PETITION SUBMITTED TO SECRETARY SALLY JEWELL
UNITED STATES DEPARTMENT OF INTERIOR AND
THE UNITED STATES BUREAU OF LAND MANAGEMENT

PETITION ASKING SECRETARY JEWELL AND THE BUREAU OF LAND MANAGEMENT TO DESIGNATE THE GREATER CHACO LANDSCAPE AS AN AREA OF CRITICAL ENVIRONMENTAL CONCERN AND TO WITHDRAW ALL FEDERAL LANDS CURRENTLY OPEN TO OIL AND GAS LEASING THAT ARE WITHIN THE BOUNDARY OF THE PROPOSED AREA OF CRITICAL ENVIRONMENTAL CONCERN

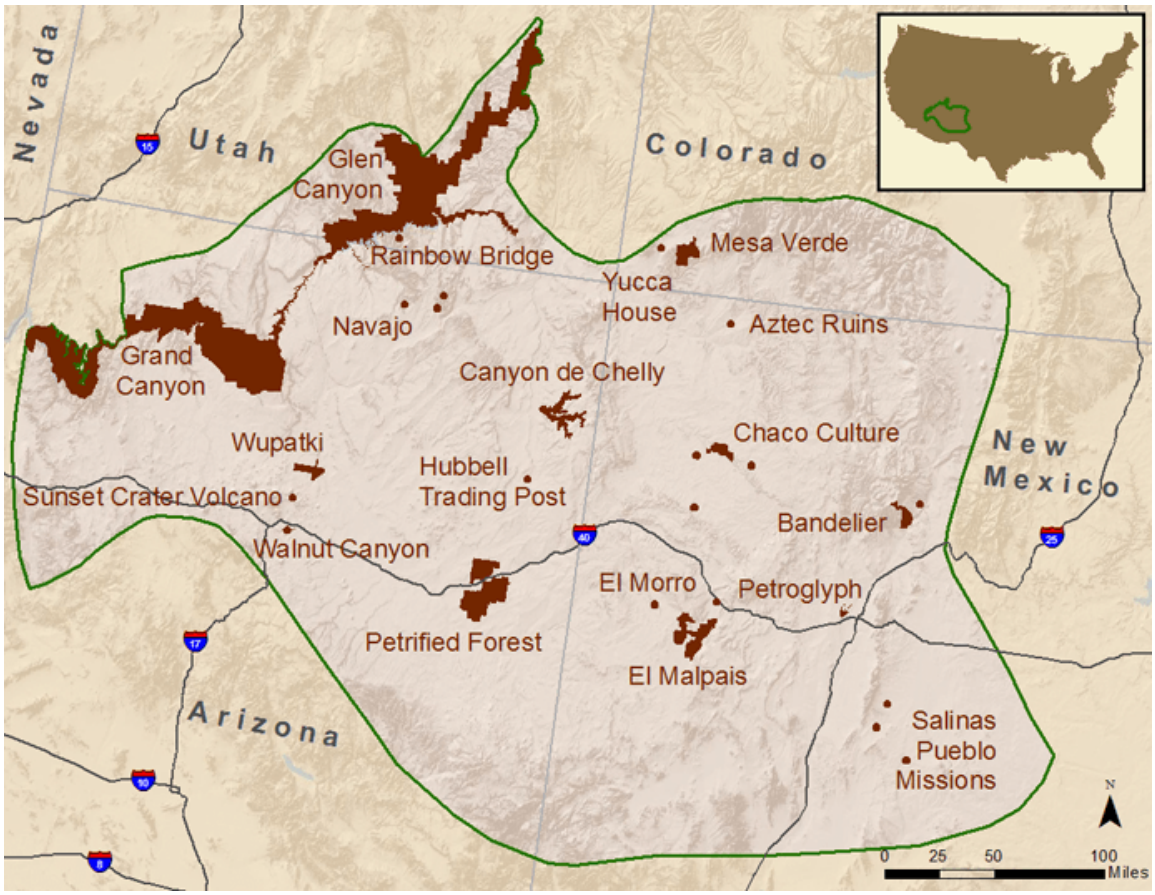
Petitioners:

Chaco Alliance
San Juan Citizens Alliance
WildEarth Guardians
Society for American Archaeology
New Mexico Archeological Council

September 4, 2013

I. INTRODUCTION

The Chaco Alliance, San Juan Citizens Alliance, WildEarth Guardians, the Society for American Archaeology, and the New Mexico Archeological Council file this Petition pursuant to section 553(e) of the Administrative Procedures Act, 5 U.S.C. § 553(e) ("Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.") and the Department of Interior rulemaking regulations at 43 C.F.R. §14.2. We formally petition Secretary Jewell and the U.S. Bureau of Land Management ("BLM") to designate the Greater Chaco Landscape (as defined herein) as an Area of Critical Environmental Concern ("ACEC") pursuant to 43 C.F.R. § 1610.7-2. This designation is necessary to protect the significant cultural values associated with both Chaco Culture National Historical Park and the manifestations of Chacoan Culture found on the surrounding landscape from being adversely impacted by oil and gas development. As part of BLM's management of the Greater Chaco ACEC, we are also petitioning Secretary Jewell and BLM to amend the Farmington Resource Management Plan ("RMP") pursuant to 43 C.F.R. § 1610.5-5 to withdraw from leasing all lands currently open to Federal leasing within the proposed ACEC boundaries. This management practice is necessary to protect the cultural, aesthetic, and recreational values of the Greater Chaco Landscape ACEC.



Location of Chaco Culture National Historical Park in relation to other National Parks in the Four Corners area of the Southwestern United States. (Available at https://science.nature.nps.gov/im/units/scpn/parks/chcu.cfm/)

II. BACKGROUND

A. The Greater Chaco Landscape.

The proposed Greater Chaco Landscape ACEC is part of a much larger cultural landscape that includes some 67,000 square miles, primarily in northwestern New Mexico. Exhibit 1.[1] Chaco Culture National Historical Park ("CCNHP" or "the Park"), located within the geographic area that includes lands and federal minerals under the jurisdiction of BLM's Farmington Field Office ("FFO"), is the heart of the Greater Chaco Landscape. Figures 1 (showing BLM surface ownership), 2 (showing BLM mineral ownership). The Park is listed on the National Register of Historic Places and is designated a World Heritage Site. In addition to the national park, the Greater Chaco Landscape includes most of the Chaco Culture World Heritage Site. It also encompasses several of the satellite villages—or Chacoan Great House Communities—and other resources affiliated with Chaco Canyon that have been formally designated by either Congress or BLM. Finally, the Greater Chaco Landscape includes the Great North Road, which once linked Chaco Canyon with a settlement approximately 55 miles to the north known today as Aztec Ruin. Recently, the Solstice Project used aerial laser scanning to identify several previously undocumented segments of the Great North Road. Exhibit 2.[2]

B. The Farmington Field Office RMP.

In March 2003, the Farmington Field Office of the BLM issued a revised RMP for northwest New Mexico's San Juan Basin and a Final Environmental Impact Statement ("FEIS") related to that plan. In December 2003, BLM issued its Record of Decision ("ROD") adopting the RMP and FEIS. BLM amended the RMP in 2003 primarily to update the management constraints on oil and gas leasing and development. The Farmington RMP is a general resource management plan for 1.4 million acres of BLM administered public lands and 3 million acres of subsurface minerals. In all, the planning area encompasses over 8 million acres of mixed-ownership land. ROD at 1 (Exhibit 3). The planning area encompasses the New Mexico portion of the San Juan Basin, which is one of the largest natural gas fields in the nation and has been under development for more than 50 years. *Id*. It supports approximately 18,000 active oil and gas wells and there are more than 2,400 existing oil and gas leases in the planning area. *Id*. Virtually all of the area with high potential for oil and gas development has already been leased. *Id*. As discussed in Section V.A below, the 2003 RMP did not contemplate full-scale development of the Mancos shale formation and the FEIS for the RMP did not analyze the environmental impacts associated with the development of this unconventional formation.

The RMP allowed for a total of 2,597,193 acres of BLM-managed lands to remain open for oil and gas leasing and development under Standard Terms and Conditions. Approximately 79,000 acres, primarily contained within Specially Designated Areas, were closed to new

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[1] UNESCO, Chaco Culture Advisory Body Evaluation at 1 (1987), available at http://whc.unesco.org/archive/advisory_body_evaluation/353.pdf. All exhibits are included on a CD accompanying this Petition. For those exhibits available online, Petitioners also provide the web address.

[2] Solstice Project, LiDAR Study Reveals Chaco Canyon's Great North Road, available at http://www.solsticeproject.org/AALiDARarticle.pdf.

leasing. The majority of lands closed to new leasing remain subject to existing leases, thus a discretionary closure would apply only to new leases or if existing leases were allowed to expire.

The RMP includes 79 cultural resource ACECs to protect "relevant and important" cultural values. ROD at 7 (Exhibit 3). Some of these ACECs are located within the proposed Greater Chaco Landscape ACEC boundary, and would receive greater protection as part of the larger ACEC proposed herein.

C. Areas of Critical Environmental Concern.

An Area of Critical Environmental Concern ("ACEC") is a designation that highlights areas needing special management to protect and prevent irreparable damage to important cultural, historic and scenic values. To be designated as an ACEC, the proposed area must meet two criteria: relevance and importance. "Relevance" refers to the presence of "a significant historic, cultural, or scenic value[.]" 43 C.F.R. § 1610.7-2(a)(1). "Importance" requires that the historic, cultural, or scenic value possess "qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern." *Id*. at § 1610.7-2(a)(2). The State Director formally designates ACECs through the resource management planning process. *Id*. at § 1610.7-2. Here, the State Director may use the RMP amendment process to designate the Greater Chaco Landscape as an ACEC. *Id*. at § 1610.7-2(b). The plan amendment "shall include the general management practices and uses, including mitigation measures, identified to protect the ACEC." *Id*.

D. The RMP Amendment Process.

BLM is required to amend the RMP when one of the following circumstances is present:

> the need to consider monitoring and evaluation findings, new data, new or revised policy, a change in circumstances or a proposed action that may result in a change in the scope of resource uses or a change in the terms, conditions and decisions of the approved plan.

43 C.F.R. § 1610.5-5. BLM must do either an EA or EIS for the proposed change to the RMP. *Id*. When BLM is considering an amendment in response to a specific proposal, such as this Petition, the analysis required for the Petition and for the amendment may occur simultaneously. *Id.*

III. REQUEST FOR BLM TO DESIGNATE THE GREATER CHACO LANDSCAPE AS AN ACEC

We hereby petition Secretary Jewell and BLM to designate the Greater Chaco Landscape, as defined herein, as an ACEC. The proposed boundary for the Greater Chaco Landscape ACEC is shown on Figure 3. The proposed ACEC boundary in relation to Federal minerals is shown in Figure 2. A table listing the boundary coordinates is included as Exhibit 4; *see also* Figure 4 (showing boundary coordinates in relation to ACEC boundary). This boundary was created based on several factors including: (1) the potential visual impact to the Park from oil and gas development of Federal minerals within 20 miles of the Park; (2) locations of active oil and gas

wells, and (3) locations of active oil and gas leases. *See* Figure 5 (showing Federal mineral parcels visible from the Park) and Figure 6 (showing locations of active oil and gas wells and BLM lands open to oil and gas leasing).

Because BLM has authority to designate management practices to protect the ACEC, 43 C.F.R. § 1610.7-2(b), we also petition BLM to implement two management practices with respect to leasing of Federal oil and gas minerals: (1) for those lands available for leasing but not yet leased, that BLM withdraw from leasing all lands currently open to Federal leasing within the proposed ACEC boundaries, and (2) for those Federal lands already leased but not in production, that BLM withdraw these lands from leasing once the lease period expires due to lack of production.

Petitioners are aware that the proposed ACEC boundary includes lands not under BLM's jurisdiction and that any management practices BLM implements for the ACEC will only apply to lands and minerals within BLM's jurisdiction. Of the 1.1 million acres included in the proposed ACEC, Federal minerals comprise 488,359 acres, or 43 percent, of the ACEC area. Therefore, withdrawal of close to half a million acres from energy development would provide an adequate protective zone not only for the Park but for the manifestation of Chacoan Culture on the surrounding landscape.

IV. THE GREATER CHACO LANDSCAPE MEETS THE CRITERIA FOR ACEC DESIGNATION

The Greater Chaco Landscape ACEC, as defined herein, includes Chaco Culture National Historical Park and all Chaco Outliers, ACECs, and other archaeological sites and features dating to the Pueblo II-III period[3] located within the proposed Greater Chaco ACEC boundary as shown on Figure 3.[4] The FEIS for the Farmington RMP includes a discussion of the timing, growth and development, and archaeological signatures of the "Chaco phenomenon" and notes that approximately 20 percent of the 54,000 sites in the planning area date to the Pueblo II-III periods. FEIS at 3-71 to 3-76 (Exhibit 5).

The proposed ACEC meets the twin criteria of "relevance" and "importance" required for ACEC designation. "Relevance" refers to the presence of "a significant historic, cultural, or scenic value[.]" 43 C.F.R. § 1610.7-2(a)(1). "Importance" requires that the historic, cultural, or scenic value possess "qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern." *Id*. at § 1610.7-2(a)(2). There is abundant evidence that the Greater Chaco Landscape possesses all of these values, that they are significant, and that these values extend well beyond the realm of local concern. Beginning with the Park, which is the starting point in understanding the "Chaco phenomenon," Congress recognized "the national significance of the Chacoan sites" and the need to protect these "unique

[3] The FEIS for the Farmington RMP defines the Pueblo II period as spanning A.D. 900-1050, and the Pueblo III period as spanning A.D. 1050-1300.

[4] A list of existing ACECs dating to the Pueblo II and Pueblo III periods is included in FEIS for the Farmington RMP at 3-75 and 3-76 (Exhibit 5). Because these locations, along with locations of other non-ACEC Pueblo II-III sites within the proposed Greater Chaco ACEC boundary are not available to the general public, Petitioners could not plot these sites on any of the maps included with this Petition.

archaeological resources" when it created the Park in 1980. 16 U.S.C. § 410ii. In addition to its national significance, the Park also has global significance. In 1987, ICOMOS designated the Park and several Chacoan sites outside the Park boundaries as a World Heritage Site ("WHS"). The WHS designation is not limited to the Park. The designation also includes four Chacoan Outliers (Pierre's Site, Halfway House, Twin Angels, and Aztec Pueblo) located along the North Road and two Outliers (Kin Nizhoni and Casamero) along the South Road.[5] Exhibit 1. To be included on the World Heritage List, sites must be of outstanding universal value and meet at least one out of ten selection criteria. The Park and the Outliers were added to the WHS list based on criterion III of the selection criteria, meaning the Park and the Outliers "bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared."[6]

The same legislation that created the Park also designated 33 sites outside the Park boundaries as "Chaco Cultural Archaeological Protection Sites" that were to be jointly managed by the National Park Service ("NPS"), Bureau of Land Management ("BLM"), Bureau of Indian Affairs ("BIA"), and the Governor of New Mexico for preservation and interpretation purposes. 16 U.S.C. § 410ii-1(b). Of the 33 sites on the list, 13 of them are on BLM lands and have been designated as ACECs. FEIS at 3-75, 3-76 (Exhibit 5). BLM characterizes these 13 sites as "outstanding examples of cultural resources from [the Pueblo II and Pueblo III] period[s]." *Id*.

Recently, the International Dark-Sky Association ("IDA") designated the Chaco Culture National Historical Park as the newest "Dark Sky Park" for "its commitment to preserving its near-pristine night skies." Exhibit 7. IDA has conferred this designation on only eleven other parks scattered around the world. *Id*.

The National Park Service has identified a variety of fundamental values associated with the Park that also apply to the Outliers and other cultural sites within the Greater Chaco Landscape, including:

- The physical surroundings that enfold the visitor, conveying both the vast immensity of the San Juan Basin and the dense core of Chacoan culture.
- Solitude, natural sounds, sandstone cliffs, natural events, landscape, and remote sites that are integral for visitor understanding of Chaco Canyon.
- The ability to view the seasonal patterns in the dark night sky including the stars, moon, and other celestial bodies – and the sun in the daytime sky.
- Unpolluted air is an important aspect of the biotic landscape.

NPS, Chaco Culture National Historical Park: Foundation for Planning and Management (Sept. 2007) (Exhibit 8). All of these values possess the requisite qualities to meet the "importance" criterion for ACEC designation. As discussed below, oil and gas development will destroy these values.

[5] With the exception of Aztec Pueblo, the other five Outliers that are part of the WHS designation are located on BLM land and managed by BLM.

[6] *See id.* and the UNESCO selection criteria. Exhibit 6. Available at http://whc.unesco.org/en/criteria/.

V. NEED FOR THE GREATER CHACO LANDSCAPE ACEC DESIGNATION

The requested ACEC designation is necessary given the increased interest in energy development within the Greater Chaco Landscape over the last five years. *See* BLM Master Leasing Plan Assessment ("MLP Assessment") at 2-5 (Exhibit 9). In 2009, the oil and gas industry nominated eight parcels for lease that were all located within five miles of the Park. One of the parcels included a segment of the Great North Road ACEC. BLM removed these parcels from the sale following a protest by Hopi; however, these parcels remain open to leasing under the RMP. In 2010, the oil and gas industry nominated several parcels for lease that were within the Greater Chaco Landscape. BLM deferred leasing these parcels pending the outcome of tribal consultation. Yet all of these parcels remain open to leasing under the RMP. In 2012, the oil and gas industry nominated 53 parcels for lease as part of the April 2013 lease sale. BLM deferred 39 of the parcels pending the outcome of tribal consultation. April 2013 Leasing EA at 8 (Exhibit 10). BLM subsequently withdrew the parcels from the October 2013 lease sale, but indicated its intent to offer these parcels in the January 2014 lease sale. Many of these withdrawn parcels are in close proximity to the Park and located within the Greater Chaco Landscape. Figure 7 (showing parcels nominated for the January 2014 lease sale). On September 3, 2013 BLM issued an EA for the January 2014 lease sale in which the agency included two alternatives: a "proposed alternative" deferring all but seven[7] of the 38 leases previously nominated and a "preferred alternative" deferring all but four of the 38 leases. January 2014 Leasing EA at §§ 2.2, 2.3 (Exhibit 29). All but three of these leases were deferred because "[a]n inventory for lands with wilderness characteristics has not been completed on a number of the nominated parcels." *Id*. at § 2.1. BLM notes that these leases will be deferred until the agency completes an inventory of wilderness characteristics for the parcels. *Id*.

Although BLM is proposing to withdraw several leases in close proximity to the Park from the January 2014 lease sale, they all remain open for leasing under the RMP and may be leased at some future time. Continued deferral of the parcels does not impart long-term protection to the proposed ACEC.

A. BLM has not Analyzed the Effects of Full-Scale Development of Mancos Shale on the Greater Chaco Landscape.

Roughly 24 percent (38,636 acres) of the federal mineral estate within ten miles of Chaco Culture National Historical Park has been leased for oil and gas. MLP Assessment at 2-5 (Exhibit 9). The remaining 76 percent of the federal mineral estate within 10 miles of the Park remains open for leasing under the RMP. *Id*. BLM acknowledges that "there has been an increased interest in leasing lands south of the more heavily leased and developed area" in recent years and that "[o]il and gas potential has been confirmed in the area." *Id*. Moreover, new energy development in the area will focus on the Mancos shale formation using hydraulic fracturing technology. EA at 23 (Exhibit 10). The 2003 Farmington RMP and FEIS, including the RMP Reasonably Foreseeable Development Scenario ("RFDS"), did not contemplate commercially viable development of the Mancos shale, did not consider the utilization of

[7] Three of the parcels included in the proposed alternative—parcels 163, 165, 166—are located less than one mile from the Park's northeast boundary. *See* Figure 8. The four parcels in the preferred alternative are located 10-20 miles from the Park but still within the proposed boundary for the Greater Chaco ACEC. *See* Figure 7.

horizontal drilling techniques, and did not specifically consider the impacts of hydraulic fracturing. Specifically, the RMP and EIS did not consider the specific environmental impacts of Mancos shale development, and in particular the landscape-level impacts to the unique cultural and archaeological values of the Park and its surrounding landscape.

Although the RFDS identified a geographic area that includes the proposed Greater Chaco Landscape ACEC as having the potential for Mancos shale gas and oil, the RFDS also stated that:

> [M]ost existing Mancos Shale and Gallup Sandstone reservoirs are approaching depletion and are marginally economic. Most are not currently considered candidates for increased density development or further enhanced oil recovery programs.

RFDS at 5.24 (Exhibit 11). With respect to horizontal drilling technology, the RFDS stated that "[h]orizontal drilling is possible but not currently applied in the San Juan Basin due to poor cost to benefit ratio" and that horizontal drilling in shale formations would not even be a viable production technique "within the 20 year time frame anticipated by this RFD." *Id*. at 8.3. Furthermore, the FEIS for the 2003 RMP showed the planning area that includes the proposed Greater Chaco Landscape ACEC as being outside the "high development area" for oil and gas. FEIS at 2-32 (Exhibit 5). ***Because BLM has never analyzed the impacts of full-scale development of Mancos shale, this proposed development is the type of new circumstance that triggers the need for an RMP amendment***. 43 C.F.R. § 1610.5-5. BLM has expressed an intention to do an RMP amendment for full-scale Mancos shale development in the FFO, and because this Petition is necessitated by the potential for full-scale Mancos shale development in close proximity to the Park and within the proposed Greater Chaco ACEC, BLM should analyze this Petition as part of any RMP amendment for Mancos shale.[8]

B. Mancos Shale Development Could Have Significant Air, Noise, and Seismic Effects on the Greater Chaco Landscape.

Hydraulic fracturing (or "fracking") is a common technique used to stimulate the production of oil and natural gas from shale formations such as Mancos shale. Typically, fluids are injected into a formation at high pressures, the formation fractures, and the oil or gas flows more freely out of the formation. Because fracking is a relatively new technology, its environmental impacts are not yet fully understood and have often been underestimated

1. Air and Light Pollution

Ozone is a main component of smog. With the advent of fracking, places once known for their wild, pristine vistas – such as northeastern Utah, western Colorado, North Dakota, and Wyoming – are now seeing smog levels higher than Los Angeles or New York City. Exhibit 12, 13.[9,10] In Wyoming, the air pollution is visible as a layer of brown smog above the horizon, and

[8] *See* 43 C.F.R. § 1610.5-5 (allowing BLM to combine its analysis of a Petition with its analysis of an RMP amendment as part of the same NEPA process.

[9] Mead Gruver, *Wyoming Air Pollution Worse than Los Angeles due to Gas Drilling*, The Huffington Post (March 8, 2011). http://www.huffingtonpost.com/2011/03/08/wyoming-air-pollution-gas-drilling_n_833027.html.

the details of nearby mountains do not appear as sharp as they were prior to energy development. One resident compared the effect to "not wearing your glasses when you ought to be." Exhibit 12. Compounding on the smoggy haze, gas flares from fracking create light pollution which interferes with the clarity of night skies. *Id*. So bright is the flaring in North Dakota that locals call it "Kuwait on the Prairie," and regions of the state which appeared dark six years ago are now literally glowing from space. Exhibit 14.[11]

With potential development of the Mancos shale formation so close to the Park and within the boundary of the Greater Chaco Landscape, these air quality and visual impacts are inevitable and will significantly impact the Park's solstice and equinox sunrise events, as well as the Chaco Night Sky Program which is active throughout the year to educate visitors about both ancient and modern aspects of our nation's astronomical heritage. Exhibit 15 (describing the Park's Night Sky Program). On August 28, 2013, the International Dark-Sky Association designated the Park as a "Dark-Sky Park" because of the Park's commitment to preserving its night skies through such efforts as "adopt[ing] a set of strict lighting guidelines that include the use of dark-sky friendly lighting now and in the future, ensuring that it will do its part to keep the nighttime environment natural and unspoiled for generations to come." Exhibit 7. Air and light pollution created by nearby fracking operations could significantly impair these valuable cultural programs by making it much more difficult to observe the night sky and possibly distorting or diminishing the sunrise alignments. An example of current impacts to the night sky from existing well pads is shown in the photograph below.

Lights from a drilling rig in the San Juan Basin. (Photo courtesy of Jeremy Nichols)

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[10] National Parks Conservation Association, *National Parks and Hydraulic Fracturing*, 2013. http://www.npca.org/assets/pdf/Fracking_Report.pdf

[11] Melissa C. Lott, *A New Light in the Sky - "Kuwait on the Prairie,"* Scientific American (January 17, 2013). http://blogs.scientificamerican.com/plugged-in/2013/01/17/a-new-light-in-the-sky-kuwait-on-the-prairie/

The Park's daytime activities also may be impacted by fracking. The Park offers both valley and canyon rim hiking trails, allowing visitors to take in breathtaking views of the ruins and the sprawling desert landscape. Exhibit 16 (describing "panoramic views" as a feature of the Publio Alto Trail). Clear visibility is an obvious component of appreciating these vistas. The smog and other air pollution created by fracking could shroud the Park and surrounding landscape in a noticeable haze and obstruct the natural view with industrial drill rigs and flaring. Such effects would significantly impair the enjoyment of the Park by those who seek out its pristine beauty.

View of Chaco Canyon and surrounding landscape. (Photo courtesy of Dave Barz)

But aesthetic impairment is not the only threat to the Park and the surrounding landscape. In addition to elevated ozone levels, the U.S. Environmental Protection Agency has determined that the process of hydraulic fracturing also emits air toxics such as benzene, toluene, ethylbenzene, and xylene, all of which "can result in serious health impacts such as cancer, respiratory disease, aggravation of respiratory illnesses, and premature death." Exhibit 17.[12] A study by the Colorado School of Public Health showed that air pollution caused by fracking may contribute to acute and chronic health problems for those living near drilling sites. Exhibit 18.[13]

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[12] United States Environmental Protection Agency, *EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector*, Report No. 13-P-0161 (February 20, 2013). http://www.epa.gov/oig/reports/2013/20130220-13-P-0161.pdf

[13] David Kelly, *Study Shows Air Emissions Near Fracking Sites May Pose Health Risk*, University of Colorado, March 19, 2012. http://www.ucdenver.edu/about/newsroom/newsreleases/Pages/health-impacts-of-fracking-emissions.aspx

Another study, published in the peer-reviewed journal Human and Ecological Risk Assessment, found more than 50 non-methane hydrocarbons near gas wells in Colorado, including 35 which affect the brain and nervous system. Exhibits 19, 20.[14] This latter study also warned that federal worker safety standards are typically designed for healthy adult males exposed to the chemicals for 40 hours a week, and that the risks are likely different for pregnant women, children, and the elderly, and for longer exposures. While risks are greatest near the wells, Exhibit 18, pollutants also travel through air currents and could affect communities and activities within a radius of many miles.

Western Wyoming is experiencing these air pollution effects. Exhibit 12. Residents who live near gas fields get watery eyes, shortness of breath, and bloody noses because of heightened ozone levels from fracking. Despite the state's rugged outdoor culture, the effects have become so hard to ignore that the Wyoming Department of Environmental Quality recommended that the elderly, children, and people with respiratory conditions should avoid strenuous or extended outdoor activity. One resident recounts how walks and snowshoe trips have become difficult because "you feel a tightness in your chest. You seem to be less able to hold in air." *Id.* People living near fracking wells have also complained of "bad odors" and "funny smells" which could be linked to air or hazardous pollutants. Exhibit 13.

Since BLM is contemplating authorizing leases for Mancos shale development within a 10-mile radius of the Park, and as close as within 800 feet of the Park's northeast boundary (*see* Figures 7, 8), visitors to the Park would be placed right in the midst of full-scale energy development where the air pollution health risks are highest. The Park's trails and wild setting attract avid hikers and campers from around the country, and the offered activities range from easy to strenuous. Air pollution from surrounding oil and gas fields could shroud the Park and surrounding landscape in smog, making it more difficult for visitors to enjoy the physical activities at the Park. This level of air pollution may also aggravate existing respiratory conditions of those hoping to get away from big city smog. Campers, who often stay for several days, and Park staff, who may live within the canyon year-round, would be subject to long-term exposure to high levels of air pollution and even greater health risks. For a park geared towards enjoyment of the outdoors, the cumulative effects of Mancos shale development may result in significant health, aesthetic, and recreational impacts.

The potential for this range of significant impacts from oil and gas development is underscored by the fact that a recent report by the EPA admitted that the agency "did not anticipate the tremendous growth of the [oil and gas] sector" and needs "to gain a better understanding of emissions and potential risks from the production of oil and gas." Exhibit 17. The agency also noted that it "has limited directly-measured air emissions data for air toxics and criteria pollutants for several important oil and gas production processes and sources." In other words, there is not enough data to make truly informed decisions about oil and gas development. More research needs to be done on both the emissions and their health effects, and other agencies should take heed of this warning before issuing leases that may irreversibly scar the landscape.

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[14] *An Exploratory Study of Air Quality near Natural Gas Operations*, November 8, 2012. http://tedx.org/files/HERA12-137NGAirQualityManuscriptforwebwithfigures.pdf ; Lisa Song, *Hazardous Air Pollutants Detected Near Fracking Sites*, Bloomberg (December 3, 2012). http://www.bloomberg.com/news/2012-12-03/hazardous-air-pollutants-detected-near-fracking-sites.html

2. Noise Pollution

It is undisputed that natural gas development is a very loud process. The noise pollution includes drilling, blasts of air compressors pumping fracturing fluids into the ground, flaring of uneconomical gas accompanied by sounds comparable to a jet engine, heavy construction necessary for setting up and maintaining well sites, as well as the noise of trucks moving water and equipment to and from the drill pads. Exhibit 13. People who live near fracking operations say that it sounds as if a train is running through their neighborhood, giving them headaches, Exhibit 21[15], and keeping them up all night. Exhibit 22.[16] Compressor noise also affects flora and fauna. A study on lands near natural gas wells in New Mexico found that noise from the wells altered mice and bird communities, and hampered the dispersal of pinon pine seeds. Exhibit 23.[17] In undeveloped areas, there may also be noise associated with the construction of roads capable of supporting the traffic of supplies and machinery needed for drill rigs and other operations. Prevalent noise from fracking has serious implications for people who visit the Park. Those who stay in the canyon for extended periods, such as campers and Park staff, would be the most affected because the noise could interfere with sleep and daily activities. But anyone who comes to the park to enjoy the peace and quiet of its natural setting would be upset to discover that their hike, meditation, or relaxation is accompanied by the atmospheric din and intermittent blasts of nearby fracking operations. The human-caused noise may also disturb the viewing of local wildlife and vegetation.

3. Induced Seismicity

One of the most publicized and controversial effects of fracking is its potential for triggering seismic activity in the surrounding region. By its very nature, hydraulic fracturing induces micro-earthquakes when pressurized liquid is injected into wells to break up buried shale rock. The injection of waste water into disposal wells after its use in fracking is capable of causing even more powerful earthquakes because more liquid is pumped underground for longer periods of time. Exhibit 24.[18] Such quakes associated with fracking operations have been reported around the world, including a magnitude ("M") 2.3 quake in England, Exhibit 25[19], and all across the USA including a series of quakes M 5.0 and higher in Colorado. Exhibits 24, 26.[20]

Whether such quakes are directly caused by fracking-related procedures or are naturally-occurring is a hotly debated topic in the geological sciences, and the data are not conclusive for every instance. However, this very uncertainty, and the reasonable fear created by the

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[15] Malcolm Garcia, *NEW SOUTH JOURNALISM: Fracking Investigation*, Oxford American (August 27, 2012). http://www.oxfordamerican.org/articles/2012/aug/27/new-south-journalism-fracking-investigation/

[16] Eric Kahnert, *What's the fracking noise?*, Channel 9 News (May 30, 2012). http://www.9news.com/rss/story.aspx?storyid=270185

[17] Robin Ann Smith, Not just for the birds: Man-made noise has ripple effects on plants, too, EurekAlert! (March 20, 2012). http://www.eurekalert.org/pub_releases/2012-03/nesc-njf031412.php)

[18] Lamont-Doherty Earth Observatory. Columbia Univ., *Ohio Quakes Probably Triggered by Waste Disposal Well, Say Seismologists* (January 6, 2012). http://www.ldeo.columbia.edu/news-events/seismologists-link-ohio-earthquakes-waste-disposal-wells

[19] Induced Seismicity Potential in Energy Technologies, p.76.

[20] USGS Earthquake Hazards Program, Colorado Earthquake History, http://earthquake.usgs.gov/earthquakes/states/colorado/history.php

correlations between fracking and seismic activity, has inspired widespread public concern. Among the incidents likely caused by fracking was a M 5.7 quake that hit Oklahoma in 2011, Exhibit 24, itself part of a series of quakes M 5.0 and higher. One of the best documented cases of induced quakes from fluid injection is in the Paradox Basin, Colorado, where seismic events M 0.5 – 4.3 have been felt as far as 9.9 miles from the injection well. Exhibit 25.

One does not need to stretch the imagination to appreciate the implications for an ancient place such as Chaco Canyon and the surrounding landscape. The Park's ruins are built precariously against the canyon walls. Falling rocks and crumbling cliff faces from natural erosional processes already pose a danger to the fragile pueblo walls below, and a potential increase in seismic activity in the area could greatly exacerbate the natural weathering process in unnatural ways. This not only threatens the standing structures, but also the many hikers that visit the park and climb the canyon walls.

Pueblo Bonito showing rock fall from cliff face behind structure.
(Photo courtesy of Dave Barz)

Existing support for three-storey back wall of Pueblo Bonito.
(Photo courtesy of Dave Barz)

C. The National Park Service has Identified Energy Development on Public Lands as a Significant Threat to the Park.

Over the last two decades, the National Park Service has expressed concern with the impacts of energy development on the Park and Chacoan communities on the surrounding landscape. When it submitted the Chaco Culture WHS nomination in 1984, NPS noted that "mining and energy developments are threatening the integrity of the many outlying Chacoan communities." Exhibit 27.[21] BLM and NPS echoed this concern in 2005 in their joint status report to UNESCO on the condition of the Chaco Culture WHS:

> The original nomination noted that mining and energy development were threatening the integrity of the property and the associated outlying Chacoan communities. The San Juan Basin, in which the property is located, contains vast oil and natural gas deposits. Recent federal mandates and decisions encourage energy development on public lands. Within this region, the allowable spacing for well drilling was recently doubled, resulting in a corresponding increase in the amount of associated development (roads, production equipment, pipeline, and other transportation vehicles and facilities). . . . This has resulted] in intensive -- but indirect -- impacts to the properties and include increasingly lower air quality, disturbances to the extensive precolumbian cultural landscape, and other visual impacts. The park has identified energy development as the greatest external threat to park resources.[22]

Exhibit 28 at 21 (BLM & NPS, Chaco Culture WHS Periodic Report). NPS repeated these concerns in 2007, stating that "[o]il and gas exploration and development in the San Juan Basin has the potential to negatively impact some of the designated and other Chacoan outlier sites that may not be protected by federal laws." Exhibit 8. Thus, designating the Greater Chaco Landscape as an ACEC and withdrawing all unleased federal lands within the ACEC boundaries would impart a significant level of protection to the Park and the surrounding landscape.

VI. CONCLUSION AND REQUESTED RESPONSE

We request that BLM issue a response to this petition within 90 days, which we believe to be a reasonable time given that BLM plans to offer several leases that are close to the Park in the January 2014 lease sale. If you cannot make a decision on the merits of the petition within 90 days, we request that you notify the petitioners of your schedule of action within this time. We also request that BLM delay any lease sales that include leases within the proposed ACEC boundary until the agency resolves this Petition. If the Petition is granted, we request that BLM set a proposed schedule for the NEPA process that will support the RMP amendment. If BLM denies the petition, it is required to "set forth its reasons" so that petitioners can decide whether to initiate court review, and so that any reviewing court has a basis for review.

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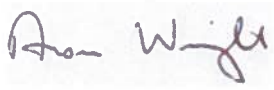
[21] United States of America, World Heritage Site Nomination: Chaco Culture National Historical Park at 23 (Nov. 1984), available at http://www.nps.gov/oia/topics/worldheritage/Nominations%20pdf/CHCU.pdf.

[22] Available at www.nps.gov/oia/topics/chcu.pdf.

Petitioners:



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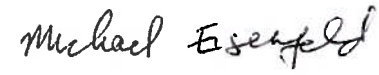

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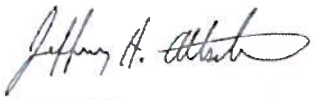

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Please direct any questions about the Petition or requests for additional information to Ms. Ruscavage-Barz.

List of Exhibits[23]

Exhibit 1	UNESCO, Chaco Culture Advisory Body Evaluation (1987)
Exhibit 2	Solstice Project, LiDAR Study Reveals Chaco Canyon's Great North Road
Exhibit 3	Excerpts from 2003 Record of Decision for Farmington Resource Management Plan
Exhibit 4	Boundary coordinates for proposed Greater Chaco Landscape ACEC
Exhibit 5	Excerpts from FEIS for 2003 Farmington Resource Management Plan
Exhibit 6	UNESCO selection criteria for World Heritage Sites
Exhibit 7	IDS Designation of CCNHP as a "Dark-Sky Park"
Exhibit 8	NPS, Chaco Culture National Historical Park: Foundation for Planning and Management (Sept. 2007)
Exhibit 9	BLM Master Leasing Plan Assessment
Exhibit 10	Excerpts from April 2013 Leasing EA
Exhibit 11	Excerpts from 2001 Reasonably Foreseeable Development Scenario for 2003 Farmington Resource Management Plan
Exhibit 12	Mead Gruver, *Wyoming Air Pollution Worse than Los Angeles due to Gas Drilling*, The Huffington Post (March 8, 2011)
Exhibit 13	Excerpts from National Parks Conservation Association, *National Parks and Hydraulic Fracturing* (2013)
Exhibit 14	Melissa C. Lott, *A New Light in the Sky - "Kuwait on the Prairie,"* Scientific American (Jan. 17, 2013)
Exhibit 15	CCNHP flyer describing Night Sky Program
Exhibit 16	CCNHP flyer describing hiking trails
Exhibit 17	United States Environmental Protection Agency, *EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector*, Report No. 13-P-0161 (Feb. 20, 2013)
Exhibit 18	David Kelly, *Study Shows Air Emissions Near Fracking Sites May Pose Health Risk*, University of Colorado (March 19, 2012)
Exhibit 19	*An Exploratory Study of Air Quality near Natural Gas Operations* (Nov. 8, 2012)

[23] All exhibits are included on a CD that accompanies this Petition.

Exhibit 20	Lisa Song, *Hazardous Air Pollutants Detected Near Fracking Sites*, Bloomberg (Dec. 3, 2012)
Exhibit 21	Malcolm Garcia, *NEW SOUTH JOURNALISM: Fracking Investigation*, Oxford American (Aug. 27, 2012)
Exhibit 22	Eric Kahnert, *What's the fracking noise?*, Channel 9 News (May 30, 2012)
Exhibit 23	Robin Ann Smith, Not just for the birds: Man-made noise has ripple effects on plants, too, EurekAlert! (March 20, 2012)
Exhibit 24	Lamont-Doherty Earth Observatory. Columbia Univ., *Ohio Quakes Probably Triggered by Waste Disposal Well, Say Seismologists* (Jan. 6, 2012)
Exhibit 25	Excerpts from Induced Seismicity Potential in Energy Technologies
Exhibit 26	USGS Earthquake Hazards Program, Colorado Earthquake History
Exhibit 27	United States of America, World Heritage Site Nomination: Chaco Culture National Historical Park (Nov. 1984)
Exhibit 28	BLM & NPS, Chaco Culture WHS Periodic Report (2005)
Exhibit 29	Excerpts from January 2014 Leasing EA

List of Figures[24]

[24] In addition to making the figures available as hard copies with this Petition, all figures are also included on a CD that accompanies this Petition.