet south but outside of the boundary of the project area. There is also some indication that there may be a red-tailed hawk nest site within a juniper tree located approximately one-third mile south of the south boundary of the project area. However, if present, this nest site is likely to be far enough away to be unaffected by the project activities. A solitary loggerhead shrike was noted moving through the bushes along the northern boundary of the project area; however, all of the shrubs in that area were examined and there were no loggerhead shrike nests present. Although there were numerous burrows within the project area, there were no western burrowing owls present. It is possible that some of the smaller migratory birds that nest later in the season could establish nest sites within the shrubs of the project area, but presently there are no nests present in the project area. If construction of the facility is scheduled to occur during the nesting season (April to mid-September) then it is recommended that a nesting bird survey be conducted to ensure that there are no active migratory bird nests within the proposed project limits.

**Rare, Threatened, and Endangered Species**

Over thirty species of agency status species occur in Bernalillo County. Seven of these could occur within the project area (Table 1). One additional species, the Rio Grande Silvery Minnow, is not expected in the project area, but could potentially be indirectly affected by project activities.

There was no suitable habitat for any listed federal threatened or endangered species within the project area. Black-footed ferret (federal endangered), require large populations as a prey base and there were prairie dogs either within or adjacent to the project area. Consequently, black-footed ferret would not occur in the project area.

**TABLE 1**  
**RELEVANT PROTECTED SPECIES FOR THE PROJECT AREA**

SPECIES	FEDERAL STATUS	STATE STATUS
<i>Mustela nigripes</i> (black-footed ferret)	E	-----
<i>Hybognathus amarus</i> (Rio Grande silvery minnow)	E	E
<i>Athene cunicularia hypugea</i> (western burrowing owl)	SOC MBTA	-----
<i>Ammodramus bairdii</i> (Baird's sparrow)	SOC MBTA	T
<i>Charadrius montanus</i> (mountain plover)	SOC MBTA	----
<i>Falco peregrinus anatum</i> (American peregrine falcon)	SOC MBTA	T
<i>Falco peregrinus tundrius</i> (Arctic peregrine falcon)	SOC MBTA	T
<i>Haliaeetus leucocephalus</i> (bald eagle)	MBTA	T

E - Endangered, T - Threatened, PT - Proposed Threatened, C - Candidate, SOC - Species of Concern, S - Sensitive

The project area is composed of dry upland habitats, but it does occur upslope from Tijeras Arroyo, which is located just north of the project area. Tijeras Arroyo discharges into designated critical habitat for the Rio Grande silvery minnow and could act as a conveyance for hazardous materials into the Rio Grande. There will be no construction activities within Tijeras Arroyo. However, currently the drainage plan for the construction site has not been finalized. If runoff from the site cannot be contained within the site boundaries then consultation should be initiated with the U.S. Fish and Wildlife Service (USFWS) to ensure that any hazardous materials that may be utilized at the site are not conveyed into the designated critical habitat for the Rio Grande silvery minnow.

The Arctic and American Peregrine falcon (USFWS species of concern) could fly over the project area hunting; however, there is no suitable nesting, perching, or roosting habitat anywhere within the project limits.

Bald eagles winter in the Rio Grande Valley and hunt both along the river valley and occasionally on the adjacent mesas. It is possible that bald eagles could fly over the project area but there is no suitable nesting, roosting, or perching habitat within the project limits. The proposed project activity is not anticipated to affect this species.

Baird's sparrow (USFWS species of concern) could also potentially move through the project area during migration, but there were no bird nests anywhere within the project area. It is not anticipated that Baird's sparrow would nest in the project area, nor would it likely be adversely affected by the proposed action.

Mountain plover has been documented in degraded grassland habitats around Albuquerque. The project area is dominated by Desert Grassland, however, the structure of this grassland was not suitable for use by the mountain plover. It was not present in the project area and because of the habitat structure it is not expected in the project area. This species would not be affected by the project.

Western burrowing owls (USFWS species of concern) are usually associated with prairie dog burrows or burrows of species such as rabbits. Although there were no prairie dogs present and very few rabbits, there were many kangaroo rat burrows present. Western burrowing owls have been documented utilizing banner-tailed kangaroo rat burrows at nearby Kirtland Air Force Base as well as other locations along the north side of Albuquerque. Consequently, suitable habitat for the western burrowing owl occurred within the project area. However, a detailed survey of all burrows within the project limits was conducted and there were no indications of western burrowing owl use of the area. It is still possible that western burrowing owls could move into the project area over the next few weeks but currently there were no western burrowing owls in the project area. Additionally, burrowing owls could move into the project area during the next breeding season. Since there is suitable habitat for the western burrowing owl the site should be surveyed prior to construction to ensure that they have not established breeding territories within the proposed construction limits. Depending upon the year, the breeding season for western burrowing owls can extend from March to October. Under current conditions, the project will have no effect upon burrowing owls and under the currently proposed actions there are no anticipated effects upon this species. However, final determination of effect cannot be accomplished until a preconstruction survey of the site is completed.

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### **Soils and Vegetation**

The Natural Resource Conservation Service (NRCS) identifies the soils within the project area as Bluepoint Loamy Fine Sand (one-nine percent slopes). These Bluepoint Series soils are generally deep, excessively drained soils that formed in sandy alluvium and eolian deposits on alluvial fans and terraces. The soils at the site fit the general description of the Bluepoint Loamy Fine Sand with the exception that there is a substantial coarse and medium component as well as widely scattered gravel throughout the area. These coarse soils and gravels appear to erode out of fluvial deposits associated with the proto-Rio Grande. The presence of scattered obsidian nodules and some small pieces of tuff suggest that at least some of the source material may have been derived from strata deposited during eruptions of the Jemez Caldera. NRCS lists these soils as having a severe hazard of soil blowing. Although these soils are listed as having slow runoff (due to their great permeability) they are subject to surface erosion. Past observations of similar habitats in the Albuquerque area have noted that these loose sandy soils can be mobilized by sheet flow during convective storm events when heavy rainfalls can occur in excess of one inch per hour. The presence of these loosely consolidated soils, combined with the slope of the site, opens the potential for large sediment laden stormwater surges that could discharge into Tijeras Arroyo. This type of event would likely be amplified if the bunch grass and shrub cover that currently dominates most of the site were removed. The perennial grasses such as black grama and various dropseed species that dominate the site help stabilize these mobile soils. Additionally, Tijeras Canyon is a divide between the Sandia and Manzano mountain ranges and when large frontal systems pass through central New Mexico, air pressure gradients between the east and west sides of these mountain ranges can generate intense winds that blow through Tijeras Canyon. These wind events are particularly abundant during the early spring, but can also occur from more localized events such as the movement of convective storms through the area. If the vegetation cover from the site were removed, these fine sandy soils would be subject to severe soil blowing. One possible solution would be to generate a low-stature ground cover of perennial grasses that would help stabilize these mobile soils during both wind and rain events.

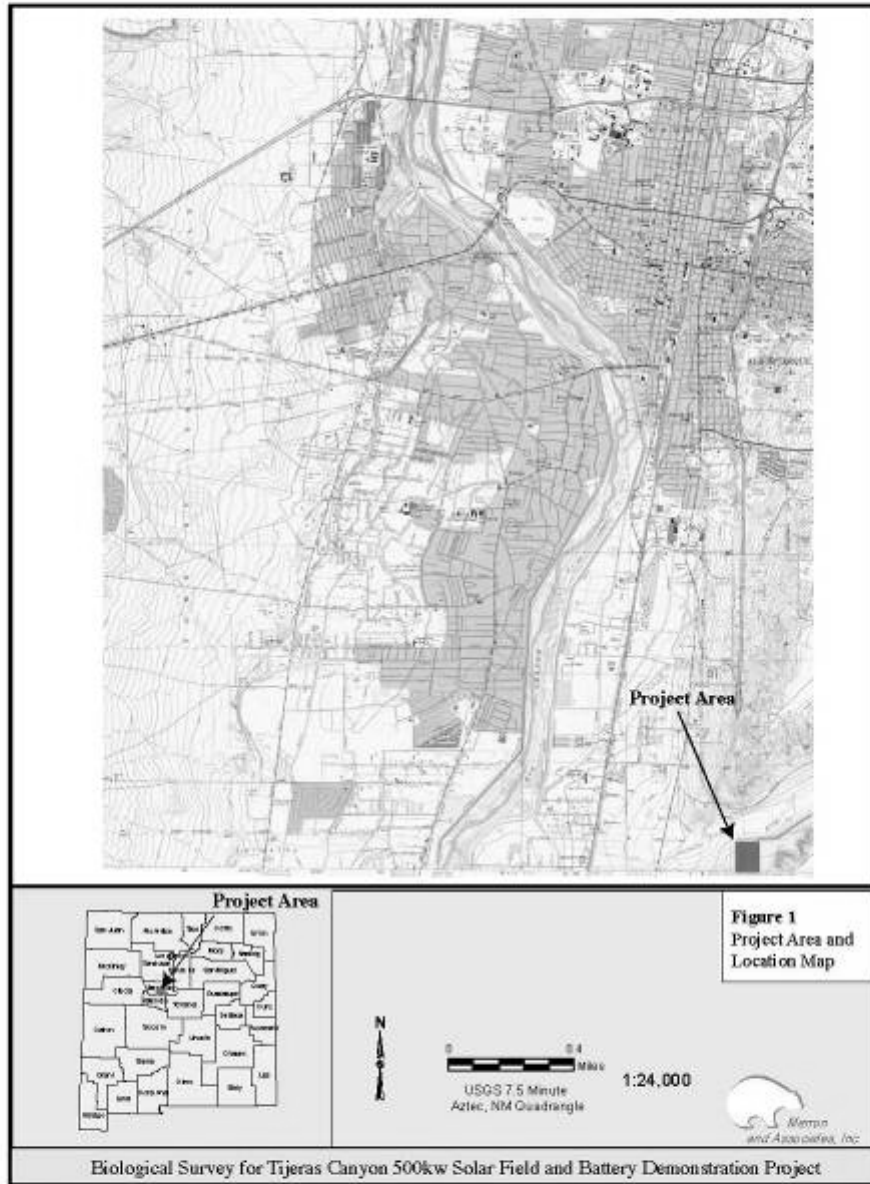
Again, thank you for the opportunity to work with you and PNM. If you have any questions, please feel free to call me at 505-898-8848.

Sincerely,

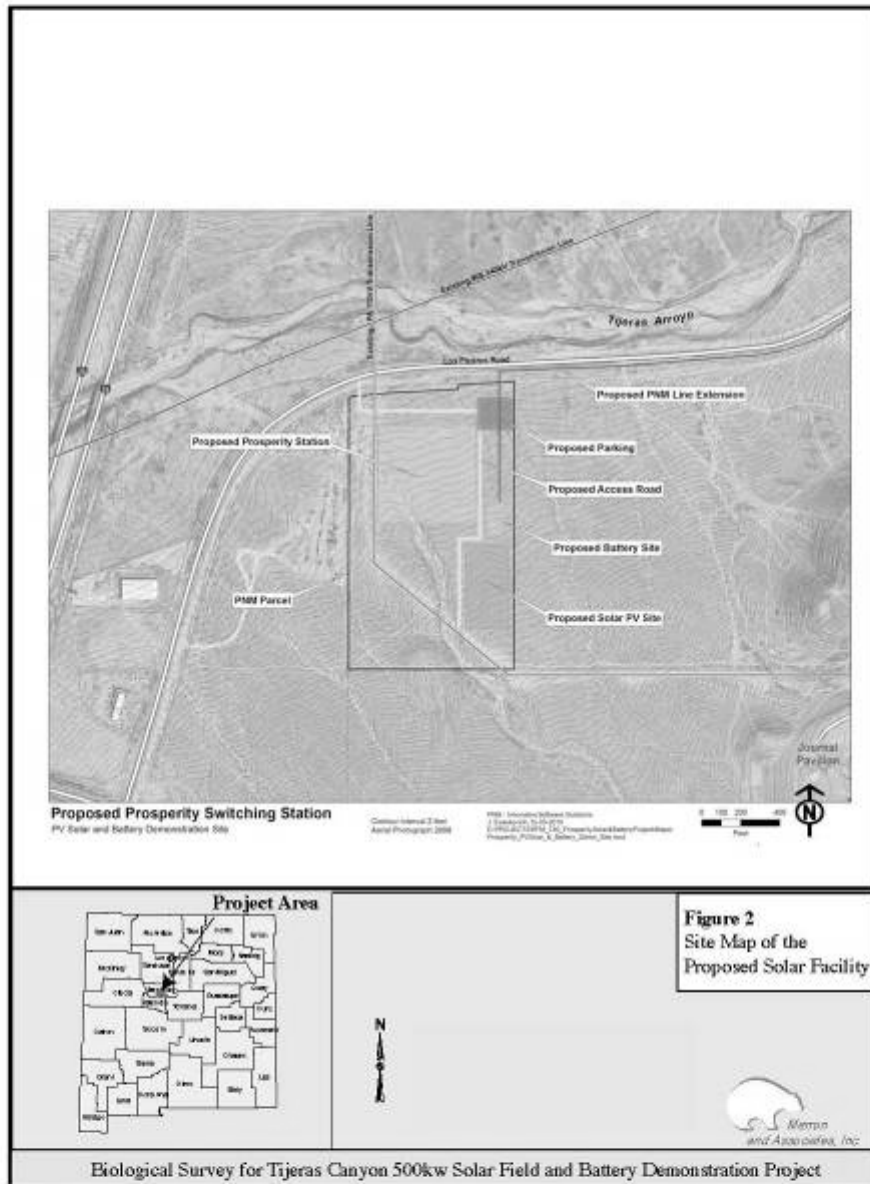
Paul J. Knight  
Marron and Associates

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**ATTACHMENT A**  
**PLANT SPECIES OBSERVED WITHIN THE TIJERAS CANYON 500KW SOLAR FIELD**  
**AND BATTERY DEMONSTRATION PROJECT**

**AGAVACEAE (Agave Family)**

*Yucca glauca* Nutt. (Small soapweed yucca)

**AMARANTHACEAE (Amaranth Family)**

*Tidestromia lanuginosa* (Nutt.) Standl. (Wolly tidestromia)

**ASTERACEAE (Sunflower Family)**

*Ambrosia acanthicarpa* Hook. (Flatspine bursage)

*Artemisia bigelovii* Gray (Bigelow sage)

*Artemisia filifolia* Torr. (Sand sage)

*Baileya multiradiata* Harvey & Gray ex Gray (Desert baileya)

*Chaetopappa ericoides* (Torr.) Nesom (Least daisy)

*Gutierrezia microcephala* (DC.) Gray (Threadleaf snakeweed)

*Gutierrezia sarothrae* (Pursh) Britt. & Rusby (Broom snakeweed)

*Hymenopappus filifolius* Hook. (Finleaf hymenopappus)

*Hymenoxys* sp. (Bitterweed)

*Machaeranthera canescens* (Pursh) Gray (Hoary aster)

*Machaeranthera pinnatifida* (Hook.) Shimmers (Golden aster)

*Townsendia annua* Beaman annual Townsend daisy

**BORAGINACEAE (Borage Family)**

*Cryptantha angustifolia* (Torr.) Greene (Panamint cryptantha)

*Cryptantha minima* Rydb. (Little cryptantha)

**BRASSICACEAE (Mustard Family)**

*Descurainia pinnata* (Walter) Britton (Western tansymustard)

*Descurainia sophia* (L.) Webb ex Prantl (Tansy mustard)

*Dimorphocarpa wislizeni* (Engelm.) Rollins (Spectaclepod)

*Sisymbrium irio* L. (London rocket)

**CACTACEAE (Cactus Family)**

*Opuntia clavata* Engelm. (Club cholla)

*Opuntia phaeacantha* Engelm. (Prickly pear)

**CHENOPODIACEAE (Goosefoot Family)**

*Atriplex canescens* (Pursh) Nutt. (Fourwing saltbush)

*Krascheninnikovia lanata* (Pursh) A.D.J. Meeuse & Smit (Winterfat)

*Salsola tragus* L. (Tumbleweed)

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**EPHEDRACEAE (Jointfir Family)**

*Ephedra torreyana* S. Wats. (Torrey jointfir)

**FABACEAE (Bean Family)**

*Caesalpinia jamesii* (Torr. & Gray) Fisher (James holdback)

*Psoralea scoparius* (Gray) Rydb. (Broom dalea)

**HYDROPHYLLACEAE (Waterleaf Family)**

*Nama dichotomum* (R&P)Choisy (Nama)

*Phacelia crenulata* Torr. ex S. Wats. var. *corrugata* (A. Nels.) Brand (Scorpion weed)

**LOASACEAE (Loasa Family)**

*Mentzelia multiflora* (Nutt.) Gray (Blazing-star)

**NYCTAGINACEAE (Four-o'clock Family)**

*Abronia elliptica* A. Nelson fragrant white sand verbena

**MALVACEAE (Mallow Family)**

*Sphaeralcea incana* Torr. ex Gray (Gray globemallow)

*Sphaeralcea parvifolia* A. Nelson (Smallflower globemallow)

**ONAGRACEAE (Evening Primrose Family)**

*Oenothera pallida* Lindl. ssp. *pallida* (Pale primrose)

**PLANTAGINACEAE**

*Plantago patagonica* Jacq. (Wooly plantain)

**POACEAE (Grass Family)**

*Achnatherum hymenoides* (Roemer & J.A. Schultes) Barkworth (Indian ricegrass)

*Aristida divaricata* Humb. & Bonpl. ex Willd. (Poverty threeawn)

*Aristida purpurea* Nutt. var. *longiseta* (Steud.) Vasey (Red threeawn)

*Bouteloua eriopoda* (Torr.) Torr. (Black grama)

*Dasyochloa pulchella* (Kunth) Willd. ex Rydb. (Fluff grass)

*Sporobolus contractus* A.S. Hitchc. (Spike dropseed)

*Sporobolus cryptandrus* (Torr.) Gray (Sand dropseed)

*Sporobolus flexuosus* (Thurb. ex Vasey) Rydb. mesa dropseed

**POLYGONACEAE (Buckwheat Family)**

*Eriogonum pharnaceoides* Torr. (Wirestem buckwheat)

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**SCROPHULARIACEAE**

*Penstemon ambiguus* Torr. (White-bush beardstongue)

**SOLANACEAE (Potato Family)**

*Lycium torreyi* Gray (Squawthorn)

*Solanum elaeagnifolium* Cav. (Silverleaf nightshade)



**ATTACHMENT B**  
**ANIMAL SPECIES OBSERVED OR INDICATED**  
**WITHIN THE TIJERAS CANYON 500KW SOLAR FIELD AND BATTERY**  
**DEMONSTRATION PROJECT**

**BIRDS**

<b>Common Name</b>	<b>Scientific Name</b>
American crow	<i>Corvus brachyrhynchos</i>
Cassin's sparrow	<i>Aimophila cassinii</i>
Cliff swallow	<i>Hirundo pyrrhonota</i>
Curved-billed thrasher	<i>Toxostoma curvirostre</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Northern mockingbird	<i>Mimus polyglottos</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Scaled quail	<i>Callipepla squamata</i>
Turkey vulture	<i>Cathartes aura</i>
Western kingbird	<i>Tyrannus verticalis</i>

**MAMMALS**

<b>Common Name</b>	<b>Scientific Name</b>
Banner-tailed kangaroo rat	<i>Dipodomys spectabilis</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Botta's Pocket gopher	<i>Thomomys bottae</i>
Coyote	<i>Canis latrans</i>
Desert cottontail	<i>Sylvilagus auduboni</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>

**REPTILES AND AMPHIBIANS**

<b>Common Name</b>	<b>Scientific Name</b>
Common checkered whiptail	<i>Aspidozelis tessellata</i>
Little striped whiptail	<i>Aspidozelis inornata</i>
Side-blotched lizard	<i>Uta stansburiana</i>
Southwestern fence lizard	<i>Sceloporus cowlesi</i>

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**APPENDIX D  
SMART GRID DEMONSTRATIONS PROGRAM  
ENVIRONMENTAL SYNOPSIS**

This appendix contains a copy of the 2009 environmental synopsis for Smart Grid Demonstrations Program Area of Interest 2.

**Environmental Synopsis of**  
**Smart Grid Demonstrations Program**  
**Area of Interest Two – Energy Storage**

Funding Opportunity Announcement  
DE-FOA-0000036

Prepared for

**U.S. Department of Energy**  
**National Energy Technology Laboratory**  
**Morgantown, West Virginia**

**October 2009**



Prepared by  
Jason Associates Corporation  
San Diego, California



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## 1. INTRODUCTION AND BACKGROUND

With funds made available by the *American Recovery and Reinvestment Act of 2009*, the U.S. Department of Energy (DOE or the Department) Office of Electricity Delivery and Energy Reliability issued a competitive Funding Opportunity Announcement (FOA) (DE-FOA-0000036), *Recovery Act – Smart Grid Demonstrations* (DOE 2009). Smart grid projects funded under the FOA would include regionally unique demonstrations to verify smart grid technology viability, quantify smart grid costs and benefits, and validate new smart grid business models, all at a scale that can be readily adapted and replicated around the country. These projects would demonstrate technologies that are widely available for use in the United States.

The goal of the FOA is to demonstrate technologies in regions across the states, districts, and U.S. territories that embody essential and salient characteristics of each region and present a suite of use cases for national implementation and replication. From these use cases, the goal is to collect and provide information necessary for customers, distributors, and generators to change their behavior in a way that reduces system demands and costs, increases energy efficiency, optimally allocates and matches demand and resources to meet that demand, and increases the reliability of the grid. The social benefits of a smart grid are reduced emissions, lower costs, increased reliability, and greater security and flexibility to accommodate new energy technologies, including renewable, intermittent, and distributed sources.

To reap the full benefits of smart grid technologies, advancements in grid-scale energy storage are also needed. Electric grid operators can utilize electricity storage devices to manage the amount of power required to supply customers at times when the need is greatest, which is during peak load. Electricity storage devices can also help make renewable energy resources, whose power output cannot be controlled by grid operators, more manageable. They can also balance microgrids to achieve a good match between generation and load. Storage devices can provide frequency regulation to maintain the balance between the network's load and power generated, increase asset utilization of both renewables and electric systems, defer technology and development investments, and achieve a more reliable power supply for high-tech industrial facilities.

The FOA included two program Areas of Interest (AOIs): (1) Smart Grid and (2) Energy Storage. This environmental synopsis addresses AOI-2; a separate synopsis has been prepared to address AOI-1.

The objective of the FOA under AOI-2 for energy storage is to support demonstration projects for major, utility-scale, energy storage installations. The projects will help to establish costs and benefits, verify technical performance, and validate system reliability and durability at scales that can be readily adapted and replicated across the United States. Energy storage systems include the following technologies: advanced battery systems (including flow batteries), ultra-capacitors, flywheels, and compressed air energy systems. Project areas include wind and photovoltaic integration with the grid, upgrade deferral of transmission and distribution assets,



congestion relief, and system regulation. Projects also include demonstrations of promising utility-scale storage technologies in order to rapidly advance their market readiness in the United States.

As a federal agency, DOE must comply with the *National Environmental Policy Act of 1969* (NEPA) (42 USC 4321 et seq.) by considering potential environmental issues associated with its actions prior to undertaking those actions. The NEPA environmental review of projects evaluated under the Smart Grid Demonstrations FOA will be prepared pursuant to Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500 – 1508), and the Department’s NEPA implementing procedures (10 CFR Part 1021), which provide directions specific to procurement actions that DOE may undertake or fund before completing the NEPA process. Per these regulations, DOE has prepared an environmental critique and this environmental synopsis to support the procurement selection process.

The environmental critique prepared for AOI-2 evaluated nine proposals submitted for the Smart Grid Demonstrations AOI-2. The critique was developed to meet the DOE NEPA implementing procedures and, specifically, to meet the requirements in those procedures for environmental critiques of procurements, financial assistance, and joint ventures [10 CFR 1021.216(f) and (g)].

Only those proposals for which an environmental assessment or environmental impact statement could be required were evaluated. The critique did not address proposals submitted for the FOA that could be categorically excluded in accordance with Subpart D of 10 CFR Part 1021.

The environmental critique provided an evaluation and comparison of potential environmental impacts for each proposal deemed to be within the competitive range. DOE used the critique to evaluate appreciable differences in the potential environmental impacts from those proposals. As delineated in 10 CFR 1021.216(g), the environmental critique focused on environmental issues pertinent to a decision among the proposals and included a brief discussion of the purpose of the procurement and each proposed project, a discussion of the salient characteristics of each project, and a brief comparative evaluation of the environmental impacts of the projects. The critique represents one aspect of the formal process used to select among applicants for funding under the Smart Grid Demonstration AOI-2 FOA. As such, it is a procurement-sensitive document and subject to all associated restrictions.

This document is the environmental synopsis, which is a publicly available document corresponding to the environmental critique. The environmental synopsis documents the evaluation of potential environmental impacts associated with the proposals in the competitive range and does not contain procurement-sensitive information. The specific requirements for an environmental synopsis delineated in 10 CFR 1021.216(h) are as follows:

*(h) DOE shall prepare a publicly available environmental synopsis, based on the environmental critique, to document the consideration given to environmental factors and to record that the relevant environmental consequences of reasonable alternatives have been evaluated in the selection process. The synopsis will not*

*contain business, confidential, trade secret or other information that DOE otherwise would not disclose pursuant to 18 U.S.C. 1905, the confidentiality requirements of the competitive procurement process, 5 U.S.C. 552(b) and 41 U.S.C. 423. To assure compliance with this requirement, the synopsis will not contain data or other information that may in any way reveal the identity of offerors. After a selection has been made, the environmental synopsis shall be filed with EPA, shall be made publicly available, and shall be incorporated in any NEPA document prepared under paragraph (i) of this section.*

To address the above requirements, this environmental synopsis includes: (1) a brief description of background information related to the Smart Grid Demonstration AOI-2, (2) a general description of the proposals received in response to the FOA and deemed to be within the competitive range, (3) a summary of the assessment approach used in the environmental critique to evaluate the potential environmental impacts associated with the proposals, and (4) a summary of the environmental impacts presented in the critique, focusing on potential differences among the proposals. Because of confidentiality concerns, the proposals and environmental impacts are discussed in general terms.

## **2. DESCRIPTION OF APPLICATIONS**

The environmental critique evaluated nine projects under AOI-2. The projects evaluated are large- and small-scale energy storage demonstration projects, most of which include one or more of the following activities:

- Installation of new battery storage systems, generally to be integrated with new or existing photovoltaic or wind energy systems;
- Construction of new compressed air energy storage (CAES) systems connected to the grid and including use of caverns, mines, and aquifers for the air storage component; and
- Construction of flywheel energy storage systems.

The following are brief descriptions of the characteristics of the nine projects evaluated. The aspects of the projects that could result in environmental impacts, and that were considered in the Environmental Critique, are briefly described. All procurement sensitive information has been removed from the descriptions. Most projects include other activities that would result in minor or no impacts on the environment (for example, installing control equipment meters and running electric lines in the immediate area of the energy storage devices); such activities are not described.

### **1. Project 1**

Period: 5.5 years

Location: Texas

This project would involve the construction of one of the largest CAES facilities in the United States, at about 130 megawatts. The project would make use of an existing storage cavern in a salt dome formation nearly 3,000 feet underground. The project would include a 30-acre construction site, discharge of non-contact cooling water to a nearby tributary, and injection of brine removed from the storage cavern.

**2. Project 2**

Period: 4 years  
Location: New York

This project would design, build, test, commission, and operate a utility-scale, 20-megawatt flywheel energy storage frequency regulation plant and provide frequency regulation services to the grid operator. Project objectives include demonstrating to grid operators the technical, cost, and environmental advantages of fast-response flywheel-based frequency regulation; lowering the cost to build a 20-megawatt flywheel energy storage plant; speeding deployment of this technology to other grid operator regions; and stimulating international market demand for flywheel energy storage. The project includes construction of the facility in an industrial park and connecting to an adjacent grid transmission line.

**3. Project 3**

Period: 4 years  
Location: Iowa

Many high-potential wind energy areas of the Midwest are located long distances from significant electrical load. This creates instability and over-capacity for the existing transmission system. In addition, most wind energy is generated during the off-peak hours, which does not match the demands of the electrical system. This project would demonstrate the benefits of a CAES plant to allow transmission systems to efficiently absorb vast amounts of wind energy in areas of high wind penetration and low load. In addition, the applicant would demonstrate and quantify the cost savings and benefits of using a CAES plant to optimize the existing generating assets of the utility systems receiving the wind energy. The applicant proposes to build a 270-megawatt CAES facility. Air would be stored in an underground aquifer.

The project would proceed in two phases:

- Phase 1 would involve air injection tests to demonstrate and prove the capability of the geologic formation to store and release the pressurized air at the desired rates.
- Phase 2 would involve the design, construction, and startup of the 270-megawatt CAES plant on approximately 20 acres of land.

**4. Project 4**

Period: 2 years  
Location: Illinois

The applicant would design, build, test, commission, and operate a 20-megawatt flywheel energy storage frequency regulation plant and provide frequency regulation services to the grid operator. In addition, the applicant would collect critical data needed to measure the achievement of these project objectives and organize and disseminate that data to DOE, other grid operators, and the public in appropriately useful formats. The project site would be about 3.5 acres and involve the use of 200 high-energy flywheels.

**5. Project 5**

Period: 3 years  
Location: Ohio

The applicant would install a compressed air power generating facility, which would be capable of 268 megawatts of power generation and would be located at a limestone mine. The project would include two power generation units designed specifically for the CAES application. The facility would be designed to operate on natural gas only. The project is already permitted for up to 800 Megawatts of power generation. Construction on the 92-acre site, which is previously disturbed and zoned for heavy industry, would include the power generation building, a control building, and a cooling tower.

**6. Project 6**

Period: 5 years  
Location: California

The applicant would install a compressed air power generating facility using a saline porous rock formation as the storage reservoir. The project would take a phased approach to build and validate the design, performance, and reliability of an advanced underground CAES plant (300 megawatts with 10 hours of storage).

**7. Project 7**

Period: 4 years  
Location: Hawaii

The project consists of the construction of a large battery enclosure and a substation, with a combined footprint of less than an acre. These facilities would be adjacent to existing wind energy facilities.

### **8. Project 8**

Period: 5 years

Location: New York

The proposed project would include final design, layout, and construction of a 130-megawatt electric-peaking CAES plant. The plant would use electric-drive compressors during times of low electric demand to compress air into an existing salt cavern for subsequent use to generate electricity during times of high demand. A new 1.5-mile long electric transmission line and substation would be constructed to tie the new facility into the existing electric grid. The project site would be a leased 10-acre section of a much larger parcel. The tallest structure (stack) would be about 80 feet, and a building about 60 feet tall and 130 feet long would be constructed to house large equipment. New wells would likely be drilled into the cavern. Pumps and a water line (approximately 1,600 feet long) from a nearby recreational lake would be installed to provide access to fresh water for cooling towers.

### **9. Project 9**

Period: 4 years

Location: New Mexico

This project would combine a 2.8-megawatt hour battery system with an existing 500-kilowatt solar photovoltaic installation. The goal is to employ the battery, along with a control system, to turn solar photovoltaic into a reliable, dispatchable, distributed generation resource. Data collection and analysis based on this design would produce information for a range of possible applications. The project would also yield computer-based modeling tools that would simulate the behavior of distribution feeders under varying loads, with and without distributed generation and storage attached. Construction would be on 5 acres within a currently undeveloped 27-acre site, and would include access roads, a pad for the battery system, and a 1,000-foot line to existing transmission lines.

## **3. ASSESSMENT APPROACH**

Each of the applicants that provided a proposal in response to the Smart Grid Demonstrations FOA was required to submit an environmental questionnaire. The questionnaires included detailed information on the project including the following:

- Project Summary and objectives
- Work locations
- Materials used and produced (e.g., water, electricity, wastewater, air emissions)
- Proposed alternatives
- Land use changes

- Proximity to local, state, or national parks, forests, monuments, scenic waterways, wilderness, recreation facilities, or Tribal lands
- Potential impacts of construction activities
- Potential impacts to surface waters, floodplains, or wetlands
- Potential impacts to any vegetation and wildlife resources
- Changes that could result in socioeconomic or infrastructure conditions
- Potential impacts to historic or cultural resources
- Attainment status for the air quality conditions for the immediate project area
- Potential air emissions from the proposed project
- Potential amounts of solid and hazardous wastes produced
- Unique health and safety factors associated with the project
- Any required permitting or other regulatory compliance activities
- Potential for public controversy

For each project considered in the environmental critique, the potential direct and indirect effects, short-term and long-term effects, and unavoidable adverse effects were identified for 20 resource areas. These resource areas are included as the first 20 entries in Table 1 in Section 4. The critique also includes a summary of project activities, mitigation measures proposed by the applicant, areas where important environmental information is incomplete and unavailable, unresolved environmental issues, and practicable mitigation measures. Also included is a list of federal, tribal, state, and local government permits, licenses, and approvals identified by the applicants or known to be required for each project.

#### **4. SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS**

This section provides a summary of potential impacts for each project. Table 1 identifies the resource areas that could be adversely or beneficially impacted for each of the nine projects. For each project, the potential direct and indirect, short-term and long-term, and unavoidable impacts were identified and classified into one of the following four color-coded categories:

- No impacts to a resource area are expected – blank
- Potential for minor adverse or beneficial impacts or unknown impacts of possible minor concern – black text or dot, no shading
- Potential for moderate adverse impacts or unknown impacts of possible moderate concern – light shading
- Potential for major adverse impacts or unknown impacts of possible major concern – darker shading

As summarized in Table 1, many of the projects have the potential to affect multiple aspects of the environment. Because of the nature of many of these projects (for example, construction of

new facilities, often with power-generating, or conversion, capabilities), many of the projects would have minor or moderate impacts on a range of environmental resource areas including aesthetics, air quality, human health and safety, land use, noise, waste and materials, transportation, and utilities. Some of the projects would also have minor or moderate impacts on cultural, biological, groundwater, and surface water resources. The geologic-based CAES are also identified as having the potential for moderate impacts on geology because of the unknowns associated with how the geologic features would respond to the repeated pressurization and release cycles. Most or all of the projects would have minor beneficial impacts on socioeconomic conditions (by increasing employment and the monetary infusion into the community) and utility operations (by improving the efficiency of the transmission system).

Many of the projects highlighted in Table 1 as having the potential for moderate adverse impacts are actually characterized in the environmental critique as having minor-to-moderate impacts. This characterization is often associated with unknowns with respect to some project quantity or the existing characteristics of the project site. The classification of these impacts may eventually be downgraded as the design of projects mature and more information becomes available.

Only one project was identified with the potential to have major adverse impacts. This was due to the projected amount of air emissions that would be involved, likely requiring a Prevention of Significant Deterioration permit for the project.

**Table 1. Potential Impacts of Smart Grid Demonstration Projects Rollup – Area of Interest 2**

Resource Areas	1	2	3	4	5	6	7	8	9
Aesthetics	•	•	•	•	•	•	•	•	•
Air Quality	•	•	•	•	•	•	•	•	•
Biological Resources		•	•			•	•		•
Climate									
Community Services									
Cultural Resources			•					•	•
Environmental Justice									
Floodplains									
Geology	•				•	•		•	
Groundwater	•		•			•		•	
Human Health and Safety	•	•	•	•	•	•	•	•	•
Land use	•	•	•	•	•	•	•	•	•
Noise	•	•	•	•	•	•	•	•	•
Wastes & Materials		•	•	•	•			•	•
Soils		•	•	•		•	•	•	•
Socioeconomics	•	•	•	•	•	•	•	•	•
Surface Water	•		•			•	•	•	•
Transportation/Traffic	•	•	•	•	•	•		•	•
Utilities	•	•	•	•	•	•	•	•	
Wetlands	•							•	
Public Controversy	•		•			•		•	•
Permits	•	•	•	•	•	•	•	•	•
Mitigation	•	•		•	•	•		•	•

- (Blank) No impacts expected.
- Potential to be minor adverse or beneficial impacts or there are unknowns of possible minor concern.
- Potential to be moderate adverse impacts or there are unknowns of possible moderate concerns.
- Potential to be major adverse impacts or there are unknowns of possible major concerns.

## 5. REFERENCES

DOE 2009 U.S. Department of Energy, National Energy Technology Laboratory, *Recovery Act – Smart Grid Demonstrations, Funding Opportunity Number: DE-FOA-0000036*, June 25, 2009.