Department of Environmental Quality
Air Quality Division
P.O. Box 1677
Oklahoma City, Oklahoma 73101-1677

Via Electronic Mail to Cheryl.Bradley@deq.ok.gov

May 20, 2013

Re: Proposed Regional Haze SIP Revision

To Whom it May Concern:

I write on behalf of Sierra Club and its 2.1 million members and supporters, including more than 3,000 members in Oklahoma, in strong support of the proposed Regional Haze SIP Revision.[1] The SIP fully complies with federal requirements to reduce regional haze and interstate pollution from the Northeastern coal-fired power plant in Oologah, Oklahoma. In addition to protecting scenic views in the region's most treasured parks, the SIP's requirement to retire one Northeastern unit by 2016, along with retrofits and a steady ramp-down of capacity at the other toward retirement in 2026, will have enormous public health benefits. It is also a more cost-effective solution than requiring the installation of expensive scrubbers on both units. For these reasons, Sierra Club urges the Oklahoma Department of Environmental Quality (DEQ) to promptly approve and finalize the SIP.

I. The SIP Revision Protects Our Parks.

In order to protect the "intrinsic beauty and historical and archeological treasures" at national parks, wilderness areas, and other designated "Class I" areas," Congress set a national goal to reduce human-caused haze pollution and achieve natural visibility conditions by 2064.[2] The Clean Air Act requires states to design an implementation plan to reduce haze from air pollution sources within its borders that cause or contribute to visibility impairment – i.e., hazy views – at any protected area located within or beyond that state's boundaries.

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[1] Sierra Club is submitting individual comments from 380 members and supporters under separate cover.

[2] See H.R. Rep. No.95-294, at 203-04 (1977); See 42 U.S.C. § 7491(a)(1); 40 C.F.R. § 51.308(d)(1)(i)(B).

Haze-forming pollution from the Northeastern plant currently impacts visibility in four popular scenic areas in the region: Wichita Mountains National Wildlife Refuge in Oklahoma, Caney Creek Wilderness and Upper Buffalo Wilderness in Arkansas, and Hercules Glade Wilderness in Missouri. The Wichita Mountains is the oldest managed National Widlife Refuge in the U.S. Fish and Wildlife system. It was designated as a forest preserve in 1901 and became a NWR in 1903. Scenic mountains and prairies make up the refuge's 59,020-acre landscape.[3] In 2011, over 118,000 people visited the refuge for enjoyment and recreation.[4] Hercules Glades, Caney Creek and Upper Buffalo are also valuable units of the national forest system. Hercules Glade includes some of "the most scenic and unique country in the Midwest," while Caney Creek and Upper Buffalo possess breathtaking views of the region from ridge tops and steep slopes.[5] Unfortunately, the views at these recreational areas are suffering from pollution from the region's coal-fired power plants. Visitors at Caney Creek can experience views up to 81 miles on a clear air day, but on hazy days this view is reduced to just 17 miles.[6] If visibility were at natural conditions, people would be able to see up to 170 miles into the distance.[7] In Upper Buffalo, visitors can see only 18-78 miles into the distance, but under natural visibility conditions they would be able to see between 79 and 171 miles.[8]

Current emissions of haze-forming pollution from the Northeastern Units 3 and 4 amount to approximately 32,000 tons per year sulfur dioxide (SO2) and more than 14,000 tons per year nitrogen oxides (NOx).[9] To reduce SO2 emissions, the SIP Revision requires Public Service Company of Oklahoma (PSO) to retire one unit by April 16, 2016 and retrofit the other with Dry Sorbent Injection by the same date.[10] PSO must reduce the remaining unit's capacity significantly starting in 2021, and retire the unit no later than December 31, 2026. The planned replacement power is a combination of cleaner resources: purchased power from an existing combined cycle natural gas plant, energy efficiency, and demand response programs.[11]

Implementation of the SIP will drastically reduce both SO2 and NOx emissions by 2016 and fully eliminate them by 2026. By April 16, 2016, assuming an 85% capacity factor

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[3] U.S. Fish and Wildlife, *Wichita Mountains Wildlife Refuge*, http://www.fws.gov/refuge/Wichita_Mountains/about.html.
[4] Phone interview between National Parks Conservation Association staff and Wichita Mountains Visitor Center representative (July 24, 2012).
[5] United States Forest Service, *Hercules Glades Wilderness*, http://www.fs.usda.gov/recarea/mtnf/recreation/hiking/recarea/?recid=21754&actid=51; *See* Univ. of Montana, College of Forestry, www.wilderness.net.
[6] U.S. Dep't of Agriculture, Caney Creek Wilderness – Natural Background Visiblity, http://www.fs.fed.us/air/technical/class_1/wilds.php?recordID=10.
[7] *Id.*
[8] *Id.*
[9] Oklahoma Regional Haze SIP Revision (Mar. 20, 2013), at 6 (Table II-1).
[10] As EPA has already approved the portion of the Oklahoma SIP that addresses NOx, the SIP Revision properly focuses on SO2.
[11] Direct Testimony of Steven L. Fate on Behalf of Public Service Company of Oklahoma & Direct Testimony of Scott C. Weaver on Behalf of Public Service Company, Oklahoma Corporation Commission, Cause No. PUD 2012000054 (Sept. 26, 2012).

at the unit that continues operating past that date, emissions will be slashed to 7,111 tons per year SO2 and 2,667 tons per year NOx.[12] Particulate matter emissions, which also contribute to haze and public health problems, will also see a drastic reduction.

Clearing the haze at these parks will both protect the health of those who recreate there and promote local tourism by decreasing the number of days when pollution impairs scenic views. DEQ's BART Determination predicts that the settlement agreement will reduce visibility impairment caused by the plant's SO2 and NOx pollution by approximately 80% in each of these regions compared with current conditions.[13] For example, instead of contributing to an average of 1.5 "deciviews"[14] of visibility impairment at Wichita Mountains, as it does now, after the retirement of one unit and installation of SO2 and NOx controls on the remaining unit, it will cause only .295 deciviews of impairment. Likewise, the reduction of nitrogen oxides (NOx) will result in 76 fewer days each year in which the Northeastern plant is contributing to visibility impairement in the Wichita Mountains, compared with the baseline, and 95 fewer days of impairment in Caney Creek Wilderness.[15]

The improvements in visibility attributable to the SIP Revision have a tangible economic benefit. Sierra Club members and other Americans visit national parks, national forests, and wilderness areas to recreate and see amazing views. In doing so, they contribute substantially to the American economy. In 2010, activities associated with national parks and other Department of Interior lands provided more than 2.2 million jobs, which generated $377 billion in economic activity.[16] National Wildlife Refuges and other US Fish and Wildlife Service land management contributed over $4 billion to the economy and supported over 32,000 jobs in 2010.[17] According to the Department of Agriculture, national forest land recreation visitors spend nearly $13 billion each year in rural communities surrounding national forests and wilderness areas.[18] This spending results in over $14 billion to the GDP and supports over 224,000 full and part time jobs.[19] As scenic views are an important part of the visitor experience at these parks, clearing away human-caused haze — allowing for visibility exceeding 170 miles in some areas — will serve to make them even more attractive destinations, with the corresponding economic benefit. Visitors to

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[12] *Id.* at 8 (Table II-3).
[13] *Id.* at 8, Table II-4.
[14] "The deciview metric provides a scale for perceived visual changes over the entire range of conditions, from clear to hazy. Under many scenic conditions, the average person can generally perceive a change of one deciview. The higher the deciview value, the worse the visibility. Thus, an improvement in visibility is a decrease in deciview value." *U.S. EPA, Regulatory Impact Analysis for the Final Clean Air Visibility Rule or the Guidelines for Best Available Retrofit Technology (BART) Determinations*, EPA-452/R-05-004 (June 2005).
[15] *Id.* at 3-1.
[16] Southwick Associates, *The Economics Associated with Outdoor Recreation, Natural Resources Conservation and Historic Preservation in the United States*, Oct. 10, 2011 at 4, *available at* http://www.trcp.org/assets/pdf/The_Economic_Value_of_Outdoor_Recreation.pdf.
[17] *Id.*
[18] U.S. Forest Service, *National Visitor Use Monitoring Results USDA Forest Service National Summary Report*, 2005-2009, at 2, *available at* http://www.fs.fed.us/recreation/programs/nvum/nvum_national_summary_fy2009.pdf.
[19] *Id.*

National Wildlife Refuges, Wilderness Areas, and National Parks consistently rate visibility and clear scenic vistas as one of the most important aspects of their experience.[20]

Compared to EPA's federal implementation plan ("FIP"), which the SIP Revision will replace, the SIP Revision provides more flexibility for PSO to comply with its obligations under the Clean Air Act's haze provisions, but does not compromise public health or visibility. The FIP requires PSO to meet an SO2 emission limit of .06 lbs/mmbtu, consistent with emissions reductions achievable with Dry Flue Gas Desulfurization units with Spray Dry Absorbers, by January 27, 2017 (five years after the rule's effective date). While benefits to visibility as of January 27, 2017 would be slightly greater under the FIP, the advantage is temporary. The FIP scenario may have somewhat lower impacts for several years, but the SIP Revision better achieves the overall goals of the Regional Haze program because emissions from both units will be completely eliminated by 2026.[21] Under the FIP scenario, both units would be permitted to continue operating and polluting beyond 2026 and would likely do so until the plants are no longer economical to operate, regardless of the health or visibility impacts. By 2026, Northeastern's contribution to haze in the region's parks will be zero under the SIP Revision whereas under the FIP scenario the plants would continue to contribute to more than .2 deciviews of impairment (at much greater cost).

In fact, the benefits of the SIP Revision for visibility as compared to the FIP are likely understated in DEQ's analysis. DEQ compares emission rates with DSI and NOx limits of .15 lb/mmbtu on one unit and the other unit's retirement as of April 16, 2016 with the dry scrubber/SDA and the same NOx limit as of December 31, 2017 pursuant to the FIP. *See* Revised BART Determination, pp. 7-10. This has several implications for the analysis. First, DEQ did not evaluate the likely reductions in visibility impairment as the second unit ramps down capacity between 2016 and 2026, thereby reducing emissions. As a result, it is unclear how long the FIP scenario would hold even its small advantage in terms of visibility improvements. Additional modeling taking into account the emissions reductions after 2016 would provide further support for the SIP Revision. Another advantage of the SIP Revision is that it requires an earlier implementation of lower NOx emission limits than in the original SIP or EPA's FIP. *See* Revised BART Determination at 12. As noted by DEQ, "This early implementation schedule reducing emissions by 43% will provide previously unanticipated improvements in visibility as well as reductions in local formation and interstate transport of ozone." DEQ did not compare the reductions in visibility impairment during the three years from December 31, 2013, when the SIP Revision begins to require reductions, to January 2017, when the FIP would have done so. Similarly, the SIP Revision deadline for SO2 reductions of April 16, 2016 is 8.5 months earlier than the January 2017 FIP deadline, leading to an additional reduction of 26,700 tons of SO2. DEQ did not take into account these reductions when comparing the visibility benefits of the SIP Revision with those of the FIP.

Overall, the SIP Revision is the less polluting option. DEQ calculates that due to the decreased capacity utilization and early shutdown schedule, cumulative SO2 and NOx

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[20]The Clean Air Task Force, *Out of Sight: Haze in Our National Parks*, Sept. 200, at 2, *available at* http://www.catf.us/resources/publications/files/Out_of_Sight.pdf .

[21] Supplemental BART Determination Information at 4-7.

emissions from Northeastern Units 3 and 4 will ultimately amount to only 36% of the emission that could be emitted under the FIP. *See* Revised BART Determination at 12. This approach is consistent with Congress's goal of eliminating human-caused haze by 2064, moving Oklahoma toward that goal more quickly than would the FIP.

II. The SIP Revision Protects Our Health.

Pollutants that cause visibility impairment also harm public health. NOx is a precursor to ground level ozone, which is associated with respiratory diseases, asthma attacks, and decreased lung function. In addition, NOx reacts with ammonia, moisture, and other compounds to form particulates that can cause and worsen respiratory diseases, aggravate heart disease, and lead to premature death.[22] Similarly, SO_2 increases asthma symptoms, leads to increased hospital visits, and can form particulates that aggravate respiratory and heart diseases and cause premature death.[23] Both these pollutants contribute to formation of fine particulate matter (PM). PM can penetrate deep into the lungs and cause a host of health problems, such as aggravated asthma, chronic bronchitis, and heart attacks.[24] By drastically reducing these pollutants and requiring the eventual retirement of the Northeastern plant, the SIP Revision will have significant public health benefits.

The Clean Air Task Force, a not-for-profit advocacy and research organization, commissioned a study by Abt Associates to quantify death and other health effects from coal-fired power plants' PM pollution. The study's conclusions for the Northeastern plant are reproduced below. Each number represents the impact on an annual basis.

Northeastern Rogers County, Oklahoma	
Deaths:	62
Heart Attacks:	94
Asthma Attacks:	1,100
Hospital Admissions:	44
Chronic Bronchitis:	38
Asthma ER Visits:	67

[22] EPA, Health – Nitrogen Dioxide, http://www.epa.gov/air/nitrogenoxides/health.html (last visited Apr. 1, 2011).
[23] EPA, Health – Sulfur Dioxide, http://www.epa.gov/air/sulfurdioxide/health.html (last visited Apr. 1, 2011).
[24] EPA, Health & Environment – Particulate Matter, http://www.epa.gov/air/particlepollution/health.html (last visited Apr. 1, 2011); *National Ambient Air Quality Standards for Particulate Matter; Final Rule*, 78 Fed. Reg. 3086, 3088 (Jan. 15, 2013), *available at* http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf. ("EPA is revising the annual PM2.5 standard by lowering the level from 15.0 to 12.0 mg/m3 so as to provide increased protection against health effects associated with long-and short-term exposures…. This action provides increased protection for children, older adults, persons with pre-existing heart and lung disease, and other at-risk populations against an array of PM2.5- related adverse health effects that include premature mortality, increased hospital admissions and emergency department visits, and development of chronic respiratory disease.")

Source: http://www.catf.us/fossil/problems/power_plants/existing/map.php?state=Oklahoma.

By dramatically reducing the PM precursors SO2 and NOx, and directly emitted PM, the SIP revision will save lives and reduce hospital visits and asthma attacks.

The Northeastern plant's NOx emissions, and their contribution to ozone, are particularly problematic for the region's efforts to maintain healthy air quality levels. Tulsa has recently struggled with numerous "ozone-alert" days during the summer season. EPA is considering revising the 8-hour ozone National Ambient Air Quality Standard (NAAQS) from 75 ppb down to 60-70 ppb. EPA has stated that it will propose the revision in 2013 and issue a final rule in 2014. EPA predicts that if the NAAQS for ozone is revised to 65 ppb, the Tulsa metropolitan area will fall out of attainment.[25] A "nonattainment" designation could have significant economic impacts as Tulsa is forced to find ways to cut existing emissions and limit new emissions-causing development. As DEQ has noted, the NOx reductions from the SIP Revision will help address local formation and interstate transport of ozone whereas "the FIP scenario provides no further improvement in ozone." Revised BART Determination at 11.

Northeastern's SO2 emissions also threaten to cause exceedances of federal air quality standards. Sierra Club and EPA Region 6 have both conducted air dispersion modeling showing that the plant's emissions contribute to ambient SO2 levels that exceed the 1-hour federal standard.[26] The SIP Revision will address this problem by dramatically reducing SO2 emissions.[27]

In addition to SO2, NOx, and PM, Northeastern releases approximately 210 pounds of mercury to the environment each year.[28] Atmospheric deposition of one gram of mercury is enough to contaminate fish in a 20-acre lake.[29] The 210 pounds produced by Northeastern each year amounts to around 95,000 grams. The SIP Revision will drastically reduce these harmful releases by 2016 and fully eliminate them by 2026.

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[25]EPA, *Counties Projected to Violate Primary 8-hour Ground-Level Ozone Standard in 2020, at http*://www.epa.gov/glo/pdfs/CountyOzoneLevels2020primary.pdf.

[26] *Preliminary 1-Hour SO2 Modeling of Some Coal-Fired EGUs in Oklahoma: Preliminary Results,* EPA Region 6 Air Modeling Team (2011); Letter from A. Issod, Sierra Club to E. Terrill, Air Quality Division Director, attaching modeling report of C. Sears (June 3, 2011).

[27] Sierra Club's air dispersion modeling for the Northeastern plant demonstrated that the Northeastern plant's emissions causes ambient air concentrations of SO2 that are significantly higher than the 2010 1-hour SO2 NAAQS (259.3 ug/m^3, compared with the NAAQS of 196 ug/m^3). On the assumption that ambient air concentrations correlate to emissions on a roughly linear basis, eliminating half of the plant's hourly SO2 emissions by 2016 should resolve this problem.

[28] *See* EPA, Toxic Release Inventory, TRI Explorer, *at* http://iaspub.epa.gov/triexplorer/tri_release.facility (input Oklahoma/Rogers County/mercury compounds/all industries).

[29] Minnesota Pollution Control Agency, Michigan Dep't of Natural Resources, Wisconsin Dep't of Natural Resources, "Mercury in the Environment: The Waste Connection," 1995 (discussed at http://www.newmoa.org/prevention/mercury/mercurylake.pdf).

As discussed further below, the Clean Air Act and the regulations governing DEQ's BART determination instruct DEQ to consider the "non air-quality environmental impacts," of emissions of the pollutant in question. 70 Fed. Reg. 39,104, 39,169 (July 6, 2005). "Such environmental impacts include solid or hazardous waste generation and discharges of polluted water from a control device." *Id.* Accordingly, DEQ can properly consider that the SIP Revision will ensure that all of the human health and environmental impacts of coal combustion will be addressed by 2026, not just selected air emissions. Coal-fired power plants produce huge amounts of coal combustion waste, or coal ash. Laden with heavy metals and other harmful toxics known to contaminate water supplies, these wastes cause injury and death to livestock and wildlife, and threaten human health with birth defects, cancer, and organ and neurological damage. The Northeastern plant currently disposes of its waste coal ash (more than 200,000 tons of it in 2011) by putting it into an unlined (or "clay-lined") landfill. This natural barrier does not adequately protect against groundwater contamination.[30] A 2011 review of water samples from groundwater wells contaminated by coal ash from the Northeastern plant revealed that levels of chromium, a cancer-causing metal, were more than four times higher than the federal drinking water standard.[31]

Wastewater discharge from coal-fired power plants, particularly those with SO2 scrubbers, also poses major environmental and public health problems. Scrubbers at coal-fired power plants have the unfortunate consequences of transferring air pollution to water pollution if not properly treated.[32] EPA states: "More than 23,000 miles of rivers and streams are damaged by steam electric plant discharges, which include arsenic, mercury, lead, boron, cadmium, selenium, chromium, nickel, thallium, vanadium, zinc, nitrogen, chlorides, bromides, iron, copper and aluminum. For example, each year nearly 65,000 pounds of lead and 3,000 pounds of mercury are discharged, leading to lowered IQs among children exposed to these pollutants via drinking water or by eating fish. Many of these toxic pollutants, once in the environment, remain there for years. Additionally, each year nearly 80,000 pounds of arsenic is released into surface waters, increasing the risk of cancers and other health effects in humans exposed to these pollutants through drinking water and by eating fish."[33]

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[30] EPA, *Frequent Questions: Coal Combustion Residues (CCR) - Proposed Rule.* (Available at http://www.epa.gov/wastes/nonhaz/industrial/special/fossil/ ccr-rule/ccrfaq.htm#8.) ("EPA's risk assessment suggests, and damage cases confirm, that the management of CCRs in unlined and clay-lined landfills and surface impoundments may present risks to human health and the environment through leaching. For landfills and surface impoundments the primary concern is cancer risk from arsenic in drinking water. Surface impoundments also showed high non-cancer risks from cobalt and nitrate/nitrite in drinking water.")

[31] Lisa Evans, Earthjustice, et al., *EPA's Blind Spot: Hexavalent Chromium in Coal Ash* (Feb. 2011), p. 7, *available at* http://www.psr.org/resources/epas-blind-spot-hexavalent-chromium-coal-ash.html.

[32] *See Cleansing the Air at the Expense of Waterways*, The New York Times (Oct. 12, 2009), at http://www.nytimes.com/2009/10/13/us/13water.html?_r=4&ref=us& (describing how scrubber retrofits on coal-fired power plants have lead to increased water pollution)

[33] EPA Fact Sheet: Proposed Effluent Limitation Guidelines & Standards for the Steam Electric Power Generating Industry, EPA - 821-F-13-002 (April 2013).

By requiring the retirement of one coal-burning unit in 2016 and the other by 2026, the SIP Revision will reduce both the production of dangerous coal ash that leaks into groundwater supplies and the discharge of pollutants in wastewater.

III. The SIP Revision Will Conserve Water Resources.

The SIP Revision's impact on the state's dwindling water resources is also worth noting in light of the extreme drought conditions facing Oklahoma, and DEQ's mandate to consider nonair environmental impacts. In response to Sierra Club data requests in proceedings before the Oklahoma Corporation Commission, PSO has estimated that the increase in water consumption at the Northeastern plant if it were to add dry scrubbers to both units would be at least 65 times greater than with a retrofit of ACI and DSI at one unit pursuant to the SIP Revision.[34] Under continued drought, PSO's daily need for water resulting from scrubber retrofits could increase the potential for conflict with other needs in the Tulsa area. The Northeastern units currently intake water from the City of Tulsa, and the surrounding area includes a variety of farms and ranches. As a result of the SIP revision, water currently used by one unit will be released for other uses by 2016, and after 2026, the units will no longer demand water resources. Sierra Club supports a plan that will ease pressure on the state's water supplies.

IV. The SIP Revision is Less Costly Than Requiring Scrubbers.

Due to its agreement to phase out the Northeastern units instead of investing in expensive new flue gas desulfurization equipment (scrubbers) at both units, PSO estimates that the cost-effectiveness in terms of dollars per ton of SO2 removed is $942/ton for the SIP Revision compared with $1,544/ton under the FIP.[35] DEQ similarly estimates that the cost per ton reduction for DSI is $1,005/ton compared with $1,544/ton for scrubbers. Sierra Club has not evaluated the company's and DEQ's analysis in detail but agrees that the SIP Revision is more cost-effective – and, indeed, less costly overall.

Because DEQ is charged only with revising the SIP as it pertains to BART for SO2, it was appropriate for DEQ to consider the cost of control per removal of a ton of SO2. The scope of this cost analysis, focusing on the direct control costs for each type of emissions control (DSI or scrubbers) properly follows the mandatory federal guidelines for BART Determinations. These guidelines instruct DEQ to "(1) Identify the emissions units being controlled, (2) Identify design parameters for emission controls, and (3) Develop cost estimates based upon those design parameters." 70 Fed. Reg. at 39,166. The Guidelines further instruct DEQ to consider estimates of capital and annual costs for the "control equipment" or the "control technology." *Id.*

As DEQ complied with the above guidelines (discussed further below), DEQ's review of costs in the BART analysis is complete and legally sufficient. However, because some

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[34] Oklahoma Corporation Commission, Cause No. 201200054, PSO Response to Sierra Club Data Request 5-9 (Dec. 20, 2012) (attached hereto as Exhibit 1) (Controls pursuant to EPA settlement will consume approximately 11,250 gallons of water per day, compared with the DFGD option, which would consume approximately 737,000 - 805,000 gallons of water per day for two units).
[35] *Id.* at 4-4.

interested parties may comment on overall cost of the SIP Revision and its impact on electric rates, Sierra Club briefly addresses this issue as well to provide DEQ, and the public, with a complete picture.

The SIP Revision not only permits PSO to avoid the high cost of installing and operating scrubbers; by providing for the retirement of a unit in 2016, it also assures that PSO will avoid the costs of other upcoming regulations that would require that unit to internalize the costs of its air, water, and coal ash pollution and other harm to the environment. Pursuant to the SIP Revision, PSO will avoid costs associated with an array of future regulations at one or both units, including:[36]

- ***Coal Combustion Residuals.*** The EPA proposed two alternative rules on June 21, 2010, but has not yet finalized either rule. The Northeastern facility's coal ash landfill has only an "in-situ clay liner," meaning that the landfill currently does not have a synthetic liner to protect against toxics that may be leaching into groundwater or surface water and causing risks to human health.[37] Regardless of how the rule is finalized, it is reasonable to expect that to continue operating beyond 2016, Northeastern would have to address this issue. To convert its landfill to appropriately handle ash waste could cost $30 million or more.[38]

- *Effluent Limitations Guidelines.* EPA issued proposed effluent limitations for coal-fired power plants in April 2013. The proposed rule would establish new requirements for wastewater streams from FGD (scrubbers), fly ash, bottom ash, and flue gas mercury control, all of which would be present at the Northeastern units if they continued to operate. EPA has proposed four options, with varying degrees of control for each waste stream, including specific limits for certain pollutants in the FGD waste stream, dry-handling (zero discharge) of fly ash or bottom ash, or both. This rule could pose significant costs for the Northeastern units were they to continue to operate, especially because scrubbers create enormous amounts of polluted wastewater.

- *Revised NAAQS for Ozone*. As noted above, EPA predicts that Tulsa will be out of attainment in 2020 if the ozone standard is revised to 65 ppb or lower. Oklahoma would need to further reduce regional NOx emissions, which could ultimately require installation of expensive Selective Catalytic Reduction units at the Northeastern units. DEQ estimated in its original BART determination for Northeastern that the capital cost of installing SCR at the Northeastern units would be $290 million, with an annual cost of control (including both capital and operational costs) amounting to approximately $48 million [39]

- *One-Hour SO2 Primary NAAQS*. As noted above, the one-hour SO2 standard poses significant challenges for coal-fired power plants. A study by Burns & McDonnell

[36] Although PSO may have to implement changes at the unit that continues to operate until 2026, its costs will be lower than if both units continued to operate.
[37] *See supra* note 30.
[38] North American Reliability Council*, 2010 Special Reliability Assessment Scenario: Resource Adequacy Impacts of Potential U.S. Environmental Regulations*, October 2010, p. 56.
[39] DEQ, Air Quality Division, Northeastern BART Application Analysis (Jan. 19, 2010), Table 5.

concluded that "both scrubbed and unscrubbed boilers will have difficulty complying with the new one-hour SO2 NAAQS during short-term high emissions."[40] Further reducing SO2 emissions, even after installing scrubbers, would require additional investments not necessary under the SIP Revision.

- *Cross State Air Pollution Rule.* The EPA has a statutory duty to require states to address emissions that "contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to [the NAAQS]."[41] As the NAAQS get tighter, there is greater likelihood that an upwind state will contribute to nonattainment in a downwind state. As a result, although the 2010 version of CSAPR was vacated by the D.C. Circuit, future regulations on interstate air pollution implemented to comply with the D.C. Circuit's opinion could be even stricter. The regulations will have to address lower annual standards for fine particulate matter (PM2.5), which were finalized in January 2013, as well as updated ozone standards, which are expected to be finalized in 2014.[42] By agreeing to phase out its coal units, PSO likely avoids significant costs of this future rule.

- *Greenhouse Gas New Source Performance Standards for Existing Units.* The EPA has indicated that it plans to issue rules to address greenhouse gases from existing coal-fired power plants. Although EPA has not determined a specific timeline, its statutory duty to do so will be triggered when it finalizes its proposed regulations for new units, now expected in March 2013. (See Clean Air Act, Section 111(d), which requires EPA to prescribe regulations addressing any air pollutant "to which a standard of performance under this section would apply if such existing source were a new source"). The costs of compliance could be significant. A 2012 study by Synapse Energy Economics reports that, in 55 publicly available forecasts of allowance prices by electric utilities, the forecasted price for 2030 ranges from $10/ton (2012$) to $80/ton (2012$).[43]

By transitioning to cleaner alternatives than coal, PSO will avoid these and other future regulatory costs, all of which could have been passed on to ratepayers. These cost savings are in addition to the millions of dollars saved by installing DSI instead of scrubbers.

V. The SIP Revision is Consistent with the State Energy Plan.

Although not directly relevant to DEQ's statutory obligations, Sierra Club also supports the SIP Revision because it is consistent with the State of Oklahoma's energy

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[40] Robynn Andracsek, et al, Burns & McDonnell, "Flue Gas Desulfurization-Equipped Coal-Fired Power Plants: Will They Comply with the 1-Hour National Ambient Air Quality Standard for Sulfur Dioxide?", TECHBriefs 2011 No. 2, p. 2, *available at* http://www.burnsmcd.com/Resources/Article/Flue-Gas-Desulfurization-Equipped-Coal-Fired-Power-Plants.

[41] *See* Clean Air Act Section 110(a)(2)(d)(i).

[42] *National Ambient Air Quality Standards for Particulate Matter; Final Rule*, 78 Fed. Reg. 3086 (Jan. 15, 2013), *available at* http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf.

[43] Synapse Energy Economics, Inc., *2012 Carbon Dioxide Price Forecast*, October 4, 2012, p. 22, *available at* http://www.synapse-energy.com/Downloads/SynapseReport.2012-10.0.2012-CO2-Forecast.A0035.pdf.

plan. The state energy plan prioritizes the increased use of Oklahoma's energy resources such as wind and natural gas, and protection of public health and the environment.[44] Oklahoma is an exporter of both natural gas and wind, but a major importer of coal, including the coal burned by the Northeastern units. In 2012, Northeastern imported more than 3.6 million tons of coal from mines in Wyoming and other out-of-state mines at a cost of more than $75 million.[45] Adding scrubbers would have continued those imports, requiring rail transport of large amounts of coal. The SIP Revision will instead encourage use of Oklahoma resources and the elimination of Northeastern's coal imports by 2026.

Transitioning from coal to gas, wind, energy efficiency, and demand response also has significant benefits for the overall reliability of the grid. As the amount of wind in Oklahoma and the Southwest Power Pool (SPP) rises, fossil generation will need to ramp production up and down more frequently, and to shut down for various periods of time during high wind production. Switching to natural gas, wind, energy efficiency and demand response, result in resources better suited to integrate with variable wind generation, both technically (since coal plants generally ramp more slowly than gas plants and often require longer periods between starts and stops) and economically (since the large investment in scrubbing and other environmental compliance will be partially stranded if coal units are often ramped down to accommodate wind energy, while gas plants would avoid their fuel costs).

American Electric Power (AEP), PSO's parent company, has acknowledged that this transition to cleaner, local, more flexible fuel sources will impact its employees currently employed in the coal sector. Sierra Club shares the concern that the transition occur in a way that is sensitive to the employees and communities affected by plant retirements, not least because Sierra Club members also live in these communities. As the largest power company in the country, AEP has extraordinary resources to help redeploy its coal sector employees, and has committed to doing so.[46] Oklahoma will be in need of workers in the power sector throughout the state's transition away from coal. New jobs will be created in transmission line construction, wind energy, solar power, and energy efficiency. The gradual nature of the PSO plan allows for PSO and the overall state economy to make the transition to a power fleet without coal in a way that allows for gradual placements of workers into new positions within the power industry. AEP notes that attrition across its company may create opportunities; the number of employees may increase at units where environmental controls are retrofit; and potential acquisition (purchase or construction) of replacement power may create openings. AEP plans to provide a variety of assistance programs, from advising its hiring managers when applicants are from impacted facilities

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[44] Governor Mary Fallin & Secretary of Energy Michael Ming, Oklahoma First Energy Plan (2011), at 3, 5, *available at* http://www.ok.gov/governor/documents/Governor%20Fallin's%20Energy%20Plan%20-%20Jan%202012.pdf

[45] SNL Financial (based on Energy Information Administration Form EIA-923 filings).

[46] *See* AEP, Human Resources for Employees, http://www.aep.com/community/PlantRetirements/HumanResourcesProgramsForEmployees.aspx ("AEP will do everything it can to assist employees whose jobs will be eliminated due to the premature retirements of generating units."; listing wide variety of programs)

to providing education assistance programs.[47] While these issues are not factors that DEQ may consider in its BART analysis, Sierra Club believes they are important issues for the public to be aware of.

VI. The SIP Revision Satisfies DEQ's Legal Obligations Under the Clean Air Act.

The Clean Air Act charges each state with the initial responsibility for preparing a Regional Haze SIP, but grants EPA with oversight authority. This oversight ensures that each State's SIP considers each statutory factor in a way that is rational, supported by the evidence, and consistent with nationwide standards. EPA approved the majority of the Regional Haze SIP submitted by Oklahoma in 2010, but disapproved of Oklahoma's approach to SO2 BART. Oklahoma's BART determination did not require any coal-fired power plants to actively reduce SO2 emissions, requiring them only to continue using low-sulfur coal. Finding that Oklahoma had not properly evaluated the cost-effectiveness of scrubbers according to federal guidelines, EPA issued its own plan for SO2 emissions and required that six coal-fired units meet an emissions limit of .06 lbs/mmbtu, either by installing dry flue gas desulfurization units or switching to natural gas.

The SIP Revision is a practical and legally sufficient response to EPA's disapproval of Oklahoma's BART determinations for sulfur dioxide for the Northeastern units.[48] Sierra Club agrees with DEQ that, with respect to the Northeastern units, the SIP Revision also addresses the state's obligation to address the visibility impacts of pollution transported to other states. The SIP Revision will also contribute to the state's "reasonable progress toward meeting the national goal" of eliminating human-caused visibility impairment by 2064. 42 U.S.C. § 7491(b)(2).

In making a BART determination, the Clean Air Act requires states to consider (1) the costs of compliance; (2) the energy and nonair quality environmental impacts of compliance; (3) any existing pollution control technology in use at the source; (4) the remaining useful life of the source; and (5) the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology. 42 U.S.C. § 7491(g)(2); 40 C.F.R. 51.308(e)(1)(ii).

Pursuant to the BART regulations issued by EPA, the first step before evaluating costs is identifying technically feasible control options. DEQ evaluated two control options: installing Dry FGD with Spray Dry Absorber on both units (the FIP scenario) and installing DSI on one unit and shutting down the other by 2016 (the settlement scenario). DEQ properly took into account one unit's retirement as part of the control scenario. The statute itself instructs states to contemplate "the remaining useful life of the source," 42 U.S.C. § 7491(g)(2), and EPA's BART Guidelines acknowledge that a unit may "agree to shut down" prior to the statutory deadline for BART controls. 70 Fed. Reg. 39,104, 39,127 (July 6, 2005). It is well within DEQ's discretion, and makes good practical sense, to take into account PSO's enforceable commitment to retire one unit by 2016 in comparing costs. The

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[47] *See* AEP, Human Resources for Employees, http://www.aep.com/community/PlantRetirements/HumanResourcesProgramsForEmployees.aspx.

[48] Because Oklahoma continues to dispute appropriate BART determination for the four remaining units, owned by Oklahoma Gas & Electric, this SIP Revision does not fully displace the FIP.

BART Guidelines require that if the "date the facility permanently stops operations [. . .] affects the BART determination, this date should be assured by a federally- or State-enforceable restriction preventing further operation." 70 Fed. Reg. at 39,169. DEQ has satisfied this requirement by entering into an "enforceable administrative order" with AEP/PSO. Revision at 6 & Appendix III. This order must be incorporated as part of the SIP, and enforceable by citizens, the state, and EPA, to assure compliance with the Act.

The next step is calculating the annual costs for each scenario. Sierra Club did not conduct a detailed evaluation of DEQ's cost assumptions, but supports DEQ's approach of using a methodology consistent with EPA's Air Pollution Control Cost Manual and EPA's analysis supporting the FIP.[49]

Next, the state must evaluate cost-effectiveness, or the cost per ton of SO2 reduced. Unlike many BART analyses, which would compare control technologies on a unit operating at the same capacity level for the same period of time, DEQ was faced here with two very different scenarios, in that the controlled unit will operate only until 2026 and will steadily ramp down capacity starting in 2021. To make an "apples-to-apples" comparison as required by the BART regulations, DEQ considered emissions reductions with the DSI option as if the controlled unit would consistently operate at 85% capacity through 2026. Revised BART Determination at 6-7. Moreover, because the unit will cease operating in 2026, DEQ was careful to annualize the DSI option's costs over 10 years instead of 30, as for DFGD. *Id.* at 6. Pursuant to this approach, DEQ concluded that the DSI option, at $1005/ton reduced, is more cost-effective that DFGD, at $1,544/ton. *Id.* at 7. Taking into account the capacity reductions, the gap is larger. According to the company's estimate, 26,558 tons of SO2 will be removed under the DSI/shutdown scenario through 2026, resulting in a cost-effectiveness of $942/ton. Supplemental BART Determination Information, Appendix A, at 2.

EPA also instructs states to evaluate "incremental cost-effectiveness," or the cost of each additional ton removed by the more expensive option that achieves greater reductions.[50] The incremental cost-effectiveness of the DFGD option is $4,718/ton in the first year. Taking into account additional reductions in SO2 as the unit decreases its capacity utilization, the incremental cost-effectiveness worsens to $7,794/ton. *See* Supplemental BART Determination Information, Appendix A, at 2-3. As noted in the BART regulations, "[o]f course, there may be other differences between these options, such as, energy or water use, or non-air environmental effects, which should also be considered in selecting a BART technology." 70 Fed. Reg. at 39,167.

The state is next instructed evaluate these "other differences," including whether each control option results in energy penalties or benefits. DEQ did not evaluate the differences in energy use between the two options in detail, but notes that energy consumption will be reduced by half as a result of the shutdown of one unit. DEQ also could

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[49]DSI may have greater than zero landfill costs, contrary to DEQ's analysis. However, even if landfill costs were included, the DSI/shutdown scenario would be more cost-effective than DFGDs.

[50] (Total Annualized Cost for Option 1 – Total Annualized Cost for Option 2)÷ (Annual Emissions for Option 1 – Annual Emissions for Option 2). 70 Fed. Reg. at 39,167.

have considered the greater energy requirements of DFGD technology as compared to DSI as a factor supporting its BART selection.

Next, the state must consider "non-air quality environmental impacts." This is a broad category, including "relative quantities of water used and water pollutants produced and discharged as result of the use of each alternative emission control system," and "where possible, . . . the effect on ground water and . . . local surface water quality parameters." 70 Fed. Reg. at 39,169. The state may also consider the "quality and quantity of solid waste . . . that must be stored and disposed of or recycled;" the "irretrievable commitment of resources (for example, use of scarce water resources," and other adverse environmental impact such as hazardous waste discharges. *Id.* Because the retirement of one unit at Northeastern will promptly reduce the plant's solid waste, water use, and wastewater by half, the proposed SIP Revision scenario is the clear winner for these factors.

In addition, DFGD would use an enormous amount of water in comparison to DSI. As discussed above, PSO has estimated that the increase in water consumption at the Northeastern plant if it were to add dry scrubbers to both units would be at least *65 times greater* than with a retrofit of ACI and DSI at one unit pursuant to the SIP Revision.[51] Another crucial disadvantage of adding a DFGD at each unit is that it would create a new source of highly polluted wastewater at the plant. EPA has recently initiated a rulemaking to address, among other issues, the toxic-laden wastewater associated with SO2 scrubbers. In light of the many environmental advantages of the proposed SIP Revision compared to the FIP – which would perpetuate the burning of coal at both units, and all its associated pollution, for years to come – this factor of the BART analysis weighs clearly and heavily in favor of the SIP Revision.

Finally, the state must determine the visibility impacts of its BART determination. The deciview improvements are "weighed among the five factors, and [the state is] free to determine the weight and signficance to be assigned to each factor." 70 Fed. Reg. at 39,170. Sierra Club has not reviewed the modeling assumptions and protocol in detail but supports the approach of following the modeling that EPA conducted in support of the FIP. Revised BART Determination at 8.

DEQ notes that visibility improvements would slightly greater under the FIP in 2016, but that these improvements would not be "perceptible." Revised BART Determination at 11. Although we agree with DEQ's overall conclusion that the proposed SIP Revision is preferable, and that the differences in visibility improvements are quite small, we disagree that DEQ may disregard a .1 deciview improvement. "Failing to consider less-than-perceptible contributions to visibility impairment would ignore the CAA's intent to have BART requirements apply to sources that contribute to, as well as cause, such impairment." 70 Fed. Reg. at 39,129. While Sierra Club does not necessarily agree with each and every rationale DEQ has relied upon in its analysis, Sierra Club supports the proposed SIP Revision because it ultimately will better achieve natural visibility by 2064

[51] Oklahoma Corporation Commission, Cause No. 201200054, PSO Response to Sierra Club Data Request 5-9 (Dec. 20, 2012) (attached hereto as Exhibit 1) (Controls pursuant to EPA settlement will consume approximately 11,250 gallons of water per day, compared with the DFGD option, which would consume approximately 737,000 - 805,000 gallons of water per day for two units).

(as discussed in Section I above), it complies with the BART guidelines, and it will provide a host of environmental and public health benefits that could not be achieve by a retrofit alone.

The state then has the discretion to choose the "best" option, so long as it has considered the above factors consistent with the BART guidelines, and "provide[d] a justification." 70 Fed. Reg. at 39,170-71. For all of the reasons above, Sierra Club believes DEQ correctly and justifiably chose the alternative that provides for the gradual phase-out of the Northeastern coal units. We enthusiastically support the SIP Revision and urge DEQ to promptly move forward with finalizing and implementing the rule.

Sincerely,

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Enclosure: Exhibit 1