

February 20, 2018

Via FAX AND U.S. Postal Service

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Acting State Director
Bureau of Land Management
Eastern States Office
20 M Street SE, Suite 950
Washington, D.C. 20003

The Center for Biological Diversity (the "Center"), Heartwood, Keep Wayne Wild, Ohio Environmental Council ("OEC"), Sierra Club, Buckeye Environmental Network formerly known as Buckeye Forest Council ("BEN"), and Athens County Fracking Action Network ("ACFAN"), (collectively "Conservation Groups") hereby file this Protest of the Bureau of Land Management's ("BLM") planned March 22, 2018 Competitive Oil and Gas Lease Sale and the Determination of NEPA Adequacy (DNA) for oil and gas leasing in the Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe and Noble Counties, Ohio (DOI-BLM-Eastern States-0030-2017-0006-DNA) ("DNA"), pursuant to 43 C.F.R. § 3120.1-3. We formally protest the inclusion of each of the two parcels, covering 345.49 acres in Ohio:

ES-004-03/2018 OHES 059251 ACQ
ES-002-12/2018 OHES 059252 ACQ

PROTEST

I. Protesting Party: Contact Information and Interests

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The Center is a non-profit environmental organization dedicated to the protection and recovery of native species on the brink of extinction and their habitats through science, policy, and environmental law. The Center has and continues to actively advocate for increased protections for species and their habitats in Ohio and the Wayne National Forest. The lands that will be affected by the proposed lease sale include habitat for listed, rare, and imperiled species that the Center has worked to protect, including the Indiana bat, Northern long-eared bat, fanshell, pink mucket pearly mussel, sheepsnose mussel, and snuffbox mussel. The Center also works to reduce greenhouse gas emissions to protect biological diversity, our environment, and public health. The Center has over 52,000 members, including those living in Ohio who have visited these public lands in the Wayne National Forest for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future, and are particularly interested in protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

The Sierra Club is a national nonprofit organization of approximately 838,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. The Ohio Chapter of the Sierra Club has more than 23,000 members in the state of Ohio. For more than four decades, the Sierra Club has

worked to protect the Wayne National Forest and Ohio's other public lands from harmful activities such as clear-cutting, mineral extraction, commercial development, pipelines, and oil and gas drilling. Sierra Club members use the public lands in Ohio, including the lands and waters that would be affected by actions under the lease sale, for quiet recreation, scientific research, aesthetic pursuits, and spiritual renewal. These areas would be threatened by increased oil and gas development that could result from the proposed lease sale.

The Ohio Environmental Council is a non-profit environmental organization whose mission is to secure healthy air, land, and water for all who call Ohio home. OEC has over 100 environmental and conservation member organizations and thousands of individual members throughout the state of Ohio. The OEC has a long history of working to protect the ecological integrity, and recreational and aesthetic qualities of the Wayne National Forest. Many of our members have visited these public lands in the Wayne National Forest for recreational, scientific, educational, and other pursuits and intend to continue to do so in the future.

Heartwood is a non-profit regional environmental organization dedicated to protecting the public forests of the Central Hardwood Region. Heartwood represents over seventeen hundred individual members and numerous member organizations who depend on these public lands, including the Wayne National Forest, for recreational, spiritual and ecological purposes. Heartwood members have, do and will continue to use these public lands, including the Wayne National Forest, for non-consumptive purposes and they derive important tangible and intangible ecological benefits from the presence and ecological integrity of these public lands, including the lands that will be affected by the oil and gas leasing proposed by this action.

The Buckeye Environmental Network aka Buckeye Forest Council (BEN) is a membership-based, grassroots organization dedicated to protecting Ohio's native forests and their inhabitants through education, advocacy and organizing. BEN has advocated for ecological management of the Wayne National Forest as well as Ohio's state forests to protect biodiversity, ecosystem services, including air and water purification, and climate stability since 1992. Many hundreds of BEN members from around Ohio and beyond our region have relied on Wayne National Forest as a place of solace, protected wild land, native forest biodiversity, and low-impact recreation.

Athens County Fracking Action Network (ACFAN) was formed in 2011 to protect the Wayne National Forest and our region from the risks to air, water, climate, and community economic and public health from the industrial practice of deep shale drilling and high-pressure, high-volume horizontal fracturing (commonly known as fracking). ACFAN's 900+ network members have consistently urged Wayne and BLM personnel to fully evaluate the potential highly significant impacts of fracking before leasing, an irrevocable commitment of resources, with full public input, as required by NEPA. This has not been done in spite of thousands of appeals and documentation of potential impacts with extensive peer-reviewed science through petitions, meetings, letters, and formal protests since October 2011. ACFAN has mobilized government officials from the local to federal levels as well as drinking water suppliers, environmental and tourism organizations, the President of Ohio University, hundreds of residents of Washington, Monroe, and Morgan County, and thousands of other residents of Ohio, the region, and the nation to urge the USFS to authorize an Environmental Impact Statement before

further consideration of this dangerous industrial process, as required by NEPA given the scale of likely harm to the human community as well as to the Forest. Especially because the Wayne is Ohio's only National Forest and one of the nation's smallest and most fragmented, members of ACFAN are highly committed to its protection and to the USFS and BLM taking seriously the extreme and well documented public concerns that have been shared extensively with USFS and BLM officials since 2011.

Keep Wayne Wild is a volunteer-run organization working to raise awareness about the importance of protecting Ohio's only national forest and how it could be impacted by fracking. We began organizing in response to the Bureau of Land Management's decision to begin auctioning off land in Wayne National Forest for horizontal hydraulic fracturing. Our efforts include educational presentations and informational meetings around the region, group outings and activities in Wayne National Forest, distributing information at events and via social media, and organizing and participating in public demonstrations. Our members include people who regularly visit the Marietta Unit for recreation including hiking, camping, kayaking on the Little Muskingum River, deer hunting, wildlife photography, and mushroom foraging. Some of our members live just outside of the forest in Washington and Monroe counties, where they will be impacted by the increased traffic and pollution.

II. Statement of Reasons as to Why the Proposed Lease Sale Is Unlawful

BLM's proposed decision to lease the parcels listed above is procedurally and substantively flawed for the reasons discussed below and in the following attached references:

Neither the BLM nor the U.S. Forest Service (USFS) have adequately assessed the potential environmental effects associated with the leasing and development of the parcels listed above, nor of the some-40,000 acres of the Wayne National Forest BLM proposes to lease in its 2016 Leasing EA. BLM relies on several NEPA documents and related documents to determine NEPA adequacy,¹ but none of these documents adequately address surface, water, air, and wildlife impacts associated with high-volume, horizontal oil and gas development, including both forest-wide cumulative effects and site-specific effects of leasing the proposed parcels.

The Conservation Groups have detailed these NEPA deficiencies extensively in our October 12, 2017 Protest of the BLM's December 14, 2017 Competitive Oil and Gas Lease Sale and the Determination of NEPA Adequacy (DNA) for oil and gas leasing in the Wayne National Forest, Marietta Unit of the Athens Ranger District (DOI-BLM-Eastern States-0030-2017-0006-DNA), and in the Center et al.'s September 6, 2017 Comments on the BLM's Determination of NEPA Adequacy for the December 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest. The Conservation Groups hereby incorporate both of the aforementioned documents by reference (attached as Exhibits A and B, respectively), as well as all references cited therein.²

¹ U.S. BLM, The Final Environmental Assessment, Finding of No Significant Impact, and Decision Record for Oil and Gas Leasing, Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, and Washington Counties, Ohio (2016); U.S. BLM, Supplemental Information Report, Horizontal Drilling Using High Volume Hydraulic Fracturing (2012) (2012 SIR); U.S. BLM, Final Revised Land and Resource Management Plan Final Environmental Impact Statement, Wayne National Forest (2006 Forest Plan FEIS) and Record of Decision (January 2006).

² All references cited herein and in Exhibits A - D are submitted on the enclosed CD.

In addition, BLM's site-specific Draft EA for the Rolland Well APDs ("Rolland EA") demonstrates that the line of NEPA documentation relied upon by BLM (beginning with the 2006 Wayne Forest Plan and Final EIS) grossly underestimates the amount of surface disturbance associated with horizontal oil and gas development, and fails to account for disturbance from gathering pipelines. The 2006 Forest Plan and Final EIS placed an upper limit on surface disturbance from oil and gas well sites in the Marietta Unit of 135 acres of short-term disturbance and 59 acres of long-term, post-reclamation disturbance.³ The Leasing EA estimates the disturbance footprint from horizontal well pad sites to be 3 to 5.5 acres. It further estimates that the average access road would disturb 2 acres, and that the average gathering line would disturb 0.5 acres, when co-located with the access road.⁴

The Rolland EA, for its part, states that the Rolland well pad "has a short and long-term surface disturbance of approximately 4 acres."⁵ The Rolland EA later contradicts this statement when it states that the surface disturbance from the construction of the access road and well pad "affected approximately 24 acres."⁶ As the undersigned now know, both APDs list the long- and short-term disturbance from the access road as 10 acres, and the long- and short-term disturbance for the well pad as 24.59 acres.⁷ This reported footprint dwarfs the 3- to 5.5-acre well site and 2-acre road estimates provided in the Leasing EA.

Not even the Rolland EA bothers to analyze, let alone mention, gathering line disturbance – even though the Rolland APDs themselves disclose 68.87 acres of gathering line surface disturbance associated with just the single Rolland well site.⁸ The Rolland APDs further disclose 34.59 acres of long-term surface disturbance from the well site and access road – a figure that dwarfs the *short-term* 3- to 5.5-acre well site and 2-acre road disturbance estimates provided in BLM's Leasing EA. In short, BLM's existing NEPA analysis of surface disturbance impacts is woefully inadequate, both at the programmatic and site-specific levels.

In addition, the Leasing EA fails to analyze impacts of oil and gas leasing on local surface waters and communities near the proposed parcels. Parcel OHES059251 (EOI 2257) is located near Harrietsville and several streams are near the parcel.⁹ There is no way that the Leasing EA could have analyzed impacts to this parcel as it was not identified in the Leasing EA as available for leasing.¹⁰ Nor did the public have any notice and opportunity to comment on proposed leasing in this part of the Wayne National Forest during BLM's approval of this parcel. Indeed, BLM failed to identify in the Leasing EA over half of the parcels proposed for oil and gas leasing, because the map in the Leasing EA only identifies those parcels which had been

³ See Leasing EA at 24; 2006 FEIS Appendix G, Table G-1, p. G-1.

⁴ Leasing EA at 25.

⁵ U.S. DOI-BLM, Environmental Assessment for Rolland Applications for Permit to Drill, DOI-BLM-Eastern States-0030-2017-0008-EA ("Rolland EA") at 11.

⁶ Rolland EA at 40.

⁷ Eclipse Resources, Rolland APDs at 29.

⁸ See Eclipse Resources, Rolland APDs.

⁹ See Center for Biological Diversity, Map of EOI 2257.

¹⁰ Compare Center for Biological Diversity, Map of Proposed March 2018 Lease Parcels (showing location of parcel near Harrietsville, on western edge of Marietta Unit) with Leasing EA at 143 (map of requested parcels, which fails to show this parcel).

requested for oil and gas leasing through expressions of interest (EOI)—roughly 18,000 acres—as of April 2016.¹¹

BLM has also failed to initiate or complete consultation under section 106 of the National Historic Preservation Act (NHPA) with respect to this parcel (and all others not identified in the Leasing EA), to ensure that impacts on historical, cultural, and tribal resources are minimized or avoided. The NHPA consultation that BLM previously requested only covered those parcels which had been requested for leasing as of November 2015.¹² But this parcel is not identified as within that set of parcels.¹³ There is no basis for the Leasing EA and FONSI, and the Determination of NEPA Adequacy to conclude that leasing of this parcel will not result in any significant environmental impacts on cultural, tribal, and historical resources.

With respect to parcel OHES059252 (EOI 1637), this parcel is within a half mile of the Ohio River and even closer to Jim's Run.¹⁴ But the Leasing EA fails to analyze site-specific impacts of water depletions, surface disturbance, and toxic spills on the Ohio River's many natural resource and recreational values, which could foreseeably result from oil and gas leasing.

The Conservation Groups hereby incorporate by reference our November 30, 2017 Comments and our January 24, 2018 Supplemental Comments on BLM's Environmental Assessment for Rolland Applications for Permit to Drill (DOI-BLM-Eastern States-0030-2017-0008EA) (attached as Exhibits C and D, respectively), as well as all references cited therein.

For the foregoing reasons, both the DNA and the December 2016 Programmatic EA on which it relies, fail to take a hard look at the environmental consequences of the BLM's decision to offer the proposed parcels for lease, in violation of NEPA. In addition, the BLM has failed to consult with the USFWS over the impact of its leasing decision on threatened and endangered species, such as the Indiana bat and Northern long-eared bat, and improperly relies on an outdated biological opinion to fulfill its consultation duties under the ESA. BLM has also failed to properly consult with Tribes and the Ohio State Historic Preservation Office under section 106 of the NHPA. For these reasons, in addition to those stated above, BLM may not lease the proposed parcels until it prepares appropriate NEPA documentation to analyze the foreseeable impacts of its decision to lease the parcels, nor may BLM lease the proposed parcels until it fulfills consultation requirements with the USFWS, Tribes, and the Ohio State Historic Preservation Office. Thank you for your time.

Sincerely,

¹¹ See Leasing EA at 143 (showing only "Marietta Unit EOIs to date").

¹² See U.S. BLM, Consultation Letter to Ohio Historic Preservation Office (Nov. 16, 2015) (identifying consultation as covering only EOIs) ("OHPO Consultation Letter"); U.S. BLM, Consultation Letters to Tribes (Nov. 6, 2015).

¹³ See, e.g., OHPO Consultation Letter at PDF 11-13.

¹⁴ See Center for Biological Diversity, Map of EOI 1637.

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List of References

Center for Biological Diversity, Map of EOI 1637

Center for Biological Diversity, Map of EOI 2257

Center for Biological Diversity, Map of Proposed March 2018 Lease Parcels

Eclipse Resources, Rolland APDs

U.S. Bureau of Land Management, Consultation Letter to Ohio Historic Preservation Office (Nov. 16, 2015)

U.S. Bureau of Land Management, Consultation Letters to Tribes (Nov. 6, 2015)

U.S. Bureau of Land Management, Final Revised Land and Resource Management Plan Final Environmental Impact Statement, Wayne National Forest (2006 Forest Plan FEIS) and Record of Decision (2006)

U.S. Bureau of Land Management, The Final Environmental Assessment, Finding of No Significant Impact, and Decision Record for Oil and Gas Leasing, Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, and Washington Counties, Ohio (2016)

U.S. Bureau of Land Management, Supplemental Information Report, Horizontal Drilling Using High Volume Hydraulic Fracturing (2012)

U.S. Dept. of Interior & U.S. Bureau of Land Management, Environmental Assessment for Rolland Applications for Permit to Drill, DOI-BLM-Eastern States-0030-2017-0008-EA

List of Exhibits

Exhibit A- October 12, 2017 Protest of the BLM's December 14, 2017 Competitive Oil and Gas Lease Sale and the Determination of NEPA Adequacy (DNA)

Exhibit B- Center et al.'s September 6, 2017 Comments on the BLM's Determination of NEPA Adequacy for the December, 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest

Exhibit C- Center et al.'s November 30, 2017 Comments on Environmental Assessment for Rolland Applications for Permit to Drill

Exhibit D- Center et al.'s January 24, 2017 Supplemental Comments on Environmental Assessment for Rolland Applications for Permit to Drill

EXHIBIT A



October 12, 2017

Via FAX AND U.S. Postal Service

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ES-001-12/2017 OHES 058308 ACQ
ES-002-12/2017 OHES 058309 ACQ
ES-003-12/2017 OHES 058310 ACQ
ES-004-12/2017 OHES 058311 ACQ
ES-005-012/2017 OHES 058312 ACQ

PROTEST

I. Protesting Party: Contact Information and Interests

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protecting the many native, imperiled, and sensitive species and their habitats that may be affected by the proposed oil and gas leasing.

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with full public input, as required by NEPA. This has not been done in spite of thousands of appeals and documentation of potential impacts with extensive peer-reviewed science through petitions, meetings, letters, and formal protests since October 2011. ACFAN has mobilized government officials from the local to federal levels as well as drinking water suppliers, environmental and tourism organizations, the President of Ohio University, hundreds of residents of Washington, Monroe, and Morgan County, and thousands of other residents of Ohio, the region, and the nation to urge the USFS to authorize an Environmental Impact Statement before further consideration of this dangerous industrial process, as required by NEPA given the scale of likely harm to the human community as well as to the Forest. Especially because the Wayne is Ohio's only National Forest and one of the nation's smallest and most fragmented, members of ACFAN are highly committed to its protection and to the USFS and BLM taking seriously the extreme and well documented public concerns that have been shared extensively with USFS and BLM officials since 2011.

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II. Statement of Reasons as to Why the Proposed Lease Sale Is Unlawful

BLM's proposed decision to lease the parcels listed above is procedurally and substantively flawed for the reasons discussed below and in the following attachments:

First, the Conservation Groups hereby incorporate by reference the Center et al.'s September 6, 2017 Comments on the BLM's Determination of NEPA Adequacy for the December, 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest, as well as all references cited therein.¹

Next, BLM failed to prepare an Environmental Impact Statement (EIS) analyzing the impacts of competitive oil and gas leasing in the Wayne National Forest, and specifically the impacts of leasing the aforementioned parcels, in violation of the National Environmental Policy Act (NEPA). Relatedly, BLM failed to take a hard look at site-specific, reasonably foreseeable, and cumulative impacts of leasing in the Wayne. Further, BLM's Determination of NEPA Adequacy ("DNA") improperly relied on the December 2016 Final Environmental Assessment, Finding of No Significant Impact, and Decision Record for Oil and Gas Leasing, Wayne

¹ The Center et al.'s September 6, 2017 Comments on Determination of NEPA Adequacy, December, 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest.

National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, and Washington Counties, Ohio (collectively, the “EA” OR “Programmatic EA”) to analyze those impacts.

In addition, BLM failed to analyze the cumulative impacts of oil and gas leasing in connection with the impacts of neighboring pipelines and other infrastructure associated with fracking in the Wayne (in particular risks associated with the Rover Pipeline currently under construction). It also failed to demonstrate that new oil and gas development in the Wayne National Forest conforms with the State Implementation Plan for attainment of sulfur dioxide air quality standards under the Clean Air Act.. Finally, BLM failed to consult with the Fish and Wildlife Service (“FWS”) pursuant to Section 7 of the Endangered Species Act (ESA) on the impacts of leasing on threatened and endangered species present in the Wayne National Forest and improperly relied on an outdated biological opinion to fulfill its Section 7 obligations.

1. The Programmatic EA Fails to Consider the Potential for New Federal Leasing to Open Up Private Minerals and Private Surface to Horizontal Drilling

The DNA’s reliance on the Programmatic EA violates NEPA because the EA fails to clearly disclose that leasing federal minerals would open up substantial private minerals and private surface for development. This is because large portions of the Marietta Unit are private surface or private mineral and surround tracts of federal minerals, which are too small to develop on their own, but which operators wish to access to develop adjacent private minerals. Further, any horizontal drilling and related oil and gas operations would likely occur on private surface, as operators would likely prefer to develop on private surface out of the reach of federal surface regulations. The EA’s acknowledgement that leasing federal minerals within the Marietta Unit “*may lead to additional future mineral development on private land and private minerals within the area*”² understates the reality that leasing federal minerals within the Unit would not only certainly enable private mineral and surface development, but also appears geared towards that end.³ The EA, however, is less than forthcoming about this purpose and need, as well as these foreseeable consequences of federal leasing. The EA’s failure to clearly acknowledge, analyze, and discuss mitigation for these entirely foreseeable consequences renders the EA fundamentally flawed.

In scoping, proponents of federal leasing argued that development of private minerals would be difficult, if not impossible, without BLM’s leasing of federal minerals for development. As Senator Andy Thompson explained in his comments to BLM:

The main issue here isn’t merely mineral extraction; it’s property rights. Unlike federal lands in the Western U.S., the Wayne National Forest is not one large contiguous piece of property. Wayne National Forest property is often next to or surrounding property owned by individual Ohioans. Leasing of Wayne National

² Final EA at 120 (emphasis added).

³ Final EA at 21 (identifying public’s concern that “[e]nabling oil and gas activities will provide private landowners the opportunity to develop their minerals, and withholding leasing the federal minerals will pose an obstacle to development of private minerals”). *See also id.* at 30 (rejecting no-action alternative because it “would unnecessarily constrain oil and gas occupancy, especially in this highly fragmented landscape, where the ability to cross federal land may be critical to enabling an operator to develop”).

Forest property simply gives private citizens the opportunity, if not the guarantee, to develop the minerals they own.⁴

Congressman Bill Johnson's comments to BLM echoes this issue that private mineral leases cannot be developed unless federal minerals in the Wayne National Forest are opened for leasing:

Some residents, particularly in Monroe and Washington Counties, have elected to lease their private mineral rights for the purpose of oil and natural gas development. But many are finding themselves in a situation where their private leases are at risk of not being developed because their private mineral leases are adjacent to, or under the surface of, the Wayne National Forest.⁵

Indeed, the EA itself acknowledges surface and mineral ownership is "highly fragmented and complicated" throughout the Wayne National Forest.⁶ Over three-quarters of the Marietta Unit is private surface, almost all of which overlays private minerals.⁷ Federal surface within the Marietta Unit is scattered throughout this area and is non-contiguous.⁸ Of this federal surface, nearly three-quarters is underlain by private oil and gas.⁹

In 2012, the Forest Service prepared a Supplemental Information Report ("2012 SIR") addressing the potential impacts of horizontal well development, to assess whether the 2006 Forest Plan should be updated. According to the Forest Service's 2012 SIR, horizontal drilling is only economically feasible if sufficiently large expanses of minerals are available.¹⁰ The 2012 SIR projects that 10 horizontal well pads could be developed on federal surface in the Marietta Unit and that horizontal wells would likely target the Utica and Marcellus shales.¹¹ To drill up to eight wells from a single horizontal well pad, the scenario considered in the 2012 SIR, each lateral wellbore would extend one to two miles,¹² with a minimum spacing of 1,000 feet between

⁴ Downing, B. Strong support in southern Ohio for Wayne NF drilling. Akron Beacon Journal. Ohio.com. (Jan. 22, 2016), available at <http://www.ohio.com/blogs/drilling/ohio-utica-shale-1.291290/strong-support-in-southern-ohio-for-wayne-nf-drilling-1.656368> (accessed November 4, 2016).

⁵ *Id.*; see also Landowners for Energy Access and Safe Exploration (LEASE), Press Release, Landowners Encourage Public Comment In Support of Leasing Wayne (May 11, 2016), available at <http://www.ohio.com/blogs/drilling/ohio-utica-shale-1.291290/ohio-landowners-urge-blm-to-proceed-with-wayne-nf-drilling-1.682216> (spokesperson of private mineral owners complaining that delay in leasing has "block[ed] landowners from developing their private mineral rights" and that "should the agency take no further action, landowners' private property rights would continue to be squandered").

⁶ Draft EA at 18.

⁷ Draft EA at 50.

⁸ U.S. Forest Service, Athens Ranger District- Marietta Unit Map, available at http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5108534.pdf.

⁹ Draft EA at 50.

¹⁰ "Horizontal drilling into a formation requires that the formation in question be thick enough that the drill bit can penetrate the formation, be turned horizontally and remain in the formation during drilling and production. *The driller must also have the right to access a continuous and large enough portion of the formation to make the wells economically viable.*" 2012 SIR, Appendix C at 2 (emphasis added).

¹¹ 2012 SIR at 4.

¹² Geology.com, Utica Shale – Horizontal Wells Drilled in Ohio, available at <http://geology.com/utica.shtml> (noting horizontal wells can extend underground up to two miles beyond the drilling location); FracTracker, Ohio Shale Gas Viewer (showing horizontal wellbores of one to two miles), available at <http://maps.fractracker.org/3.13/?appid=2b7611b38d434714ba2033d76cc0ccc3> & <http://maps.fractracker.org/3.13/?appid=1d7ab8d708544885a3bb093cd82b30d4>; see also Wickstrom, Larry et al.,

each lateral.¹³ The total production area per well pad amounts to approximately one to two square miles, or 640 to 1,280 acres.

Many of the nominated parcels for lease, however, are substantially smaller than 640 or 1,280 acres and thus would not be exploitable via horizontal drilling unless they were “pooled” with adjacent private minerals. By the same token, private oil and gas extraction within the Marietta Unit may not be feasible unless the minerals are pooled with adjacent federal minerals. Further, if horizontal wells could be drilled from different locations, operators would undoubtedly choose to drill from private surface where they would be subject to the least stringent regulations, and less federal oversight.¹⁴ BLM and Forest Service officials recognized this fact while BLM was preparing the EA.¹⁵ And “[g]iven the highly fragmented nature of land ownership in the Marietta Unit, a well pad on one parcel, federal or private, may be serviced by roads, pipelines, tank batteries, and other infrastructure on other parcels in other ownerships.”¹⁶

Thus, a reasonably foreseeable consequence of federal leasing is opening up private surface for oil and gas development, including private surface overlying private minerals. Indeed, development on the proposed parcels and on adjacent private surfaces are connected actions and inextricably linked, such that private surface development should have been considered in the EA. *See Sierra Club v. United States DOE*, 255 F. Supp. 2d 1177, 1185 (D. Colo. 2002) (“NEPA regulations define a connected action as one that ‘cannot or will not proceed unless other actions are taken previously or simultaneously.’”) (citing 40 C.F.R. § 1508.8(a)(1)(ii)).

Neither the EA nor its underlying documents, however, meaningfully analyze the potential for federal oil and gas leasing to open up private minerals and lands. The 2004 Reasonably Foreseeable Development Scenario (“2004 RFDS”) prepared for the Wayne National Forest only analyzed the total number of *vertical* well pads that could be developed on *federal* surface.¹⁷ The 2004 RFDS formed the basis for the 2006 Forest Plan EIS’s effects

The Utica-Point Pleasant Shale Play of Ohio, Ohio Dept. of Natural Resources, Division of Geological Survey at 5, available at https://geosurvey.ohiodnr.gov/portals/geosurvey/energy/Utica-PointPleasant_presentation.pdf (“Wickstrom”) (“Optimally, operators would like to have lease blocks of about 2 square miles contiguous to allow drilling in two directions from one central drill pad.”).

¹³ For wells over 4,000 feet deep, the minimum spacing is 1,000 feet (vertically and horizontally). 2012 SIR at 3. Utica shale is around 6,000 to 7,000 feet deep. *See* Wickstrom at 30; *see also id.* at 6 (noting 1,000 foot spacing).

¹⁴ “With only 7 wells on federal surface over the last 8 years, the extensive drilling in Washington and Monroe Counties has not significantly impacted the WNF. This lack of drilling activity in the Marietta Unit is most likely attributed to operator’s disdain for the additional paperwork and operating requirements associated with being on Forest Service surface and their unwillingness to wait for the necessary authorization to begin their projects (The average time to receive a drilling permit from the Ohio Division of Oil and Gas was 12.6 days in 2002 compared to Forest Service processing times requiring from 60 days to one year.)” 2012 SIR, Appendix B at 12; *see also* Final EA at 95-96 (“noting operators “may use directional drilling to locate a pad on a parcel not directly above the bottom hole location for various reasons, thus enabling federal minerals to be accessed from outside the federal surface.”).

¹⁵ *See* Email from Thomas Thompson U.S. Forest Service to BLM officials re: WNF Oil and Gas leasing (Sept. 8, 2015) (“The first choice of preference would be the lessees will try and drill off lease (private land), this would be depending [sic] what minerals they have leased from the private land owner, then they may have no choice but to drill on federal land.”).

¹⁶ Final EA at 95.

¹⁷ 2012 SIR, Appendix B at 1 (forecasting “total number of new wells and associated surface disturbance that will

evaluation. In the 2012 SIR, the Forest Service considered whether the new potential for horizontal well development would exceed the development footprint projected in the 2004 RFDS and 2006 Forest Plan EIS, and concluded it would not. But the 2012 SIR's horizontal well projection only includes "well sites that may take place on federal minerals or private minerals *underlying WNF surface lands*," disregarding the potential for private surface land development within the Wayne's administrative boundary.¹⁸ The EA adopts the 2012 SIR's curtailed analysis.

While the EA attempts to respond to the Conservation Group's previously stated concerns regarding the Draft EA's total disregard of this issue, the Final EA not only downplays the significance and effects of private surface development, but its discussion of these effects is incoherent and inconsistent. On the one hand, the Final EA suggests that one of the purposes of the action is to enable private mineral development that could not otherwise occur without federal leasing. In rejecting the "NSO stipulation alternative"—which would have prohibited surface occupancy on all lands available for leasing—BLM noted that this alternative "would not fulfill the purpose and need" of the action as it "would unnecessarily constrain oil and gas occupancy, *especially in this highly fragmented landscape*, where the ability to cross federal land *may be critical* to enabling an operator to develop."¹⁹ This explanation strongly suggests that BLM is not simply concerned with allowing operators to develop federal land and minerals, but is also concerned with allowing development of private land and minerals in the Wayne National Forest's "highly fragmented landscape."²⁰ As explained above, private mineral access in the Wayne National Forest cannot occur without BLM opening up federal minerals for leasing.

On the other hand, the Final EA's analysis of the No Action Alternative (i.e., no leasing) misleadingly suggests that private mineral development within the Wayne National Forest would occur regardless of federal leasing: "Without a lease (No Action Alternative), operators would not be authorized to access federal minerals at the time of development but could develop adjacent privately owned minerals, potentially resulting in drainage of federal minerals without benefit to the government. Therefore, not leasing the parcel would not meet the purpose of and need for the Proposed Action."²¹

Further, the Final EA greatly understates the importance of federal leasing in allowing private mineral development and fails to analyze the extent to which private oil and gas development could occur by (1) suggesting that private mineral and private surface development are merely *possible* effects of federal leasing (federal leasing "*may lead to additional future mineral development on private land and private minerals within the area*"²²) and (2) treating private mineral and surface development as a "cumulative action" that would not necessarily directly result from federal leasing, but could happen coincidentally alongside federal mineral development.²³ By mischaracterizing private mineral and surface development as merely a "potential cumulative action," BLM purports to limit its analysis of these effects in the Final

likely occur on federal surface over the next 10 years, regardless of mineral classification").

¹⁸ 2012 SIR at 3.

¹⁹ *Id.* at 30 (emphases added).

²⁰ *Cf.* Final EA at 17 (merely noting proposed action's purpose is "to support the development of oil and natural gas resources that are essential to meeting the nation's future needs for energy").

²¹ Final EA at 30.

²² Final EA at 120 (emphasis added).

²³ Final EA at 23.

EA's cursory "cumulative effects" section. *See* Final EA at 23 ("These lands and minerals [i.e., private inholdings with private minerals] were not included in the Proposed Action, but are acknowledged as a potential cumulative action."). Confusingly, however, elsewhere the EA purports to analyze private surface development as part of the proposed action, claiming that the EA's discussion of federal surface impacts also applies to private surface: "All anticipated resource impacts would be associated with the potential impacts of future oil and gas development on both the Forest Service lands and on adjacent private lands within the Marietta Unit."²⁴

In any case, the EA fails to conduct any quantitative or meaningful qualitative analysis of air, water, soil, or other impacts from oil and gas development on the adjacent private lands, as further discussed below. Moreover, because the EA equivocates as to whether private surface development is a result of the proposed action or merely a cumulative action, it is unclear whether BLM and Forest Plan mitigation requirements discussed throughout the EA would apply to private surface.²⁵ To the extent the EA relies on the 2012 SIR, that document only addresses federal surface impacts and largely rests on mitigation requirements in the 2006 Forest Plan, which only applies to federal surface.²⁶ As a result, the entire EA is infected by BLM's failure to clearly analyze and disclose the private-land and private-mineral development impacts of leasing federal minerals in the Marietta Unit. By opening up federal *and* private minerals to drilling, and consequently overlying private surface, the proposed leasing could dramatically increase the total number of new well pads and wells, total surface disturbance, watershed impacts, cumulative air pollution emissions, public health risks, habitat loss, and disturbance to wildlife. Below are examples of impacts that are likely to result from opening up private mineral development, which BLM failed to consider.

a. The EA Fails to Analyze Disturbance from Private Surface Development

BLM's analysis of surface disturbance impacts from private development is cursory, if not completely lacking. This is especially troubling given that (1) development on private surface is more likely than development on federal surface (when federal and private mineral resources are pooled), as noted above,²⁷ and (2) BLM and Forest Service regulations would not necessarily mitigate the effects of such development, as the EA suggests.²⁸

²⁴ Final EA at 80.

²⁵ BLM's insertion of Appendix C in the Final EA, which merely discusses the state and federal agencies that have jurisdiction over non-federal land and non-federal minerals, does not make up for this shortfall. While BLM may take into account any regulations in its analysis of foreseeable impacts, it cannot claim – without analysis and quantification of potential effects and of effectiveness of potential mitigation or state regulations – that no significant impacts would result from its action simply because other agencies have regulatory authority. *See Nat'l Parks & Conservation Assoc. v. Babbitt*, 241 F.3d 722, 734 (9th Cir. 2001) ("A perfunctory description or mere listing of mitigation measures, without supporting analytical data, is not sufficient to support a finding of no significant impact." [citations and internal quotation marks omitted]); *Dine Citizens Against Ruining Our Env't v. Klein*, 747 F. Supp. 2d 1234, 1258 (D. Colo. 2010) (same).

²⁶ *See, e.g.*, 2006 Forest Plan FEIS at 3-115 ("Management of non-Federal lands are under the discretion of the landowner and conservation measures applied on NFS lands may not be used on these other ownerships.").

²⁷ *Cf.* EA at 30 (noting only that "operators could choose to locate potential future well pads and other infrastructure on land owned by the WNF").

²⁸ *Compare* Final EA at 23 ("There would be very little federal oversight in the development of private minerals under federal surface....") and EA at 120 (noting "federal oversight of mineral development on federal land/federal

The Final EA fails to analyze or quantify how much new private surface disturbance could result from new leasing, or where such disturbance could occur, among a host of other potential effects discussed further below. There is thus no evidentiary or scientific basis for the Final EA's conclusion that "[t]he amount of surface disturbance projected on the WNF with the use of high-volume, horizontal fracturing technology is within the amount of surface disturbance analyzed in the 2006 Forest Plan Final EIS (2012 SIR, p. 45, 47, 49)."²⁹ The 2006 Forest Plan Final EIS did not take into account private surface disturbance, nor did the 2006 Reasonably Foreseeable Development Scenario ("RFDS") include any projections of disturbance on adjacent private lands.³⁰ BLM clearly has the means to quantify this disturbance, as it has done in other Reasonably Foreseeable Development Scenarios.³¹

BLM also failed to take into account the disturbance on private surface that would be left unmitigated, which could impact streams, exacerbate the spread of invasive species, and increase habitat fragmentation. For example, although BLM intends to require operators to reclaim disturbed areas on federal surface, BLM will only require an operator using private land to have a land use agreement with the private owner, "which *may* detail minimum reclamation requirements."³² The Final EA therefore does not provide adequate assurance that impacts from private surface disturbance will be mitigated to less than significant levels. *See Davis v. Mineta*, 302 F.3d 1104, 1125 (10th Cir. 2002) ("Mitigation measures may be relied upon to make a finding of no significant impact only if they are imposed by statute or regulation, or submitted by an applicant or agency as part of the original proposal... As a general rule... agencies... should not rely on the possibility of mitigation as an excuse to avoid the EIS requirement.").

b. The EA Fails to Consider Impacts to Vegetation and Sensitive or Endangered Species Habitat from Development of Private Minerals / Private Lands

The EA failed to meaningfully analyze vegetation impacts on private lands. This missing analysis is important for determining potential habitat impacts on the Indiana bat and other bat species, which would be adversely affected by the removal of oak hickory and other suitable habitat. The Final EA notes that while "vegetative cover types on the federal lands are well delineated" —enabling BLM "to state where development may have different types of impact and where development would be restricted in order to protect plant and animal habitat and populations"—"[t]his is not true for the private lands."³³

minerals is more stringent than on private land/private minerals") with EA at 23 (suggesting that BLM and Forest Service have control over activities "no matter the ownership status of the minerals"), *id.* at 105 (noting "BLM and Forest Service would not approve water withdrawals that would draw down a surface waterbody to the extent that aquatic life would be measurably adversely impacted," without addressing whether this applies to well development on private surface), and *id.* at 57 (stating "when federal minerals are leased by BLM, all *surface* and downhole activities must comply with federal regulations," without noting BLM's limited authority over private surface development [emphasis added]).

²⁹ Final EA at 95.

³⁰ Final EA at 25.

³¹ *See, e.g.*, BLM, White River Field Office, Colorado Reasonably Foreseeable Development Scenario, 36 (2007) (quantifying number of wells and surface disturbance on private land within planning area); BLM, Grand Junction Reasonably Foreseeable Development Scenario (2012) ("The Study Area includes all lands within the Grand Junction Field Office boundary regardless of surface or mineral ownership.").

³² Final EA at 102 (emphasis added).

³³ EA at 96.

The Final EA notes that for private lands, such analysis “may be done through aerial photo analysis and on-the-ground observation,” but notes in conclusory fashion that a complete assessment of vegetative cover on the private lands would be prohibitively expensive.³⁴ Even if an analysis of the entire Marietta unit is too costly, this says nothing about whether such analysis can be done for the specific parcels offered in the December lease sale, or whether this analysis would even be done at the application for permit to drill (“APD”) stage. Moreover, given the lack of existing information about baseline vegetation conditions, the severity of harm that oil and gas development could have on vegetation on private surface and suitable habitat for the Indiana bat is “highly uncertain,” which requires preparation of an EIS. 40 C.F.R. § 1508.27(b)(5) (EIS must be prepared when an action’s effects are “highly uncertain or involve unique or unknown risks”); *see also Nat’l Parks & Conservation Ass’n v. Babbitt*, 241 F.3d 722, 732 (9th Cir. 2001) (preparation of EIS “mandated where uncertainty may be resolved by further collection of data” or where the collection of such data may prevent speculation on potential effects).

The EA includes a general discussion of potential loss of forest vegetation, such as in the oak-hickory and pine forests, from oil and gas development. The decline of oak-hickory in forest communities is not favorable for the endangered Indiana bat because oak-hickory species possess exfoliating bark, which makes the oak-hickory species suitable for roosting.³⁵ The EA, however, summarily dismisses these losses, concluding that vegetation loss associated with potential future oil and gas development would not be expected to adversely affect the sustainability of oak-hickory forest areas in the Marietta Unit “overall” because “[t]he 2006 Forest Plan goal for herbaceous or shrubby habitat in the Diverse Continuous Forest Management Area is 2 to 4%; an APD may not be approved that threatens to create open habitat in excess of that goal.”³⁶ However, this does not account for vegetation loss associated with potential future oil and gas development of private mineral and private lands; Forest Plan goals do not apply to private surface. Indeed, the Final EA notes that “[e]ach separate private landowner would be responsible for setting the terms for land clearing and reclamation,”³⁷ suggesting that no regulatory agency would prevent Indiana bat habitat from being destroyed or would require it to be reclaimed.

Moreover, the EA’s discussion of lease stipulations that target particular species that may be taken at the APD stage, fails to discuss whether these protections would apply to private lands. Numerous habitat and species protections that apply to federal surface do not apply to private lands. For example:

- Forest Plan Stipulations pertaining to species-related mitigation measures, e.g., Stipulation 10, 12, 13, and 14, are not reflected in state laws. There are no provisions in the state oil and gas laws that require, for example, species reviews, surveys, or other species-related mitigation measures.

³⁴ Final EA at 96.

³⁵ USDA Forest Service. Final Environmental Impact Statement for the Wayne National Forest 2006 Land and Resource Management Plan Appendix F1 Final Biological Assessment at F1-46.

³⁶ Final EA at 97.

³⁷ Final EA at 96.

- The Forest Plan requires “closed systems” for storing wastewater instead of wastewater ponds and prohibits netting, to protect the ESA-listed Indiana bat.³⁸ However, Ohio law allows wastewater pits to remain in operation throughout the producing life of a well, so long as standing wastewater is drained and removed at least every 180 days.³⁹ Ohio law does not prohibit the screening or netting of these pits.
- Forest Plan Stipulation 15, “Controlled Surface Use – Riparian areas,” allows Forest Service to impose occupancy conditions to protect riparian areas in the Wayne. However, this stipulation is not reflected in state law and therefore would not apply to riparian areas on private surface. Ohio law contains only the waivable requirement that new wells and tank batteries not be located within fifty feet of a water body.⁴⁰
- Ohio law does not require safety valves at stream crossings for gathering pipelines, in contrast to Forest Plan protections.⁴¹

The EA should have, but failed, to discuss the impacts of private surface activities on sensitive bat species and their habitat.

c. The EA Fails to Consider Private Land-Use Changes

The EA notes that “future mineral development would lead to construction of well pads, roads, and other supporting infrastructure.”⁴² Although these potential land use changes on federal land are required to be in conformance with “desired management objectives (such as vegetation and species) identified in the 2006 Forest Plan,” the same cannot be said of private land, which would only need to be in conformance with “local planning and zoning requirements.”⁴³ The EA does not analyze baseline private land use conditions surrounding the areas for lease (or even identify the specific areas available for leasing),⁴⁴ or consider the potential for private land-use changes, even though it is apparent that private oil and gas developers are eager to acquire federal minerals so that they can develop their private minerals, and are more likely to do so on private land.

³⁸ 2012 Supplemental Information Report (“SIR”) at 47.

³⁹ Ohio Administrative Code (“OAC”) 1501:9-3-08(A).

⁴⁰ Ohio Revised Code (“ORC”) 1509.021(L): “The location of a new well or a new tank battery of a well shall not be within fifty feet of a stream, river, watercourse, water well, pond, lake, or other body of water.”

⁴¹ 2012 SIR at 40 (noting SFW-ARR-17, which requires “appropriate technology on all pipelines that cross streams so that supply and flow can be shut off upon detection of a leak”).

⁴² Final EA at 81.

⁴³ Final EA at 81.

⁴⁴ Conservation Groups have put together their own map using data provided by the Forest Service to show where all 40,000 acres in the Marietta Unit potentially available for leasing are located. *See* Center Parcel Map (2017). According to Forest Service staff, this acreage could include minerals reserved by the private owner when the surface rights were transferred to federal ownership. If and when those reservations expire, they could eventually come under federal ownership. These minerals are considered federal minerals that could be leased in BLM’s EA.

d. The EA Lacks Adequate Analysis of Surface Water and Groundwater Impacts

The EA is unclear regarding BLM's authority to mitigate surface water impacts of private surface development that would reach federal minerals. For example, the EA states that if some development were to occur on privately owned surface, "federal and state regulations do exist in order to address any potential concerns regarding contamination or spills. However, if the development occurs on private lands and pipelines or well development reaches federal minerals, the BLM would ensure that the construction of such well is in compliance with all applicable safety standards."⁴⁵ But the EA never actually identifies what authority BLM has over pipelines that reach federal minerals or well pads on private surface, or pipelines crossing private surface; nor does the EA identify which federal and state regulations would apply to spills.

The EA also mentions that the "BLM and Forest Service would not approve water withdrawals that would draw down a surface waterbody to the extent that aquatic life would be measurably adversely impacted, for example, by dewatering a stream enough to entrap fish or expose mussels to dry conditions in a stream that would normally have perennial flow."⁴⁶ Again, it is unclear what requirement or binding commitment prohibits BLM from disapproving such activities, and whether this requirement would apply to wells developed on private surface where they accessed federal minerals. As for the Forest Service, it can only prohibit water depletions from streams on Forest Service lands.⁴⁷ Indeed, "[t]here is no agency (federal or state) that regulates water withdrawals from streams and rivers in the State of Ohio."⁴⁸ Thus, the only limits on an operator's ability to withdraw water from private surface would be the private landowner's consent.⁴⁹

The 2012 SIR assumes that the Forest Plan's prohibition on wastewater injection disposal would avoid the impacts of wastewater contamination. Again, this rule would not prohibit wastewater injection on private surface or outside the Wayne. Indeed, wastewater injection is already occurring on private surface within the Marietta Unit,⁵⁰ which could impact adjacent federal lands. Gaps in Ohio's regulation of wastewater injection could put surface and groundwater resources at risk.⁵¹ For example, Ohio does not require monitoring of groundwater quality near injection wells or testing or disclosure of chemicals in waste before injecting it underground.⁵²

BLM's failure to analyze the impacts of private surface development, or consider and analyze mitigation for private surface activities, violates NEPA, which requires discussion of all

⁴⁵ Final EA at 27.

⁴⁶ Final EA at 105.

⁴⁷ See 2012 SIR at 29-30.

⁴⁸ 2012 SIR at 29.

⁴⁹ See *id.* 29-30.

⁵⁰ FracTracker Injection Well Map, *available at*

<http://maps.fractracker.org/3.13/?appid=2a68b20a338f464da12d6e8f1cb66c08&webmap=0f6bdbb82b1246f6a2d2d7a6c4c3bb74>.

⁵¹ Steinzor, Nadia & Bruce Baizel, Earthworks. Wasting away: Four states' failure to manage gas and oil field waste from the Marcellus and Utica Shale at 46-51 (April 2015), available at <https://www.earthworksaction.org/files/publications/WastingAway-FINAL-lowres.pdf> (providing overview of Ohio waste disposal problems) ("Steinzor 2015").

⁵² *Id.* at 35-36.

indirect effects that are reasonably foreseeable, 40 C.F.R. § 1508.8, and of connected actions and cumulative impacts. *Id.* at § 1508.7 (cumulative impacts are impacts of “other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.”); *id.* at § 1508.25(a) (actions are connected if they “[c]annot or will not proceed unless other actions are taken previously or simultaneously”); see also *Grand Canyon Trust v. FAA*, 290 F.3d 339, 342 (D.C. Cir. 2002) (EA “must give a realistic evaluation of the total impacts and cannot isolate a proposed project, viewing it in a vacuum”). BLM’s failure to prepare an EIS without adequate assurances that the effects of increased private disturbance will be avoided or mitigated to less-than-significant levels also violates NEPA. The EA Bases Its Finding of No Significant Impacts on Inaccurate Estimates of Surface Disturbance for Well Pads, Compressor Stations, and Gathering Lines, in Violation of NEPA.

The EA’s surface impact footprint estimates for well pad sites, compressor station sites, and gathering lines are significantly lower than empirical field data suggests, thereby precluding a complete disclosure and analysis of soil, water quality, vegetation, and wildlife impacts.

Gathering lines, which transport natural gas from the well to a central collection point, are the single largest source of surface disturbance associated with oil and gas development, yet neither the EA nor the underlying NEPA documentation account for their surface disturbance. The 2004 RFDS and 2012 SIR dismiss this class of impact out of hand, stating: “Given the long history of gas production in the WNF, there is already a well developed pipeline infrastructure in place which should minimize the need for lengthy gathering lines to service new wells.”⁵³

The EA offers a mere two passing statements on the subject of pipeline construction, stating only: “If the well produces natural gas, and the flowline is in the road, another 0.5 acres may be affected by flowline construction. ... If the well is productive, additional land may be affected by pipeline construction.”⁵⁴ The EA fails to elaborate on these statements, or quantify how much pipeline construction could result from a productive well.

This cursory treatment of gathering lines is wholly improper, particularly in light of ample evidence that gathering lines for horizontal well operations result in significant land clearing. According to one source, over two-thirds of the surface disturbance caused by horizontal well development in the Marcellus shale region, or about 19 acres per well pad site, is caused by the construction of gathering pipelines.⁵⁵ Similarly, an analysis of 122 horizontal well pads in Eastern Ohio found an average of over 17 acres of direct pipeline disturbance per well pad.⁵⁶ And separate, ongoing research in Eastern Ohio has found approximately 8.5 acres of

⁵³ 2012 SIR, Appendix B at 7.

⁵⁴ Final EA at 26.

⁵⁵ The Nature Conservancy, Land Use and Ecological Impacts from Shale Development in the Appalachians, Summary Statement for DOE Quadrennial Energy Review Public Stakeholder Meeting Pittsburgh, PA July 21, 2014, available at http://energy.gov/sites/prod/files/2014/07/f17/pittsburg_qermeeting_minney_statement.pdf; see also Slonecker, E.T. et al., Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004–2010: USGS Open-File Report 2012–1154 at 26 (2012), available at <https://pubs.usgs.gov/of/2012/1154/of2012-1154.pdf> (“Pipeline construction was the source of most of the increase in forest patch number.”) (“Slonecker 2012”).

⁵⁶ See McClaugherty, Charles et al., Landscape Impacts of Infrastructure Associated with Utica Shale Oil and Gas Extraction in Eastern Ohio, 100th ESA Annual Meeting (Aug. 9-14, 2015), abstract available at http://esa.org/meetings_archive/2015/webprogram/Paper52636.html (873 ha of pipeline divided by 122 well pad

gathering line clearing for *every acre* of well pad; in areas with relatively low well pad density, ratios have averaged up to 14:1.⁵⁷

Moreover, contrary to the EA's suggestion, it is unlikely that existing gathering line infrastructure on the Wayne could support future horizontal operations. Field studies conducted by The Nature Conservancy show that "the supporting [horizontal well] infrastructure is much larger in scale (24" diameter pipelines to gather gas from wells versus 2" or 4" pipelines in shallow fields)."⁵⁸ In the Marcellus region, gathering lines may range from 6 to 24 inches in diameter and may clear rights-of-way of 30 to 150 feet wide.⁵⁹ These are much larger than gathering lines used in shallow gas fields, which generally range from 2 to 6 inches in diameter.⁶⁰ Moreover, photographic documentation of fracking activities on private surface within the administrative boundary of the Marietta Unit shows that in many instances large swaths of forested land are being razed for the construction and burial of gathering lines.⁶¹

Another oversight of the 2012 SIR's horizontal well site disturbance estimates is the apparent failure to account for "Limits of Disturbance" (LOD) for each well pad, i.e., the clearing and earth-moving impacts that occur immediately adjacent to the pad itself, not including access roads, gathering lines, and transmission lines. The 2012 SIR estimates that horizontal well pad sites average a total of 3-5.5 acres of disturbance during construction and prior to reclamation, and 0.68-1.38 acres during the production phase, after reclamation.⁶² A review of 122 horizontal wells in East-Central Ohio, however, revealed that surface disturbance for LOD *alone* averaged 6.9 acres.⁶³ Ongoing research of 285 well pads in Eastern Ohio has found LODs of 10-14 acres per pad.⁶⁴

Furthermore, the 2012 SIR grossly underestimates surface disturbance for compressor stations at 1 to 5 acres.⁶⁵ Ongoing research in East-Central Ohio suggests that compressor station sites tend to range between 15 to 30 acres in size.⁶⁶ It is also not clear whether the 2012 SIR and 2006 EIS consider the surface footprints of freshwater or wastewater retention ponds. The

sites) ("McClagherty 2015").

⁵⁷ Information obtained from Ohio Environmental Council attorney Nathan Johnson's January 28, 2016 conversation with Ted Auch, PhD, The FracTracker Alliance, relating to his ongoing landscape impact research in East-Central Ohio in collaboration with Chuck McClagherty's lab at the University of Mt. Union (examining 285 well pads and associated infrastructure); *see also* Auch, Ted, FracTracker Alliance, Letter re Land-Use Footprint of High Volume Hydraulic Fracturing in Eastern Ohio (May 2016).

⁵⁸ Johnson, Nels, Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind, The Nature Conservancy – Pennsylvania Chapter and Pennsylvania Audubon at 9 (2010), available at http://www.nature.org/media/pa/tnc_energy_analysis.pdf ("Johnson 2010").

⁵⁹ Johnson, Nels, et al., Pennsylvania Energy Impacts Assessment, Report 2: Natural Gas Pipelines. The Nature Conservancy – Pennsylvania Chapter at 1 (2011), available at <http://www.nature.org/ourinitiatives/regions/northamerica/unitedstates/pennsylvania/ng-pipelines.pdf> ("Johnson 2011").

⁶⁰ *Id.*

⁶¹ Exhibit C ¶ 17 (citing Exs. F, G, H, I, J, K, L, and M attached thereto).

⁶² 2012 SIR at 4.

⁶³ McClagherty 2015.

⁶⁴ Auch Comm., *supra* n.57; *see also* Auch Letter, *supra* n.57.

⁶⁵ 2012 SIR at 2, Table 1.

⁶⁶ Auch Comm., *supra* n.57; *see also* Auch Letter, *supra* n.57.

enormous water use and wastewater generation associated with hydraulic fracturing and horizontal drilling could foreseeably result in the development of such ponds.

The EA's inaccurate surface disturbance analysis results in a failure to fully disclose and analyze the leasing proposal's significant effects on numerous resources, including water quality, scenic resources, vegetation, and wildlife. In particular, increased surface disturbance would exacerbate existing habitat fragmentation and edge effects on wildlife. In a recent review of 242 Marcellus well pads, researchers found "[w]ell pads occupy 3.1 acres on average while the associated infrastructure (roads, water impoundments, pipelines) takes up an additional 5.7 acres, or a total of nearly 9 acres per well pad."⁶⁷ This study found an average of 21 additional acres of edge effect disturbance, for an average of 30 acres total of both direct and indirect interior forest habitat loss per well pad.⁶⁸ Another study found that each mile of a 100-foot right-of-way directly disturbs 528,000 square feet or approximately 12 acres and creates an additional 72 acres of new forest edges.⁶⁹

A more highly fragmented forest landscape could have far-reaching effects not discussed in the EA. New open corridors inhibit the movement of some species, such as forest interior nesting birds, which are reluctant to cross openings where they are more exposed to predators.⁷⁰ Fragmentation effects from conventional oil and gas development on the Allegheny National Forest greatly reduced core forest habitat type and negatively impacted neotropical migrant songbird species, while benefitting less desirable species.⁷¹

The 2006 Forest Plan and EIS, 2012 SIR, and EA severely underestimate the potential surface impacts of well pad site development and associated infrastructure—both the immediate effects of land clearing and earthmoving, and the resulting surface runoff, industrialization, habitat fragmentation, edge effects, and species impacts, in violation of NEPA. *See* 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.24 (agency "shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements").

2. The EA Fails to Address a Host of Environmental Impacts Related to Fracking

The EA fails to mention or consider information on the environmental and public health risks of fracking.⁷² For example, the environmental and public health risks highlighted by the following studies must be considered, but were ignored:

⁶⁷ Johnson 2010 at 9-11.

⁶⁸ *Id.*

⁶⁹ Johnson 2011 at 5.

⁷⁰ *Id.* at 6; *see also* Slonecker 2012 at 2, available at <https://pubs.usgs.gov/of/2012/1154/of2012-1154.pdf> (noting fragmentation resulting in loss of migration corridors). 158 bird species inhabit the Wayne National Forest. *See* USFS, Watchable Wildlife, https://www.fs.usda.gov/detail/wayne/about-forest/?cid=fsm9_006107; *see also* USFS, About the Forest, https://www.fs.usda.gov/detailfull/wayne/about-forest/?cid=fsm9_006053.

⁷¹ Thomas, Emily H. et al. Conventional oil and gas development alters forest songbird communities, *The Journal of Wildlife Management*, 78 (2), 293-306, abstract available at DOI: [10.1002/jwmg.662](https://doi.org/10.1002/jwmg.662).

⁷² According to the U.S. Energy Information Administration, development of the Marcellus and Utica shale plays is a main driver of growth in total U.S. shale gas production. Fracking of these shale plays underlying the Wayne National Forest is therefore reasonably foreseeable. *See* USEIA, Annual Energy Outlook 2017, available at [https://www.eia.gov/outlooks/aeo/pdf/0383\(2017\).pdf](https://www.eia.gov/outlooks/aeo/pdf/0383(2017).pdf); USEIA Drilling Productivity Report For Key Tight Oil and Shale Gas Regions (April 2017), available at <https://www.eia.gov/petroleum/drilling/pdf/dpr-full.pdf>.

Risks to Drinking Water Sources

The EPA recently completed its study on the impacts of fracking on drinking water resources, which found scientific evidence that hydraulic fracturing activities can impact drinking water resources under some circumstances.⁷³ The report identifies certain conditions under which impacts from hydraulic fracturing activities can be more frequent or severe.⁷⁴ The EPA identified a number of risk factors that may increase the risks of drinking water contamination, all of which are present in the Wayne National Forest:

- **Risk factor 1:** Water withdrawals for hydraulic fracturing in times or areas of low water availability, particularly in areas with limited or declining groundwater resources.

The Wayne National Forest is an area of limited water resources in terms of both groundwater and surface waters, compared to the enormous water demands of fracking in the Utica and Marcellus shales. In Ohio, the average amount of water used in fracking has increased from 5.6 million gallons per well in 2011 to 7.6 million gallons in 2014.⁷⁵ FracTracker has found that “[f]or each lateral that is fractured in Ohio, ~6.6 million gallons of fresh water are needed, and this figure, too, is increasing by 1.6 million gallons per year. This trend equates to an increase of 7,777 gallons of water used for every extra foot the lateral is extended out into the ground.”⁷⁶ However, because “[t]here is no agency (federal or state) that regulates water withdrawals from streams and rivers in the State of Ohio,” the only limits on an operator’s ability to withdraw water would be landowner’s consent.⁷⁷ According to EPA, without management of the rate and timing of withdrawals, surface water withdrawals have the potential to affect both drinking water quantity and quality, especially in seasonal low-flow periods.⁷⁸ In Ohio’s Marcellus and Utica Shales, reuse of wastewater is uncommon.⁷⁹

- **Risk factor 2:** Spills during the handling of hydraulic fracturing fluids and chemicals or produced water that result in large volumes or high concentrations of chemicals reaching groundwater resources.

Enormous volumes of wastewater are produced in the completion of horizontal wells in Ohio, and major spills have occurred in the state. For example:

- In 2010, a fracturing flowback pit was cut by a track hoe in 2010, causing more than 1.5 million gallons of fluid to spill into the environment.⁸⁰

⁷³ USEPA, *Hydraulic Fracturing for Oil and Gas: Impacts from the Hydraulic Fracturing Water Cycle on Drinking Water Resources in the United States* (2016) (“USEPA 2016”).

⁷⁴ *See id.* at ES-3.

⁷⁵ Arenschiold, Laura. *Drillers Using more water to frack Ohio shale*, Columbus Dispatch (Feb. 8, 2016), available at <http://www.dispatch.com/content/stories/local/2016/02/07/drillers-using-more-water-to-frack-ohio-shale.html#>.

⁷⁶ Auch, Ted et al. *FracTracker Alliance, The Ultimate Price of PA State Forest Drilling* (Nov. 4, 2015), available at <https://www.fracktracker.org/2015/11/pa-state-forest-drilling/>.

⁷⁷ 2012 SIR at 29.

⁷⁸ EPA 2016 at 4-37.

⁷⁹ EPA 2016 at 4-36.

⁸⁰ ODNr, Notice of Violation No. 1278508985 (June 21, 2010).

- In 2008, the back wall of a pit in Ohio gave way, causing pit contents to spill and flow towards a creek.⁸¹
- In June 2014, the Statoil Eisenbarth well pad located in Monroe County, close to the proclamation boundary of the Marietta Unit, caught fire and took nearly a week to completely extinguish. “As a result of fire-fighting efforts and flow back from the well head, significant quantities of water and unknown quantities of products on the well pad left the Site and entered an unnamed tributary of Opossum Creek that ultimately discharges to the Ohio River.”⁸² The runoff killed approximately 70,000 fish in a 5-mile long fish kill. Opossum Creek, the location of the Eisenbarth fish kill, is partially located within the proclamation boundary of the Marietta Unit.

Frack chemicals and wastewaters may have chronic effects on aquatic organisms aside from immediate lethal effects, including endocrine-disrupting effects,⁸³ and impacts on microbial community structure and functioning in sediments and stream waters, altering nutrient cycling and antibiotic resistance.⁸⁴

A new study analyzing spill records in several states (Colorado, New Mexico, North Dakota, and Pennsylvania) show spills are a chronic risk of oil and gas development: 2-16% of wells report a spill each year, while 75-94% of spills occur within the first three years of well life when wells were drilled, completed, and had their largest production volumes.⁸⁵ According to another nationwide review of oil and gas spills since 2009, 2,500 spills have been reported to have affected groundwater, but this is likely an undercount as many oil and gas agencies don’t track whether spills affect water, or even spills.⁸⁶ Overall, 10,348 spills, blowouts and other mishaps at oil and gas sites occurred in 2015; 11,283 such events occurred in 2014.⁸⁷ At least 76 spills occurred in Ohio in 2015, 43 of which affected water resources.⁸⁸

⁸¹ ODNR, Notice of Violation No. 2016754140 (May 16, 2008).

⁸² See, e.g., U.S. Environmental Protection Agency Pollution/Situation Report, Statoil Eisenbarth Well Response, POLREP #1, available at <http://www.theoec.org/sites/default/files/Eisenbarth%20well%20pad%20fire.pdf>; Junkins, Casey, *EPA: 70K Fish, Aquatic Life Killed*, *Wheeling Intelligencer*, July 22, 2014, available at <http://www.theintelligencer.net/page/content.detail/id/607167.html>; Ohio Environmental Protection Agency, Directors Final Findings & Orders NPDES In the Matter of Statoil USA Onshore Properties, Inc. (November 6, 2015).

⁸³ He, Yuhe, et al., Effects on Biotransformation, Oxidative Stress, and Endocrine Disruption in Rainbow Trout (*Oncorhynchus mykiss*) Exposed to Hydraulic Fracturing Flowback and Produced Water, *Environ. Sci. Technol.*, (2017) 51, 940–947, doi: 10.1021/acs.est.6b04695.

⁸⁴ Fahrenfeld, N.L., Shifts in microbial community structure and function in surface waters impacted by unconventional oil and gas wastewater revealed by metagenomics, *Science of the Total Environment*, 580 (2017) 1205–1213, <http://dx.doi.org/10.1016/j.scitotenv.2016.12.079>.

⁸⁵ Patterson, Lauren A. et al. Unconventional Oil and Gas Spills: Risks Mitigation Priorities, and State Reporting Requirements, *Environ. Sci. Technol.*, 51(5), pp 2563–2573 (2017), doi: 10.1021/acs.est.6b05749.

⁸⁶ Soraghan, Mike & Pamela King, Drilling mishaps damage water in hundreds of cases, *Energywire* (Aug. 8, 2016), available at <https://www.eenews.net/stories/1060041279>.

⁸⁷ *Id.*

⁸⁸ *Id.*

Recently, in Pennsylvania, a shale gas driller was fined \$1.2 million when a wastewater impoundment leaked and contaminated the drinking water of five Westmoreland County families.⁸⁹ The families are still without adequate, permanent water supplies and still depend on bottled water.

One of the parcels offered in the December lease sale, OHES 058311, is within the Little Muskingum River Basin, which contains exceptionally high-quality surface waters important for aquatic species.⁹⁰

- **Risk factor 3:** Injection of hydraulic fracturing fluids into wells with inadequate mechanical integrity, allowing gases or liquids to move to groundwater resources.

Ohio only recommends monthly monitoring of “mechanical integrity” of Class II wastewater injection wells unless doing so is “not feasible” for operators.⁹¹ In 2007, a frack well with insufficient and improperly placed cement led to contamination of 26 drinking water wells in Brainbridge Township, Ohio.⁹²

- **Risk factor 4:** Injection of hydraulic fracturing fluids directly into groundwater resources.

An EPA report has singled out Ohio for not requiring operators disposing of waste to reveal its chemical content, increasing the risk of groundwater contamination by harmful chemicals.⁹³

- **Risk factor 5:** Discharge of inadequately treated hydraulic fracturing wastewater to surface water.

Ohio Revised Code 1509.22 allows facilities to “store,” “recycle,” “treat,” “process,” and “dispose” of oil and gas wastewater if done pursuant to a permit or order granted by the Ohio Division of Oil & Gas Resources Management (DOGRM). Although this statute directs DOGRM to adopt rules governing the aforesaid activities, the state of Ohio has never adopted the applicable rules. As a result, the discharge or disposal of recycled, treated, or processed oil and gas wastewater is not subject to any enumerated state standards or prohibitions. Nor are there any applicable state standards governing

⁸⁹ Hopey, Don, Shale gas driller fined \$1.2M for contaminating drinking water in Westmoreland, Pittsburgh Post-Gazette (Feb. 28, 2017), available at <http://www.post-gazette.com/local/westmoreland/2017/02/28/WPX-Energy-Appalachia-shale-gas-company-fined-Pennsylvania-water-contamination-Westmoreland-County/stories/201702280305>.

⁹⁰ Exhibit B (citing Ex. A attached thereto); Ohio EPA, Beneficial Use Support Document Little Muskingum River Basin (2016), available at <http://epa.ohio.gov/Portals/35/rules/Little%20Musky.pdf>.

⁹¹ Steinzor, Nadia & Bruce Baizel, Earthworks. Wasting away: Four states’ failure to manage gas and oil field waste from the Marcellus and Utica Shale (April 2015), 34, available at <https://www.earthworksaction.org/files/publications/WastingAway-FINAL-lowres.pdf>.

⁹² USEPA 2016 at 6-28.

⁹³ *Id.* at 36.

treatment methods, volumes, or chemical parameters applicable to recycled, treated, or processed wastewater.

Moreover, Ohio Revised Code 1509.226 allows Ohio political subdivisions to authorize the discharge of oil and gas wastewater on local roadways for dust and ice control purposes. Runoff of this wastewater could potentially contaminate surface waters.

- **Risk factor 6:** Disposal or storage of hydraulic fracturing wastewater in unlined pits resulting in contamination of groundwater resources.

Ohio does not have specific standards for pits, requiring only that they “prevent the escape” of waste substances. *See* ORC § 1509.22(C)(2).⁹⁴ Pit liners are not required.⁹⁵ Between 1983 and 2007, 63 incidents of spills contaminating groundwater were caused by leaks from unlined pits.⁹⁶ Improper construction or maintenance of production pits was the primary cause of groundwater contamination, accounting for nearly 44% (63) of all documented contamination incidents.⁹⁷

Public Health Risks

Due to the frequent and heavy use of chemicals in fracking operations, proximity to fracked wells is associated with higher rates of cancer, birth defects, poor infant health, and acute health effects for nearby residents who must endure long-term exposure:

- In one study, residents living within one-half mile of a fracked well were significantly more likely to develop cancer than those who live more than one-half mile away, with exposure to benzene being the most significant risk.⁹⁸
- A new study shows a link between proximity to oil and gas development and childhood leukemia. Researchers found children diagnosed with acute lymphocytic leukemia were more likely to live in areas of high-density oil and gas development compared to children with other types of cancer.⁹⁹
- Another study found that pregnant women living within 10 miles of a fracked well were more likely to bear children with congenital heart defects and possibly neural tube defects.¹⁰⁰ A separate study independently found the same pattern; infants born near fracked gas wells had more health problems than infants born near sites that had not yet conducted fracking.^{101, 102} The study analyzed birth records from 2004 to 2011 to assess

⁹⁴ Steinzor 2015 at 16.

⁹⁵ Richardson, Nathan, *The State of State Shale Gas Regulation, Resources for the Future*, 51 (June 2013).

⁹⁶ USEPA 2016 at 8-44.

⁹⁷ Steinzor 2015 at 14.

⁹⁸ McKenzie, L. et al., *Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources*, 424 *Science of the Total Environment* 79 (2012) (“McKenzie 2012”).

⁹⁹ McKenzie, Lisa M., et al., *Childhood hematologic cancer and residential proximity to oil and gas development*, *PLoS ONE* 12(2): e0170423 (2017), <http://dx.doi.org/10.1371/journal.pone.0170423>.

¹⁰⁰ McKenzie, L. et al., *Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado*, *Advance Publication Environmental Health Perspectives* (Jan. 28, 2014), <http://dx.doi.org/10.1289/ehp.1306722> (“McKenzie 2014”).

¹⁰¹ Hill, Elaine L., *Unconventional Natural Gas Development and Infant Health: Evidence from Pennsylvania*,

the health of infants born within a 2.5-kilometer radius of natural-gas fracking sites. They found that proximity to fracking increased the likelihood of low birth weight by more than half, from about 5.6 percent to more than 9 percent.¹⁰³ The chances of a low Apgar score, a summary measure of the health of newborn children, roughly doubled, to more than 5 percent.¹⁰⁴

- Another recent Pennsylvania study found a correlation between proximity to unconventional gas drilling and higher incidence of lower birth weight and small-for-gestational-age babies.¹⁰⁵
- A recent study found increased rates of cardiology-patient hospitalizations in zip codes with greater number of unconventional oil and gas wells and higher well density in Pennsylvania.¹⁰⁶ The results suggested that if a zip code went from having zero wells to well density greater than 0.79 wells/km², the number of cardiology-patient hospitalizations per 100 people (or “cardiology inpatient prevalence rate”) in that zip code would increase by 27%. If a zip code went from having zero wells to a well density of 0.17 to 0.79 wells/km², a 14% increase in cardiology inpatient prevalence rates would be expected. Further, higher rates of neurology-patient hospitalizations were correlated with zip codes with higher well density.
- A new study found that prenatal exposure of female mice to chemicals associated with fracking and unconventional oil and gas development had adverse effects on reproductive and developmental health, including altered hormone levels, increased body weights, altered uterine and ovary weights, increased heart weights and collagen deposition, disrupted development of ovary follicles, and other adverse health effects. Even the lowest dosage exposures—equivalent to concentrations reported in drinking water sources in drilling regions—caused adverse health effects.¹⁰⁷
- Recently published reports indicate that people living in proximity to fracked gas wells commonly report skin rashes and irritation, nausea or vomiting, headache, dizziness, eye irritation and throat irritation.¹⁰⁸

Cornell University (2012).

¹⁰² Whitehouse, Mark, *Study Shows Fracking is Bad for Babies*, Bloomberg View, Jan. 4, 2014, available at <http://www.bloombergview.com/articles/2014-01-04/study-shows-fracking-is-bad-for-babies>.

¹⁰³ *Id.*, citing Janet Currie of Princeton University, Katherine Meckel of Columbia University, and John Deutch and Michael Greenstone of the Massachusetts Institute of Technology.

¹⁰⁴ *Id.*

¹⁰⁵ Stacy, Shaina L. et al. (2015) Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania. *PLoS ONE* 10(6): e0126425. doi:10.1371/journal.pone.0126425, available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0126425>.

¹⁰⁶ Jemielital, T. et al. Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. *PLoS ONE* 10(7): e0131093, available at <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0131093>.

¹⁰⁷ Kassotis, Christopher D., et al., Adverse Reproductive and Developmental Health Outcomes Following Prenatal Exposure to a Hydraulic Fracturing Chemical Mixture in Female C57Bl/6 Mice, *Endocrinology*, 157(9):3469–3481 (2016), doi: 10.1210/en.2016-1242.

¹⁰⁸ Rabinowitz, P.M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania. *Environmental Health Perspectives Advance Publication* (2014); Bamberger, Michelle and R.E. Oswald, Impacts of Gas Drilling on Human and Animal Health, *22 New Solutions* 51 (2012); Steinzor, N. et al., Gas Patch Roulette: How Shale Development Risks Public Health in Pennsylvania,

- A survey found agreement among experts that a minimum setback of a quarter mile from oil and gas development is necessary to protect public health.¹⁰⁹ Half of the experts recommended a 1 to 1 ¼ mile setback. The panel also agreed that additional protections are necessary for vulnerable populations such as children and the elderly.¹¹⁰
- In Texas, a jury awarded nearly \$3 million to a family who lived near a well that was hydraulically fractured.¹¹¹ The family complained that they experienced migraines, rashes, dizziness, nausea and chronic nosebleeds. Medical tests showed one of the plaintiffs had more than 20 toxic chemicals in her bloodstream.¹¹² Air samples around their home also showed the presence of BTEX — benzene, toluene, ethylbenzene and xylene — colorless but toxic chemicals typically found in petroleum products.¹¹³

Given these known health risks the EA should have, but fails to, analyze site-specific impact on towns and municipalities located near the proposed parcels. Specifically, the EA should have analyzed public health impacts to residents of Paden City, which is located less than four miles from parcel OHES 058308, and less than six miles from parcels the remaining parcels.¹¹⁴

Seismic Risks

New studies have shown that fracking and not just wastewater injections can induce earthquakes. Induced seismicity has been linked to fracking events in Ohio, Oklahoma, and Canada.¹¹⁵ Indeed, a 2015 study showed that 77 earthquakes occurring in March 2014 near Youngstown, Ohio triggered a microfault previously unknown to operators and regulators, including a magnitude 3.0 earthquake.¹¹⁶ The EA lacks any meaningful discussion of these risks, especially given that the locations of deep, active faults in Ohio are unknown. According to the Ohio Department of Natural Resources:

Earthworks Gas & Oil Accountability Project (2012).

¹⁰⁹ Brown, David et al. The Problem of Setback Distance for Unconventional Oil & Gas Development: An analysis of expert opinions. Southwest Pennsylvania Environmental Health Project Technical Reports, Issue 2 (May 9, 2016).

¹¹⁰ *Id.*; see also Webb, Ellen et al. Potential hazards of air pollutant emissions from unconventional oil and natural gas operations on the respiratory health of children and infants, Review Env'tl. Health 2016, available at http://ecowatch.com/wp-content/uploads/2016/05/fracking_study.pdf (suggesting greater protection from unconventional oil and gas development necessary for children and infants).

¹¹¹ *Parr v. Aruba Petroleum, Inc.*, Case No. 11-01650-E (Dallas Cty., filed Sept. 13, 2013).

¹¹² Deam, Jenny, *Jury Awards Texas family Nearly \$3 million in Fracking Case*, Los Angeles Times (Apr. 3, 2014) <http://www.latimes.com/nation/la-na-fracking-lawsuit-20140424-story.html>.

¹¹³ *Id.*

¹¹⁴ Center Parcel Map; (also available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>)

¹¹⁵ Arenschiold, Laura, Study ties 77 Ohio earthquakes to two fracking wells, Columbus Dispatch (Jan. 8, 2015) (“Arenschiold 2015”), available at <http://www.dispatch.com/content/stories/local/2015/01/08/Research-ties-Ohio-quakes-to-fracking.html>; Skoumal, Richard, et al., Earthquakes Induced by Hydraulic Fracturing in Poland Township, Ohio (2015), available at <http://www.bssaonline.org/content/early/2015/01/01/0120140168.abstract>; Soraghan, Mike, Okla. officials link some quakes to fracking, E&E News Energywire (Dec. 12, 2016), available at <http://www.eenews.net/energywire/stories/1060047006/>; Gronewold, Nathaniel, New research suggests fracking triggered active faults, E&E News Energywire (November 28, 2016), available at <http://www.eenews.net/energywire/stories/1060046240/>.

¹¹⁶ Arenschiold 2015.

The origins of Ohio earthquakes, as with earthquakes throughout the eastern United States, are poorly understood. Those in Ohio appear to be associated with ancient zones of weakness in the Earth's crust that formed during rifting and continental collision events about a billion years ago. These zones are characterized by deeply buried and poorly known faults, some of which serve as the sites for periodic release of strain that is constantly building up in the North American continental plate due to continuous movement of the tectonic plates that make up the Earth's crust.¹¹⁷

On April 2, 2017, a 3.0 earthquake occurred in the Marietta Unit of the Wayne National Forest near Graysville, a site within five miles of eight Utica shale fracking sites.¹¹⁸ This area of southeastern Ohio does not have a long history of earthquake activity.¹¹⁹ Fracking operations within the vicinity of the earthquake's epicenter were suspended, and Ohio Department of Natural Resources is investigating whether fracking may have caused the earthquake. BLM must analyze the potential for increased fracking and wastewater disposal in this area to cause seismic activity and mitigation measures to reduce these risks.

Vegetation and Soil Impacts

Razing large areas of the forest will be required to allow the development of well pads, pipelines, compressor stations, roads, and wastewater pits. Such land-clearing could also involve the removal of mountaintops or hilltops in the highly rugged and hilly landscape of the Marietta Unit, and the clearing of steep slopes for the construction and burial of gathering lines connecting hilltop wellpads to compressor stations and other centralized distribution points. These practices have recently been documented on private surface in the Marietta Unit,¹²⁰ and could result in landslides, erosion, and runoff pollution and sedimentation. Such risks have never been addressed or analyzed in the EA, 2012 SIR, or 2006 Forest Plan EIS. It is also unclear where operators would store or dispose mountaintop-removal waste—mountaintop-removal waste from coal mining is commonly dumped into streams in Appalachia.

The EA must address the unique risks and impacts of fracking but fails to do so. *See Hayes v. Chaparral Energy, LLC*, 180 F. Supp. 3d 902, *28-*29 (N.D. Okla. 2016) (failure to address impacts of fracking in EA violated NEPA), *vacated as moot by Hayes v. Osage Minerals Council*, No. 16-5060, 2017 U.S. App. LEXIS 11780 (10th Cir. June 30, 2017). Further, BLM cannot tier to a non-NEPA document—the 2012 SIR—for discussion of these impacts. 40 C.F.R. § 1508.28 (noting that tiering under NEPA is appropriate only when the initial broader analysis is found in an EIS). BLM's failure to prepare an EIS regarding these serious impacts to public

¹¹⁷ <http://geosurvey.ohiodnr.gov/earthquakes-ohioseis/seismic-risk-in-ohio>

¹¹⁸ Renault, Marion, Ohio investigates cause of weekend earthquake in drilling region, Columbus Dispatch (April 4, 2017) ("Renault 2017"), available at <http://www.dispatch.com/news/20170404/ohio-investigates-cause-of-weekend-earthquake-in-drilling-region>; see also Center for Biological Diversity, Parcel Map (2017).

¹¹⁹ Renault 2017.

¹²⁰ Exhibit C ¶ 15 (citing Exs. B & C attached thereto).

health and safety and Wayne National Forest resources also violates NEPA. Courts have recognized that fracking poses unique risks that warrant supplemental analysis in an EIS. *See Ctr. for Biological Diversity v. BLM*, 937 F. Supp. 2d 1140, 1157-59 (N.D. Cal. 2013); *Los Padres ForestWatch v. United States BLM*, 2016 U.S. Dist. LEXIS 138782, *33-*35 (C.D. Cal. Sept. 6, 2016). Indeed, recently, both the Texas National Forests and the Los Padres National Forest in southern California halted new oil and gas leasing in the forests to address concerns about fracking in supplemental environmental reviews.¹²¹ BLM's failure to analyze the unique risks and impacts of fracking and prepare an EIS is arbitrary and capricious.

3. BLM Failed to Adequately Address Potential Impacts to Threatened and Endangered Species, as Required by NEPA

BLM failed to adequately address in the EA the potential impacts from the proposed oil and gas leasing on species that are federally designated as threatened or endangered with extinction, including the Indiana bat, Northern long-eared bat, fanshell, pink mucket pearly mussel, sheepnose mussel, and snuffbox mussel.

In determining whether NEPA requires an EIS for a proposed action, agencies must consider the degree to which the action may adversely affect threatened or endangered species, or their critical habitat. 40 C.F.R. § 1508.27(b)(9). The EA failed to provide the required hard look at the potential impacts to listed species and their habitat.

a. The EA Does Not Properly Document Baseline Conditions for Species Within the Areas for Lease

In order to properly assess the potential environmental impacts of a proposed action, it is first necessary to assess the affected environment. *See* 40 C.F.R. § 1502.15. It remains unclear, however, whether surveys for the Indiana bat, Northern long-eared bat, and other threatened and endangered species and their habitat have been performed on the Marietta Unit. The EA only indicates that BLM “conducted site visits on October 26 and 27, 2015 within portions of the Marietta Unit that have already been requested for leasing to document the physical characteristics of the area and collect information on baseline conditions.”¹²² These limited visits on “portions” of the areas that have “already been requested for leasing” do not provide a sufficient basis to document baseline conditions and identify issues of concern for all areas of the Marietta Unit in which leasing is proposed. Indeed, it is entirely unclear where all 40,000 acres that could be leased are located in the Marietta Unit, as the EA does not provide any maps or description of these locations.

¹²¹ U.S. Forest Service, Letter to U.S. Fish & Wildlife Service Re Los Padres National Forest Leasing & Enclosure (U.S. Forest Letter to BLM) (Nov. 18, 2016) (“The Forest Service’s 2005 ROD and FEIS...did not address environmental impacts of fracking.... I believe that voluntary supplementation of our environmental analysis to address fracking would further the purposes of the National Environmental Policy Act”); U.S. Forest Service, Letter to BLM Re Texas National Forests (withdrawing consent to new leasing in Texas National Forests in light of “environmental concerns surrounding the offering of 31,169.19 acres of land for oil and gas leasing” and noting Forest Service “wishes to evaluate these concerns to see whether changes are warranted to either the availability of these parcels for leasing or the conditions of surface occupancy”) (Feb. 18, 2016).

¹²² Final EA at 19.

Without performing such surveys in advance, appropriate stipulations for the protection of sensitive wildlife (or other resources) may be lacking, and it may be too late to include them when site-specific drilling is proposed. Under BLM's interpretation of its regulations, absent a no surface occupancy stipulation, a lessee cannot be prohibited entirely "from surface use of the leased parcel once its lease is final." See *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 718 (10th Cir. 2009) (citing 43 C.F.R. § 3101.1-2 ["A lessee shall have the right to use so much of the leased lands as is necessary to explore for, drill for, mine, extract, remove and dispose of all the leased resource in a leasehold subject to: Stipulations attached to the lease . . . [and other] reasonable measures . . ."]); see also BLM Handbook H-1624-1 ("By law, these impacts [from oil and gas development] must be analyzed before the agency makes an irreversible commitment. In the fluid minerals program, this commitment occurs at the point of lease issuance.").

b. The EA Fails to Adequately Analyze Impacts to the Indiana Bat

BLM acknowledges in the EA that the Indiana bat "is well-documented on all units of the [Wayne National Forest] and is present year-around."¹²³ Moreover, BLM acknowledges that oil and gas activities "are likely to adversely affect Indiana bat."¹²⁴ The EA, however, devotes only three sentences to address the potential impacts of the proposed action on this endangered species.¹²⁵ Remarkably, BLM neglects to even mention white-nose syndrome, which is widely recognized as the greatest threat to the Indiana bat. As recognized by the Forest Service, "[w]hite-nose syndrome has caused extremely high mortality in six bat species, including the endangered Indiana bat."¹²⁶ BLM also neglects to mention how climate change may impact the habitat for the Indiana bat. Climate change is expected to result in increasing temperatures throughout the Midwest, which would impact the temperature-sensitive Indiana bat.¹²⁷

Finally the EA also fails to discuss or analyze the dramatic reductions in Indiana bat populations documented by the FWS in the recently released 2017 Indian Bat (*Myotis sodalist*) Population Status Update.¹²⁸ The Status Update provides an overview of Indiana bat population trends over time by state and region. The Status Update shows a range-wide population decline of 3.5% from 2015-2017, the most recent review period.¹²⁹ Over that same time period Ohio has experienced a 39.9% decline in Indiana bat populations.¹³⁰ The Status Update also shows that Ohio is not the only state experiencing dramatic bat population decline; Vermont, West Virginia, and Tennessee have seen Indiana bat populations decline by 64%, 54%, and 48% respectively over the same time period.¹³¹ In fact, sixteen of the eighteen states studied have seen declines in

¹²³ Final EA at 48.

¹²⁴ *Id.* at 99.

¹²⁵ *Id.*

¹²⁶ U. S. Forest Service, Research and Development White Nose Syndrome <http://www.fs.fed.us/research/invasive-species/terrestrial-animals/white-nose-syndrome.php>

¹²⁷ Pryor, S. C., et al., Ch. 18: Midwest. Climate Change Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 418-440 (2014), doi:10.7930/J0J1012N; see also n.127 below & accompanying text.

¹²⁸ U.S. Fish and Wildlife Service, 2017 Indian Bat (*Myotis sodalist*) Population Status Update, (available at <https://www.fws.gov/Midwest/endangered/mammals/inba/pdf/2017IBatPopEstimate5July2017.pdf>). (Hereafter "Status Update").

¹²⁹ *Id.* at Table 3.

¹³⁰ *Id.*

¹³¹ *Id.*

Indiana bat populations from 2015-2017.¹³² The EA does not consider the recent dramatic decline in bat populations in Ohio over the last two years and therefore fails to adequately address the potential impacts of fracking to weakened Indiana bat populations as required by NEPA.

Without considering the impacts of the proposed action in the context of these critically important threats, along with the effects of private surface and private mineral development activities, BLM has failed to take the required hard look and its conclusion that the proposal will not have measurable negative impacts is unsupported.

c. The EA Fails to Adequately Analyze Impacts to the Northern Long-Eared Bat

According to the EA, the Marietta Unit “contains ample suitable foraging and roosting habitat” for the northern long-eared bat.¹³³ Unlike its analysis for the Indiana bat, BLM recognized in the EA that white-nose syndrome is the primary threat to the northern long-eared bat.¹³⁴ As with the Indiana bat, however, BLM failed to consider how climate change may already be impacting this species and its habitat.

In assessing potential impacts to the northern long-eared bat from the proposed action, BLM stated that tree removal may result in impacts to individuals.¹³⁵ BLM failed to consider, however, the significance of this loss of trees in the context of the ongoing threats from white-nose syndrome and climate change, as well as private surface development. Moreover, BLM failed to consider how the proposed leasing and drilling activities could fragment the bat’s remaining habitat for spring staging/fall swarming and foraging, disrupt breeding and foraging patterns, pollute and degrade the bat’s drinking water sources, and result in death traps for bats in the form of wastewater pits.

d. The EA Fails to Adequately Analyze Impacts from Water Depletion, Surface Disturbance, and Toxic Spills From Horizontal Drilling that Will Harm Aquatic Species

BLM states in the EA that the fanshell and pink mucket pearly mussel are not documented on the Wayne National Forest.¹³⁶ The fanshell, however, is found immediately downstream of the Marietta Unit in the Belleville and Racine pools of the Ohio River in Wood County, West Virginia and in the lower Muskingum River.¹³⁷ And the pink mucket has been found in the Belleville, Racine, Gallipolis, and Greenup pools of the Ohio River and potentially still exists in the lower Muskingum River; its distribution is presumed to be in Gallia, Meigs, Morgan, Washington, and Lawrence counties.¹³⁸ These species’ host fish are also found within the Wayne National Forest. Because the host fish may move between the streams in the Wayne

¹³² *Id.*

¹³³ Final EA at 48.

¹³⁴ *Id.*

¹³⁵ Final EA at 100.

¹³⁶ Final EA at 49.

¹³⁷ Forest Plan EIS, Appendix F1, Biological Assessment at F1-112.

¹³⁸ Forest Plan EIS, Appendix F1, Biological Assessment at F1-126 – F1-127.

and the Ohio River, they may play a role in the life cycle of these mussels.¹³⁹ Moreover, BLM acknowledges that the endangered snuffbox mussel and sheepnose mussel may be present in waterways within the Wayne National Forest.¹⁴⁰

The EA provided no analysis for impacts to these endangered species, claiming that forest activities are “not likely to adversely affect” fanshell and pink mucket pearly mussel, and will have “no effect” on sheepnose and snuffbox mussels.¹⁴¹ The BLM relied on a 2012 “Supplemental Information Report” (SIR), which is not a NEPA analysis because it did not go through public comment and review. Tiering the required analysis in a NEPA document to a non-NEPA document is improper. 40 C.F.R. § 1508.28 (noting that tiering under NEPA is appropriate only when the initial broader analysis is found in an EIS).

In addition, the 2012 SIR acknowledges that these species are threatened by reduced water flows. High volume water depletions for fracking and horizontal drilling would impact these species, whether or not those depletions occur on private or federal surface. And the 2012 SIR was wrong to conclude that “[a]t the site specific level the WNF will be able to control withdrawals and limit them to periods when water is plentiful,” as many depletions could occur in connection with private surface activities.

e. The EA fails to perform site-specific analysis of impacts and risks of drilling operations to water resources located within, or in close proximity to the December 2017 Parcels.

Maps created by the Center with data provided by the BLM indicate that several different waterways pass through, or near to, all of the nominated parcels. Parcel OHES 058308 ACQlie less than 0.5-.08 miles away from both Little Trail Run and the headwaters of Claylick Run. Dogskin Run, moreover, passes directly through OHES 058312, while Little Muskingum Run touches the western portion of OHES 058311; Walnut Camp Run passes through OHES 058310 as well.¹⁴²

The DNA, and the December 2016 EA to which it tiers, fails to address the site-specific impacts these waterways from drilling operations in the proposed parcels. This is especially problematic given the potential for spills and leaks, as evidenced by persistent spill problems associated with the Rover Pipeline highlighted in the following section. The BLM must conduct an EIS, or at the very least an EA, to assess the potential site-specific impacts to the waterways identified above; this assessment should include taking a hard look at potential direct and indirect impacts of leasing on the identified waterways including, but not limited to, impacts to municipal water supplies, recreation areas (e.g., the Little Muskingum River), and special status species that may be present.

4. BLM Failed to Account for the Cumulative Impacts of Private Surface Development and Fracking Projects on the Ohio River and Other Related Infrastructure Projects.

¹³⁹ Forest Plan EIS, Appendix F1, Biological Assessment at F1-116, F1-122.

¹⁴⁰ Final EA at 49.

¹⁴¹ Final EA at 100.

¹⁴² Center Parcel Map; (also available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>)

BLM failed to adequately analyze the cumulative impacts of its approved leasing, in connection with past, present, and future projects planned in and around the Wayne National Forest. First, the EA performs no meaningful analysis of existing and expected oil and gas development on private lands and/or on private minerals in and around the forest and throughout southeast Ohio. It completely glosses over the fact that extensive horizontal drilling and fracking are already occurring in this area,¹⁴³ and has already caused severe impacts on resources within the forest's administrative boundary.¹⁴⁴ As a result, it fails to acknowledge the cumulative effects of these existing projects, in connection with fracking enabled by the December 2017 lease sale and prior sales. BLM must consider the cumulative effects of this project in connection with new leasing for purposes of both NEPA and ESA Section 7.

In addition, several other major projects have been proposed in the vicinity of the Marietta Unit, but the EA fails to address their cumulative effects in connection with new leasing. First, petrochemical giant PTT Global Chemical is considering the construction of a massive multibillion-dollar ethane cracker in Dilles Bottom, Ohio, in Belmont County, north of the Marietta Unit.¹⁴⁵ Ethane would be sourced from the Marcellus and Utica shales and processed at the cracker plant for conversion to ethylene, and other compounds for the production of antifreeze and plastic products. Land clearing and cleanup of the project site is ongoing, and a final decision on whether the project will be built is expected early this year. JobsOhio, a private nonprofit corporation, has already invested \$14 million in the project, while PTT is investing \$100 million in a feasibility study for the project.¹⁴⁶ The Ohio EPA recently approved water pollution permits for the project's discharges into the Ohio River and is currently considering the project's air permits.¹⁴⁷ PTT Global Chemical also recently purchased 168 acres in Belmont County for the future site of its plant.¹⁴⁸

Second, Energy Storage Ventures (ESV) has proposed a massive project to store 168 million gallons of natural gas liquids in eight underground salt caverns along the Ohio River in Monroe County, 12 miles south of the proposed Belmont cracker plant.¹⁴⁹ The project is proposed on a former coal mine and expected to be operating in 2018. ESV has begun testing for the project and has applied for a 401 water quality certification with Ohio EPA and other permits with Ohio Department of Natural Resources. Located in the heart of the Utica and Marcellus shale plays, the project could potentially serve the Belmont cracker, Royal Dutch Shell's

¹⁴³ FracTracker, Utica Shale Hydrliac Fracturing Wells in Ohio as of June 2017, available at <http://maps.fractracker.org/3.13/?appid=2b7611b38d434714ba2033d76cc0ccc3>; ODNr, Location Data for Ohio Utica Shale Wells (as of July 9, 2017).

¹⁴⁴ See Exhibit C at ¶¶ 14-17.

¹⁴⁵ Junkins, Casey, Work on Dilles Bottom Cracker Plant Goes On, *The Intelligencer* (July 14, 2016), available at <http://www.theintelligencer.net/news/top-headlines/2016/07/work-on-dilles-bottom-cracker-plant-goes-on/>.

¹⁴⁶ Gearino, Dan, JobsOhio invests in prep work for planned Belmont County Plant, *The Columbus Dispatch* (Dec. 5, 2016), available at <http://www.dispatch.com/content/stories/business/2016/12/06/jobsohio-invests-in-prep-work-for-planned-belmont-county-plant.html>.

¹⁴⁷ O'Brien Dan, OEPA Issues Permits for Belmont County Cracker Plant, *Business Journal Daily* (Jan. 18, 2017), available at <http://businessjournaldaily.com/oepe-issues-permit-for-belmont-county-cracker-plant/>.

¹⁴⁸ Funk, John, Ohio ethane cracker plant closer to reality on former FirstEnergy property, *Cleveland Plain Dealer* (July 12, 2017), available at http://www.cleveland.com/metro/index.ssf/2017/07/ohio_ethane_cracker_plant_clos.html.

¹⁴⁹ Junkins, Casey, Ethane to Be Stored Underground in Monroe County, *The Intelligencer* (Feb. 5, 2017), available at <http://www.theintelligencer.net/news/top-headlines/2017/02/ethane-to-be-stored-underground-in-monroe-county/>.

proposed cracker plant in Beaver County, Pennsylvania, a plant across the Ohio River in West Virginia, and production operations in surrounding areas, including the Wayne National Forest. The potential for accidental leaks from gas storage facilities is illustrated by the recent catastrophe at the Aliso Canyon facility in Porter Ranch, California in 2015-2016. The leak spewed 109,000 metric tons of methane into the air, took four months to cap, forced the evacuation of 7,000 residents, and resulted in complaints of headaches, fatigue, nausea, and rashes.¹⁵⁰ Some residents also experienced these symptoms before the leak.

Third, Royal Dutch Shell has committed to the construction of a multibillion dollar cracker plant in Beaver County, Pennsylvania—one of the largest of its kind in North America.¹⁵¹ Like the cracker and storage projects above, Shell's plant will be built on the banks of the Ohio River. The project will process 105,000 barrels of ethane per day from Marcellus and Utica shale producers and produce 1.6 million tons of polyethylene per year. Shell's decision makes it far more likely that PTT Global Chemical will build its proposed cracker plant in Belmont County. Increased operational efficiencies are possible with another cracker in the region, in the event pipelines or plant operations go down.

Fourth, the Rover Pipeline (the "Pipeline"), currently under construction by Energy Transfer Partners LP (ETP) and its subsidiary Rover Pipeline LLC (Rover), is planned to extend over 700 miles across four states.¹⁵² The Pipeline will transport natural gas from the Marcellus Shale play to delivery points in Michigan and Canada.¹⁵³ Portions of the Pipeline run directly adjacent to segments of the Wayne National Forest. Some parts of the Pipeline pass within four miles of the nominated December 2017 parcels.¹⁵⁴ It seems highly likely that pipelines from lease parcels in the Wayne will feed into the Rover Pipeline.

Since work began on the pipeline in March of this year, the Ohio Environmental Protection Agency (Ohio EPA) has "registered more than 30 environmental complaints...including a leak of at least 2 million gallons — the state says it could be as much as 5 million gallons — of drilling mud in April..." in Stark County.¹⁵⁵ The spill occurred over roughly, "500,000 square feet of wetland near the Tuscarawas River...[such] [d]ischarges can affect water chemistry and potentially suffocate wildlife, fish and microinvertebrates."¹⁵⁶

¹⁵⁰ KPBS, Utilities Commission Approves Aliso Canyon Investigation (Feb. 8, 2017), available at <http://www.kpbs.org/news/2017/feb/09/utilities-commission-approves-aliso-canyon-investi/>; Cardwell, Diane, The Long Reach of the Aliso Canyon Gas Leak, New York Times (Jan. 14, 2017), available at https://www.nytimes.com/2017/01/14/business/energy-environment/aliso-canyon-gas-leak.html?_r=0.

¹⁵¹ Marcellus Drilling News, Shell PA Cracker Plant Project A Lot Bigger Than First Thought (June 2016), available at <http://marcellusdrilling.com/2016/06/shell-pa-cracker-plant-project-a-lot-bigger-than-first-thought/>; Litvak, Anya, Shell cracker plant in Beaver County to provide 600 jobs when it opens, Pittsburgh Post-Gazette (June 7, 2016), available at <http://powersource.post-gazette.com/powersource/companies/2016/06/07/Shell-says-Marcellus-cracker-is-a-go-ethane-beaver-county-pennsylvania-pittsburgh/stories/201606070131>.

¹⁵² Mandel, Jenny, Ohio takes legal action over Rover construction violations, Environment & Energy News Reporter, (Jul. 11, 2017), <https://www.eenews.net/energywire/stories/1060057181/search?keyword=Ohio+takes+legal+action+over+Rover+construction+violations>.

¹⁵³ *Id.*

¹⁵⁴ See Center Parcel Map

¹⁵⁵ *Id.*

¹⁵⁶ Renault, Marion, Ohio pipeline construction spill sends 2 million gallons of mud into two Ohio wetlands, The Columbus Dispatch, (Apr. 20, 2017), available at <http://www.dispatch.com/news/20170420/pipeline-construction->

ETP initially led regulators to believe that the spill contained only non-toxic, but environmentally harmful, drilling “mud.”¹⁵⁷ In June, however, diesel fuel was detected in the spilled mud in at least three separate locations, in violation of the terms of ETP’s permit for mud composition, as well as its permit for the storage of the leaked material in a quarry located roughly “1,000 feet from the city of Massillon’s public water system intake.”¹⁵⁸ As of May 2017, the Ohio EPA has fined ETP for 18 separate spills.¹⁵⁹ This includes a spill of 50,000 gallons on April 14 occurring just one day after the Stark County spill and also impacting a sensitive wetland in Richland County.¹⁶⁰ The above projects are reasonably foreseeable and could have far-reaching, significant effects on the Wayne National Forest, Ohio River, and neighboring communities. Some of these projects will certainly require a network of pipelines for transport of ethane, including pipelines through the Wayne National Forest and along the Ohio River, and/or an enormous amount of truck traffic. They also entail known and foreseeable spill risks. Accordingly, BLM must consider the cumulative effects of new oil and gas leasing in connection with these projects’ water quality, air quality, climate change, wildlife, and public health impacts, under both NEPA and ESA Section 7.

5. The EA Fails to Demonstrate Conformity with the Clean Air Act

BLM failed to establish conformity with Clean Air Act requirements triggered by the Washington County sulfur dioxide (SO₂) non-attainment area. As noted in the EA, Washington County is currently in non-attainment for sulfur dioxide.¹⁶¹ A non-attainment designation triggers further requirements under the Clean Air Act. BLM completely failed to meet these additional requirements in the EA.

Implementation of the Clean Air Act exemplifies cooperative governance between the states and the federal government. The Clean Air Act aims “to protect and enhance the quality of the Nation’s air resources . . .” 42 U.S.C. § 7401(b)(1). The Clean Air Act states: “No department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity” that does not conform to an approved state air quality implementation plan or “SIP.” 42 U.S.C. § 7506(c)(1). “The assurance of conformity . . . shall be an affirmative responsibility of the head of such . . . agency.” To ensure conformity, agency actions must not “cause or contribute to any new

spill-sends-2-million-gallons-of-drilling-mud-into-two-ohio-wetlands.

¹⁵⁷ *Id.*

¹⁵⁸ Mandel, Jenny, Diesel found in Ohio Rover spill draws new fines, Environment & Energy News Reporter, (Jun. 9, 2017), available at <https://www.eenews.net/energywire/stories/1060055786/search?keyword=Diesel+found+in+Ohio+Rover+spill+drew+new+penalties>.

¹⁵⁹ Mufson, Steven, Pipeline spill by Dakota Access company could have a “deadly effect”, The Washington Post, (May 8, 2017), available at https://www.washingtonpost.com/news/energy-environment/wp/2017/05/08/pipeline-spill-by-dakota-access-company-could-have-a-deadly-effect/?utm_term=.0ff8270e7d7f; Renault, Marion, Feds shut down new drilling along Rover pipeline project, Columbia Dispatch (May 11, 2017), available at <http://www.dispatch.com/news/20170511/feds-shut-down-new-drilling-along-rover-pipeline-project>; Sierra Club Ohio Chapter, Rover Pipeline Proves to be Disastrous Update (May 31, 2017), available at <http://www.sierraclub.org/ohio/blog/2017/05/rover-pipeline-proves-be-disastrous-update>.

¹⁶⁰ Mufson, Steven, The company behind the Dakota Access pipeline is in another controversy, Washington Post, (Apr. 27, 2017), available at https://www.washingtonpost.com/news/energy-environment/wp/2017/04/27/the-company-behind-the-dakota-access-pipeline-is-in-another-controversy/?utm_term=.fd37869145a2.

¹⁶¹ Draft EA, pp. 36-37.

violation of any [air quality] standard” or “increase the frequency or severity of any existing violation of any standard in any area.” *Id.* § 7506(c)(1)(B). This statute is very broadly applicable.

A SIP is a federally approved set of state regulations that are designed to prevent air quality deterioration and to restore clean air in areas that are out of attainment with federal standards. Conformity to a SIP as defined in the Clean Air Act, 42 U.S.C. § 7506(c)(1)(AB), means:

(A) conformity to an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and

(B) that such activities will not—

(i) cause or contribute to any new violation of any standard in any area;

(ii) increase the frequency or severity of any existing violation of any standard in any area; or

(iii) delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

The “assurance of conformity” to a SIP “shall be an affirmative responsibility” of a federal agency. 42 U.S.C. § 7506(c)(1). For Federal actions not related to transportation plans, “a conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a nonattainment or maintenance area caused by a Federal action would equal or exceed..[tons]/per year.” 40 C.F.R. § 93.153(b).

There are certain limited exceptions to general conformity requirements under the Clean Air Act, such as when emissions from federal actions are below de minimis thresholds. Portions of federal actions that require a permit under the Clean Air Act’s new source review program, as set forth under 42 U.S.C. §§ 7410(a)(2)(c) and 7503, are also not subject to general conformity requirements. See 40 C.F.R. § 93.150(d).

The purpose of general conformity is to “prevent the Federal Government from interfering with the States’ abilities to comply with the CAA’s requirements.” *Dep’t of Transp. v. Pub. Citizen*, 541 U.S. 752, 758 (2004). An action “delays attainment only if its implementation postpones attainment beyond the date by which it would have been achieved without the project.” *Nat. Res. Def. Council v. E.P.A.*, 661 F.3d 662, 665 (D.C. Cir. 2011).

Before action is taken, a federal agency must make a determination that the federal action conforms to “certain threshold emission rates set forth in § 93.153(b).” *Pub. Citizen*, 541 U.S. at 771. If the action’s direct and indirect emissions will exceed de minimis levels, then the agency must demonstrate conformity. *Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 833 F.3d 1136, 1148 (9th Cir. 2016); see also 40 C.F.R. § 93.153(b)(1) (defines de minimis emission rates). Because “[n]either the federal nor the state rule identify the form an agency must use

when deciding whether a project necessitates a full-scale conformity determination,” courts have found it sufficient for an agency to explain their conformity decision in a NEPA document. *California ex rel. Imperial Cty. Air Pollution Control Dist. v. U.S. Dep’t of the Interior*, 767 F.3d 781, 799 (9th Cir. 2014). Thus, “[a]n agency need not prepare a stand-alone document explaining such a decision.” *Id.* Likewise, the Federal Land Policy and Management Act (FLPMA) requires the Secretary of the Interior, in developing and revising land use plans, to “provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation plans.” 43 U.S.C. § 1712(c)(8).

Sulfur Dioxide (SO₂) has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.¹⁶² Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.¹⁶³

A 2011 interagency guidance memorandum of understanding, signed by the Department of Interior, outlines a commitment by the agency to undergo detailed analyses of air quality compliance, with a particular focus on non-attainment areas. The MOU establishes “a clearly defined, efficient approach to compliance with [NEPA] regarding air quality . . . in connection with oil and gas development on Federal lands.”¹⁶⁴ The MOU “provides for early interagency consultation throughout the NEPA process; common procedures for determining what type of air quality analyses are appropriate and when air modeling is necessary; specific provisions for analyzing and discussing impacts to air quality and for mitigating such impacts; and a dispute resolution process to facilitate timely resolution of differences among agencies.”¹⁶⁵ The goal of this process is to ensure that “[F]ederal oil and gas decisions do not cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS).”¹⁶⁶ The MOU outlines recommended technical, quantitative procedures to follow, which include identifying the reasonably foreseeable number of oil and gas wells and conducting an emissions inventory of criteria pollutants. Further air quality modeling is required if certain criteria are met, based on the level of emissions impact and the geographic location of the action.¹⁶⁷ The MOU indicates that “[e]xisting reasonably foreseeable development scenarios can be used to identify the number of wells.”¹⁶⁸

In response to this interagency MOU, BLM implemented internal regulations in 2012 establishing a 10-step process for conducting a general conformity determination in compliance with the Clean Air Act section 176(c).¹⁶⁹ The EA makes no mention of requirements under CAA

¹⁶² U.S. Environmental Protection Agency, Sulfur Dioxide <http://www.epa.gov/airquality/sulfurdioxide/health.html>, available at (accessed July 29, 2015).

¹⁶³ *Id.*

¹⁶⁴ Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the National Environmental Policy Act Process, Preamble (2011), available at: <https://www.epa.gov/sites/production/files/2014-08/documents/air-quality-analyses-mou-2011.pdf>.

¹⁶⁵ *Id.* at 4.

¹⁶⁶ *Id.* at 1, 2.

¹⁶⁷ *Id.* § V.E.1., pg. 9.

¹⁶⁸ *Id.*

¹⁶⁹ United States Department of the Interior, Bureau of Land Management, Instruction Memorandum No. 2013-025, *Guidance for Conducting Air Quality General Conformity Determinations* (December 4, 2012) found at

section 176(c), and does not cite to any conformity analysis in the preceding 2006 Forest Plan or the 2012 SIR. But, even if BLM did a full conformity determination in these past documents, the analysis would not reflect the current non-attainment designations and Ohio's most recent SIP revisions, and are therefore inadequate for purposes of demonstrating conformity to CAA requirements.

BLM can practically control air emissions in a number of ways including, but not limited to, by choosing not to lease certain areas or by including stipulations that require limits on emissions or emitting practices. The agency has continuing program responsibility for those emissions, both through subsequent permit actions and ongoing inspection and enforcement oversight. BLM provides no emissions inventory, monitoring data or analysis of any potential direct and indirect emissions based on oil and gas industry standards for development, operations and ongoing maintenance. The BLM also did not include a comprehensive and enforceable set of air quality mitigation measures to ensure its decision to lease will not cause or contribute to violations of air quality standards. BLM "encourages industry to incorporate and implement Best Management Practices"¹⁷⁰ ("BMPs") to reduce air quality impacts, but such measures would be encouraged, not required. These non-mandatory measures do not go far enough in either analysis or commitments. The discretionary and non-specific nature of the BMPs is very concerning since they are relied upon in the EA as a primary means for protecting air resources and are part of BLM's justification for not proposing additional mitigation to address air quality impacts. Therefore, BLM utterly ignored requirements under the CAA to demonstrate conformity in its decision to lease parcels for oil and gas development in the Wayne National Forest.

6. BLM Violated Section 7 of the ESA by Failing to Consult with FWS on the Impacts of the Proposed Oil and Gas Leasing on Threatened and Endangered Species

Congress enacted the ESA to provide "a program for the conservation of . . . endangered species and threatened species." 16 U.S.C. § 1531(b). Section 2(c) of the ESA establishes that it is "the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act." 16 U.S.C. § 1531(c)(1). The ESA defines "conservation" to mean "the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary." 16 U.S.C. § 1532(3). Section 7(a)(1) of the ESA explicitly directs that all federal agencies "utilize their authorities in furtherance of the [aforesaid] purposes" of the ESA. 16 U.S.C. § 1536(a)(1).

Section 7 of the ESA requires BLM, in consultation with FWS, to insure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species, or (2) result in the destruction or adverse modification of the critical habitat of such species. 16 U.S.C. § 1536(a)(2). For each proposed federal action, BLM must request from FWS whether any listed or proposed species may be

https://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-025.html.

¹⁷⁰ Draft EA, p. 66. Merely stating that operations that would violate an applicable air quality standard would not be approved is insufficient; NEPA requires more than an analysis of whether a project will violate other environmental statutory requirements.

present in the area of the agency action. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12. If listed or proposed species may be present in such area, BLM must prepare a “biological assessment” to determine whether the listed species may be affected by the proposed action. *Id.*

If BLM determines that its proposed action may affect any listed species or critical habitat, the agency must engage in formal consultation with FWS. 50 C.F.R. § 402.14. To complete formal consultation, FWS must provide BLM with a “biological opinion” explaining how the proposed action will affect the listed species or habitat. 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14. If FWS concludes that the proposed action will jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of critical habitat, the biological opinion must outline “reasonable and prudent alternatives.” 16 U.S.C. § 1536(b)(3)(A).

BLM’s oil and gas leasing decisions—including its decision to open up all federal minerals in the Marietta Unit for oil and gas leasing and its decision to lease federal minerals in the December 2017 lease—are each agency actions under the ESA. Action is broadly defined under the ESA to include all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies, including the granting of leases, and actions that will directly or indirectly cause modifications to the land, water, or air. 50 C.F.R. § 402.02. BLM, however, failed to request from FWS whether any listed or proposed species may be present in the action area. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12.

Moreover, there are listed species in the action area, and thus BLM further violated the ESA by failing to prepare a biological assessment for its leasing decision. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12. As BLM admits in the EA, the Indiana bat is “well-documented on all units” of the Wayne National Forest, the Marietta Unit “contains ample suitable foraging and roosting habitat” for the northern long-eared bat, and sheepnose and snuffbox mussels “may be present on waterways within the [Wayne National Forest].” EA at 48-49. Additionally, the fanshell is found immediately downstream of the Marietta Unit, and the pink mucket has been found in the Belleville, Racine, Gallipolis, and Greenup pools of the Ohio River and potentially still exists in the lower Muskingum River in the Belleville and Racine pools of the Ohio River in Wood County, West Virginia and in the lower Muskingum River.¹⁷¹ To the extent that BLM initiated consultation on its proposal to open up all federal minerals in the Marietta Unit to oil and gas through the preparation of its November 4, 2015 Biological Assessment (BA)¹⁷² and submission of the BA to FWS, BLM and FWS have failed to complete consultation, in violation of 16 U.S.C. § 1536(a)(2) and 50 C.F.R. §§ 402.13(a), 402.14.

BLM’s leasing decisions may affect the threatened and endangered species in the action area, and downstream from the action area. As stated in the EA, the Forest Service has already determined that “oil and gas activities are likely to adversely affect Indiana bat,” and “tree removal may result in impacts to individual northern long-eared bats.” EA at 99-100. Additionally, the water depletions, increased surface disturbance, and toxic spills from hydraulic fracturing and horizontal drilling throughout the Marietta Unit “may affect” the sheepnose and snuffbox mussels, as well as fanshell and pink mucket pearly mussels found downstream from

¹⁷¹ Forest Plan EIS, Appendix F1, Biological Assessment at F1-112, F1-126 – F1-127.

¹⁷² BLM, Northeastern States District, Biological Assessment of Wayne National Forest Leasing 2015-2016 All Units (January 2016).

the proposed areas for lease. BLM therefore violated the ESA by failing to consult with FWS concerning the impacts of its oil and gas leasing proposal on these listed species. 16 U.S.C. § 1536(a)(2). And because BLM has failed to comply with the Section 7 consultation procedures, it cannot insure that the proposed oil and gas leasing will not jeopardize any listed species, or destroy or adversely modify any critical habitat, in further violation of Section 7 of the ESA. *Id.*

BLM asserts in the EA that it can wait to engage in ESA consultation with FWS when it receives an application for a permit to drill. EA at 20. This position, however, violates the ESA and has been rejected by the courts. For instance, in *Conner v. Burford*, the Forest Service issued oil and gas leases on national forests in Montana without preparing an EIS, and without consulting on all phases of the oil and gas leases. 848 F.2d 1441 (9th Cir. 1988). The United States Court of Appeals for the Ninth Circuit held that the sale of a non-NSO oil and gas lease constitutes an irreversible commitment of resources. *Id.* at 1451. For BLM's oil and gas leasing decisions on the Wayne National Forest, NSO leases are proposed for only a small portion of the overall area available for leasing, with non-NSO leases proposed for the majority of the national forest. *See* EA at 43.

The federal agency defendants in *Conner v. Burford* did not even dispute that the agencies were required to consult under Section 7 of the ESA, and that FWS was required to prepare a biological opinion, before any of the leases could be sold. *Conner*, 848 F.2d at 1453. The Ninth Circuit further held that FWS was required to consider all phases of the oil and gas leases within the biological opinion, including all post-leasing activities. *Id.* "Therefore the FWS was required to prepare, at the leasing stage, a comprehensive biological opinion assessing whether or not the agency action was likely to jeopardize the continued existence of protected species." *Id.* BLM's failure to consult with FWS on its oil and gas leasing decisions for the Wayne National Forest plainly violates Section 7 of the ESA. 16 U.S.C. 1536(a)(2).

7. BLM's Reliance on the 2005 Forest Plan Biological Opinion Violates the ESA

BLM relies extensively on the 2005 Biological Opinion prepared by FWS for the 2006 Forest Plan for the Wayne National Forest.¹⁷³ BLM acknowledges, however, that this 2005 Biological Opinion is programmatic and "non-site-specific."¹⁷⁴ This 2005 programmatic biological opinion for the Forest Plan does not excuse BLM's obligation to consult under the ESA for its oil and gas lease decisions. *See Conner*, 848 F.2d at 1453.

Moreover, BLM's reliance on the 2005 Biological Opinion is misplaced because it is out of date. Agencies are required to reinstate ESA consultation if (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the action is modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. 50 C.F.R. § 402.16. Despite extensive new information and newly listed species, the Forest Service and FWS have failed to reinstate consultation on the 2005 Biological Opinion.

¹⁷³ Final EA at 19.

¹⁷⁴ *Id.*

i. New Information

The 2006 Biological Opinion for the 2006 Forest Plan does not address three issues where there has been significant new information over the past decade that is directly relevant to the Forest Plan and its impacts on listed species and critical habitat: new drilling techniques, white-nose syndrome, and climate change. This failure to reinitiate consultation on the 2005 Biological Opinion to address this decade of significant new information violates the ESA. 50 C.F.R. § 402.16.

a. Horizontal Well Development

The 2005 Biological Opinion for the Forest Plan is woefully outdated, failing to address the severe impacts of hydraulic fracturing and horizontal drilling on the Indiana bat and other species. As discussed, the Forest Service only analyzed the effects of vertical well development on the federal surface in the EIS for the 2006 Forest Plan. The rise in fracking and horizontal drilling, and recent data regarding horizontal well pad surface disturbance, constitutes new information revealing effects of the action that may affect listed species in a manner or to an extent not previously considered, and triggers the duty of the BLM, Forest Service, and FWS to reinitiate consultation on the 2005 Biological Opinion. 50 C.F.R. § 402.16(b).

The likelihood that new federal leasing will open up private minerals for development and entail the development of horizontal well pads on private surface also triggers reinitiation. The effects of the proposed leasing must be evaluated “together” with these “interdependent” private surface activities in a reinitiated consultation, regardless of whether BLM or the Forest Service authorizes the private surface activities. 50 C.F.R. §§ 402.02, 402.16; *Sierra Club v. U.S. DOE*, 255 F. Supp. 2d 1177, 1188 (D. Col. 2002) (agency that granted easement to mine required to analyze mine’s impacts on listed species, even though another agency authorized mine). While the number of new horizontal well pads on private surface that federal leasing could lead to has never been analyzed, significant habitat loss (e.g., fragmentation and loss of maternal summer roost areas) that is not accounted for in the 2005 Biological Opinion and hazardous conditions endangering listed species could result from these activities. Moreover, weaker state regulations, such as those permitting wastewater ponds, would govern these private activities.

The same holds true for effects of horizontal drilling on federal surface activities overlying private minerals (which could also be opened up with new federal leasing)—in these split estate situations, the Forest Service can only request operators to voluntarily comply with Standards and Guidelines set forth in the Forest Plan. Indeed, if well development on private and federal surface were proportionate to the Marietta Unit’s private and federal surface acreages, a significant portion of wells within the Forest (75%) would escape mandatory federal controls. The resulting take could be cumulatively significant and lead to forest-wide, population-level effects on the Indiana bat and other species.

BLM’s implicit determination in the EA that existing regulatory mechanisms will reduce or avoid effects on the Indiana bat and other listed species from private surface and mineral development activities is not a proper basis for failing to consult with Fish and Wildlife Service regarding these impacts. Because it is clear that private surface and mineral development adjacent to federal surface in the WNF “may” affect listed species—issues that have never been considered in prior consultations—BLM and the Forest Service must reinitiate consultation with

Fish and Wildlife Service on the 2005 Biological Opinion to ensure that oil and gas leasing does not jeopardize the Indiana bat or others species before these leases can proceed.

b. White-Nose Syndrome

White-nose syndrome (“WNS”) is a fatal disease affecting hibernating bats that is named for a white fungus that appears on the muzzle and other parts of bats. The disease has spread rapidly across the eastern and midwestern United States, and is estimated to have killed more than 6 million bats in the Northeast and Canada.¹⁷⁵ Bats with white-nose syndrome “act strangely during cold winter months, including flying outside during the day and clustering near the entrances of caves and other hibernation areas.”¹⁷⁶ These abnormal behaviors “may contribute to the untimely consumption of stored fat reserves causing emaciation, a characteristic documented in a portion of the bats that die from WNS.”¹⁷⁷

White-nose syndrome has spread to 16 counties in Ohio,¹⁷⁸ including in the Wayne National Forest in Lawrence County.¹⁷⁹ It has also spread to West Virginia’s Wetzel County, which lies directly across from Monroe County, on the other side of the Ohio River, and very near the Marietta Unit.¹⁸⁰ In 2011, the Forest Service performed a review of new information regarding the Wayne National Forest Plan and white-nose syndrome and concluded that supplementation of the environmental review for the Forest Plan was not necessary at that time. However, since then, a 2013 study has determined that white-nose syndrome threatens the Indiana bat with a high risk of extirpation throughout large parts of its range.¹⁸¹ The study concluded:

Our sensitivity analyses indicated that management actions devoted to increasing, in order, winter, summer, and fall survival of breeding adult females would have the greatest potential for mitigating impacts of WNS on Indiana bat populations. Management actions for improving survival, however, may be difficult to achieve because these parameters are quite high (95% seasonal survival) in the absence of WNS. Alternatively, increasing reproduction, while less efficient at addressing a declining population trajectory, has more room for improvement; further, if

¹⁷⁵ USFWS, White-nose syndrome: The devastating disease of hibernating bats in North America (May 2016), available at https://www.whitenosesyndrome.org/sites/default/files/resource/white-nose_fact_sheet_5-2016_2.pdf.

¹⁷⁶ *Id.*

¹⁷⁷ USGS, National Wildlife Health Center, White-Nose Syndrome, available at http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/.

¹⁷⁸ Ohio Dept. of Natural Resources, White-nosesSyndrome.org, available at <https://www.whitenosesyndrome.org/partner/ohio-department-natural-resources>; White-nose Syndrome.org, Updated white-nose syndrome map (May 10, 2016) <https://www.whitenosesyndrome.org/resource/updated-white-nose-syndrome-map-may-10-2016>.

¹⁷⁹ USFS, White-nose Syndrome Detected in Ohio (Mar. 30, 2011), available at http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPyhQoY6BdkOyoCAGixyPg!/?ss=110914&navtype=BROWSEBYSUBJECT&cid=STELPRDB5288711&navid=1800000000000000&pnavid=null&position=News&tttype=detail&pname=Wayne%20National%20Forest-%20News%20&%20Events.

¹⁸⁰ White-Nose Syndrome.org, WNS Information Resources (2017), available at <https://www.whitenosesyndrome.org/resources>.

¹⁸¹ Thogmartin, Wayne E. et al. White-nose syndrome is likely to extirpate the endangered Indiana bat over large parts of its range, *Biological Conservation*, Vol. 160, pp. 162-172 (April 2013), available at <http://www.sciencedirect.com/science/article/pii/S0006320713000207>.

management actions on the breeding grounds to improve reproduction also improve adult female summer survival, our global sensitivity analyses suggest improved performance in the other parameters may occur as well. *Because of the heightened risk faced by small, range-restricted populations* (Terborgh and Winter, 1980; Gilpin and Soulé, 1986; Schoener and Spiller, 1987), *it is also prudent in the face of this potential extinction agent to limit additive sources of mortality.* Our model suggests a timeframe for action, for the species is expected to reach its lowest level of abundance by the early 2020s, no more than a decade hence.¹⁸²

Moreover, since 2011, Ohio has experienced steep declines in bat populations throughout the state. In a February 19, 2015 letter initiating formal conferencing for the northern long-eared bat, the Forest Service cited data showing the rapid declines of the bats likely from white-nose syndrome:

In Ohio, hibernaculum surveys from pre-2011 (before WNS) to 2014 (post-WNS) suggest an 85% decline in the winter bat population (Norris 2014). A 2014 mid-winter bat census at the Lawrence County mine indicated the collapse (99% decline) of the hibernating bat population. Statewide summer acoustic surveys in Ohio indicate a declining trend in the number of overall bat detections (all species) recorded. For instance, a comparison of the number of calls detected in 2014 to 2011 suggests 47% fewer bats detected overall (Norris 2014J. Preliminary bat capture data collected on the WNF during the summer of 2014 suggest relative declines in several previously common species that are now WNS-affected, including little brown bats and NLEBs. The averaged pre-WNS (1997-2008) bat capture rate for all species (6.6 bats per net-night) declined by 75% to 1.64 bats per net-night in 2014 (post-WNS). While there is evidence that there may be some persistence of WNS -affected bats on the landscape in the longest affected areas of the northeastern USA (unpublished data, 7th Annual White-Nose Syndrome Workshop, 8-12 Sept 2014, St. Louis, MO), and bats can and do survive and heal from the disease (Fuller et al. 2011), long-term survivorship is difficult to predict due to the newness of the disease.¹⁸³

Since these 2015 findings, the impacts of white-nose syndrome have worsened. As of 2016, white-nose syndrome has spread to 19 counties in Ohio,¹⁸⁴ but according to Ohio state officials, the disease is probably much more widespread. Since the outbreak of white-nose syndrome in Ohio in 2011, researchers have now recorded a 90 percent decline in hibernating bat populations at the state's two largest hibernacula — a closed limestone mine in Preble County near the Indiana border west of Dayton, where nearly 40,000 bats had once been observed, and a shuttered mine in Lawrence County near Ohio's southern tip.¹⁸⁵ Bat-detection rates in the

¹⁸² *Id.*

¹⁸³ Wayne National Forest Supervisor's Office Letter to Dan Everson U.S. Fish and Wildlife Service initiating formal conferencing for the northern long-eared bat (February 19, 2015)

¹⁸⁴ Lyttle, E. Hikers spreading fungus that's killing Ohio bats. *The Columbus Dispatch*. June 15, 2016 ("Lyttle 2016"), available at <http://www.dispatch.com/content/stories/local/2015/06/15/humans-have-role-in-spread-of-bat-ills.html>

¹⁸⁵ Lyttle 2016.

summer have fallen by more than 50 percent.¹⁸⁶ Finally, these declining population trends are supported by the findings of the FWS's 2017 Indian Bat (*Myotis sodalist*) Population Status Update, which again show a near 40% decrease in Ohio populations since 2015, and near 70% drop since 2009.¹⁸⁷

The potential for white-nose syndrome to wipe out the Indiana bat in large parts of its range makes the bat's population much more sensitive to other threats, including oil and gas development. It is therefore crucial to reduce these threats. Moreover, the bat's extremely slow reproduction rate (at most, one pup per year) and specialized summer roosting habitat needs (mature or dying trees or oak or hickory trees with exfoliating bark) compound these threats.¹⁸⁸ Maximizing availability of summer roosting trees is thus essential to recovery of the species, while loss of roosting trees would undermine its survival and recovery.

New information concerning this devastating disease reveals effects of the leasing proposal that "may affect [the Indiana bat]...in a manner or to an extent not previously considered," and compels reinitiation.

c. Climate Change

Climate change is also projected to shift the Indiana bat's range, because the species' reproductive cycles, hibernation patterns, and migration are closely linked to temperature. One landmark study projects that warming summer temperatures will cause "maternity colonies in the western portion of the range [including Ohio]...to begin to decline and possibly disappear in the next 10–20 years," causing the range to shift northeast-ward.¹⁸⁹ The researchers note that "the effects of climate change should be considered in future threats analyses and conservation strategies for the Indiana bat," and that "management actions which foster high reproductive success and survival...will be critical for the conservation and recovery of the species."¹⁹⁰ The 2005 Biological Opinion does not account for climate change effects. BLM and the Forest Service must consult with FWS regarding these effects on the Indiana bat.

ii. Newly Listed Species

In addition to the significant new information, there have also been species listed since the 2005 Biological Opinion that may be affected by the Forest Plan, and oil and gas leasing proposal. The agencies, however, have failed to reinitiate consultation, in ongoing violation of

¹⁸⁶ *Id.*; see also Ohio Dept. of Natural Resources, Battle for Bats: Surviving White Nose Syndrome <http://wildlife.ohiodnr.gov/speciesandhabitats/fishandwildliferesearch/whitenosesyndrome> (data showing declines in bat detection).

¹⁸⁷ United States Fish and Wildlife Service, 2017 Indian Bat (*Myotis sodalist*) Population Status Update, at 2, available at <https://www.fws.gov/Midwest/endangered/mammals/inba/pdf/2017IBatPopEstimate5July2017.pdf>.

¹⁸⁸ See USFWS, Characteristics of Indiana Bat Summer Habitat (2008), available at <https://www.fws.gov/northeast/njfieldoffice/pdf/ibatsummerhab.pdf>; Kniewski, Andrew et al., Summer Ecology of Indiana Bats in Ohio (2011), available at <https://www.dot.state.oh.us/Divisions/Planning/SPR/Research/reportsandplans/Reports/2011/Environmental/134387FR.pdf>.

¹⁸⁹ Loeb, Susan C. & Eric A. Winters, Indiana bat summer maternity distribution: effects of current and future climates, *Ecology and Evolution* 2013; 3(1):103–114, available at <http://onlinelibrary.wiley.com/doi/10.1002/ece3.440/abstract>.

¹⁹⁰ *Id.*

the ESA. 50 C.F.R. § 402.16. The following species have been designated by FWS as threatened or endangered under the ESA subsequent to the 2006 Forest Plan, and may be impacted by the projects and activities authorized by the Plan: (1) the Northern long-eared bat, designated as threatened on May 4, 2015; (2) the sheepnose mussel, designated as endangered on April 12, 2012; and (3) the snuffbox mussel, designated as endangered on March 15, 2012. The agencies, however, have not reinitiated consultation on the Forest Plan to address the potential impacts on these listed species.

For the foregoing reasons, both the DNA and the December 2016 Programmatic EA on which it relies, fail to take a hard look at the environmental consequences of the BLM's decision to offer the proposed parcels for lease, in violation of NEPA. The BLM has also failed to consult with the USFWS over the impact of its leasing decision on threatened and endangered species, such as the Indiana bat, and improperly relies on an outdated biological opinion to fulfill its consultation duties under the ESA. For these reasons, in addition to those stated above stated above, BLM may not lease the proposed parcels until an EIS, or at the very least an updated EA, is prepared to analyze the foreseeable impacts of its decision to lease the parcels, and until BLM initiates consultation with the USFWS over the impacts of its decision to lease the parcels on threatened or endangered species. Thank you for your time.¹⁹¹

Sincerely,



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¹⁹¹ The Conservation Groups submitted a copy of this protest to the Eastern States Office via fax on October 12, 2017. This hard copy has been modified slightly to add names/titles to several citations in order to make them more easily found in the CD of references included with this hard copy. The substance of the protest is otherwise identical as the copy submitted via fax on October 12, 2017.

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EXHIBIT B



September 6, 2017

Via ELECTRONIC MAIL AND FEDERAL EXPRESS

Kurt J. Wadzinski
Bureau of Land Management
Northeastern States District
626 E. Wisconsin Ave., Suite 200
Milwaukee, WI 53202
kwadzins@blm.gov

Re: Comments on Determination of NEPA Adequacy, December, 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest

Dear Mr. Wadzinski:

The Center for Biological Diversity (the "Center"), Sierra Club, Ohio Environmental Council, Sierra Club, Heartwood, the Athens County Fracking Action Network, and the Buckeye Environmental Network, write to submit the following comments on the proposed December 2017 Competitive Oil and Gas Lease Sale. The Bureau of Land Management ("BLM") Eastern States, Northeastern States District is asking the public to submit comments on a Determination of NEPA Adequacy ("DNA")¹ for the sale of parcels containing 770.61 acres of land in the Wayne National Forest, Marietta Unit of the Athens Ranger District in Monroe and Noble counties, Ohio.

Nearly all of the omissions and failures of BLM's NEPA analysis identified in our protests of the December 2016, March 2017, and September 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest ("2016 and 2017 Lease Sales") remain and provide the same bases for our protest against the September 2017 sale. Those protests are incorporated here by reference. As explained in those protests, BLM failed to prepare an Environmental Impact Statement (EIS) analyzing the impacts of competitive oil and gas leasing in the Wayne National Forest. Relatedly, BLM failed to take a hard look at site-specific and cumulative impacts of leasing in the Wayne as well as the BLM's improper reliance on the programmatic EA to analyze those impacts. Our previous protests also highlighted the failure of the BLM to consult with the Fish and Wildlife Service ("FWS") pursuant to Section 7 of the Endangered Species Act (ESA) on the impacts of leasing to threatened and endangered species present in the Wayne National Forest. Those previous comment letters also noted NEPA violations on the part of the BLM

¹ DOI-BLM-Eastern States-0030-2017-0006-DNA

when it failed to first request the Forest Service's participation in the preparation of the EA, and then subsequently by relying on the Forest Service's consent to leasing without its participation in the NEPA process. Finally, those comments highlighted the need for BLM to conduct additional NEPA analysis on the risks of spill from pipelines and other infrastructure associated with fracking in the Wayne (in particular risks associated with the Rover Pipeline currently under construction), and pointed to flaws in the BLM's evaluation of potential risks from induced seismicity from hydraulic fracturing.

The Center therefore, incorporates here by reference and attaches as exhibits our previous comment letters and written protests on the December 2016, March 2017, and September 2017 Lease Sales including all documents referenced therein.² In addition, BLM's proposed decision to lease the parcels listed above is substantively and procedurally flawed for the reasons discussed below, as well as those discussed in (1) the Center et al.'s Notice of Appeal and Petition for Stay of BLM's December 2016 Lease Sale and March 2017 Lease Sale to the Interior Board of Land Appeals ("Appeal"), and (2) the Center et al.'s 60-Day Notice of Intent to Sue Under the Endangered Species Act ("NOI"), which are also incorporated here by reference and attached as exhibits. More detailed explanations of our objections are provided in these exhibits.

A. The BLM must take into account new information from the United States Fish and Wildlife Service (USFWS) showing a dramatic decrease in Indiana Bat populations in Ohio and other states.

The USFWS recently released the 2017 Indian Bat (*Myotis sodalist*) Population Status Update.³ The Status Update provides an overview of Indiana bat population trends over time by state and region. The Status Update shows a range-wide population decline of 3.5% from 2015-2017, the most recent review period.⁴ Over that same time period Ohio has experienced a 39.9% decline in Indiana bat populations.⁵ The Status Update also shows that Ohio is not the only state experiencing dramatic bat population decline; Vermont, West Virginia, and Tennessee have seen Indiana bat populations decline by 64%, 54%, and 48% respectively over the same time period.⁶ In fact, only two of the eighteen states studied have seen increases in bat populations from 2015-2017.⁷ The DNA, and the December 2016 Environmental Assessment (EA) to which it tiers, does not consider the recent dramatic decline in bat populations in Ohio over the last two years and therefore fails to adequately address the potential impacts of fracking to weakened Indiana

² The Center et al.'s November 11, 2016 Protest of the December 2016 Competitive Oil and Gas Lease Sale, Wayne National Forest; The Center et al.'s February 13, 2017 Protest of the March 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest; The Center et al.'s July 31, 2017 Protest of the September 2017 Competitive Oil and Gas Lease Sale, Wayne National Forest; the Center et al.'s May 31, 2016 comment letter on the draft programmatic Environmental Assessment; the Center et al.'s August 11, 2016 letter to the USDA Forest Service Eastern Regional Office and Forest Supervisor; Heartwood et al.'s May 31, 2016 comment letter on the draft EA; and BEN fka BFC's January 22, 2016 scoping comments.

³ United States Fish and Wildlife Service, 2017 Indian Bat (*Myotis sodalist*) Population Status Update, (available at <https://www.fws.gov/Midwest/endangered/mammals/inba/pdf/20171BatPopEstimate5July2017.pdf>). (Hereafter "Status Update").

⁴ *Id.* at Table 3.

⁵ *Id.*

⁶ *Id.*

⁷ *Id.*

- bat populations as required by NEPA. The BLM must instead prepare and EIS, or at the very least and EA, taking a hard look at the impact of the proposed leasing on Indiana bat populations.

B. The EA must analyze the impacts of fracking on site-specific resources

1. Several waterways pass either directly through or within close proximity to the December 2017 parcels. BLM must consider site specific impacts and risks to those resources resulting from proposed drilling operations.

Maps created by the Center with data provided by the BLM indicate that several different waterways pass through, or near to, all of the nominated parcels.⁸ Parcel 1637 lies less than 0.35 miles from the Ohio River and is 0.10 miles from Jims Run, which flows into the Ohio River.⁹ Parcel 1635 lies less than 0.5 miles away from both Little Trail Run and the headwaters of Claylick Run. Next, Dogskin Run passes directly through a portion of parcel 1638, while Little Muskingum Run touches the western portion of the parcel; Walnut Camp Run passes through a portion of the parcel as well.¹⁰ Parcel 2244 lies within 0.3 miles of Long Run, and is directly adjacent to the headwaters of Rias Run; the parcel is also within 0.8 miles of the Clear Fork Little Muskingum River. Parcel 2246 is located less than 0.3 miles from Little Indian Run, and is 0.7 miles from Indian Run. Finally, Parcel 2257 is located 0.2 miles from Indian Run, 0.4 Miles from Pawpaw Creek, and is within less than 0.6 miles from an additional watercourse to the west of the parcel.

The DNA, and the December 2016 EA to which it tiers, fails to address the site-specific impacts these waterways from drilling operations in the proposed parcels. This is especially problematic given the potential for spills and leaks, as evidenced by persistent spill problems associated with the Rover Pipeline highlighted in the Center's previous comment letter submitted on July 31, 2017. The BLM must conduct an EIS, or at the very least an EA, to assess the potential site-specific impacts to the waterways identified above; this assessment should include taking a hard look at potential direct and indirect impacts of leasing on the identified waterways including, but not limited to, impacts to municipal water supplies, recreation areas (e.g., the Little Muskingum River), and special status species that may be present.

2. BLM must examine site-specific seismic risks

On April 2, 2017, an earthquake of magnitude 3.0 occurred near Sycamore Valley within the Wayne National Forest's administrative boundary. One of the lease parcels for sale, parcel 2244, appears to be roughly within two miles of the earthquake's epicenter, while parcel 2246 is located just over two miles away. See Center Map of December 2017 Lease Parcels.¹¹ As we have previously noted, BLM must analyze the potential for increased fracking and wastewater disposal in this area to cause seismic activity and mitigation measures to reduce these risks.

⁸ Center Map of December 2017 Lease Parcels; (also available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>)

⁹ *Id.*

¹⁰ *Id.*

¹¹ Center Map of December 2017 Lease Parcels; (also available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>)

3. BLM must analyze site-specific impacts on neighboring towns

The EA must analyze the impacts of fracking on neighboring communities, including Harrietsville and Sycamore Valley, which are located near parcels 2257 and 2244, respectively. The EA does not even identify that these areas could be subject to leasing, let alone analyze potential impacts to the specific parcels and these communities, such as increased truck traffic along state routes 260, 565, and 26, noise from compressor stations and drill rigs, air pollution from flaring and other oil and gas operations, and visual blight from industrialization and fragmentation of rural and forested areas. The map provided in the EA only identifies areas that had been nominated by oil and gas operators as of 2015, approximately 18,000 out of 40,000 acres of federal minerals. But that map did not identify the additional federal mineral acreage that could be subject to leasing and their locations (purportedly 22,000 acres), including parcels 2257, 2246, and 2244 offered in the December sale. Compare EA at 100, with Center Map of December 2017 Lease Parcels.¹² The EA fails to disclose that these areas could be leased and developed for oil and gas development. Residents in the Harrietsville and Sycamore Valley area therefore have never had any notice that Wayne National Forest parcels near their homes could be leased. Even the maps provided in the DNA fail to adequately notify the public, as they lack little context as to where parcels are in relation to sensitive areas, including neighboring towns and cities. Nor does the 2006 Forest Plan identify that these specific areas are open to leasing, contrary to statements in the DNA. See DNA at 4, 5.

4. BLM must identify and analyze lease stipulations for the proposed parcels

The DNA also fails to identify stipulations that would apply to the lease parcels, deferring identification of stipulations to the sale notice. This backwards process exposes BLM's flawed approach. BLM cannot presume that existing NEPA documentation is adequate without having first looked at the specific parcels, identified site-specific resource concerns, and analyzed whether stipulations are adequate to address those concerns. BLM must perform that site-specific analysis in a public NEPA process *before* offering parcels for lease.

In sum, neither the DNA nor the December 2016 EA consider the recent USFWS data showing sharp declines in Indiana bat populations in Ohio and elsewhere. Similarly, those documents do not consider site-specific impacts of fracking operations on waterways passing near or through the nominated parcels, seismicity, and local communities. For these reasons, as well as those provided in the Center et al's previous comments, protests, and other documents referenced and incorporated above, the BLM may not rely on the DNA to fulfill its obligations under NEPA to take a hard look at the environmental impacts of its decision to lease the proposed parcels offered in the December 2017 lease sale. Instead, the BLM must conduct and

¹² Center Map of December 2017 Lease Parcels; (also available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>)

EIS, or at the very least an EA, to assess the environmental impacts of the proposed December 2016 lease sale.



James Thomas Brett, Legal Fellow,
Wendy Park, Senior Attorney,
Center for Biological Diversity



Nathan Johnson, Natural Resources Attorney
Ohio Environmental Council

Myke Luurtsema, Heartwood Council Chair
Heartwood

Elly Benson, Staff Attorney,
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Andrea Reik
Athens County Fracking Action Network Steering Committee member

Teresa Mills
Buckeye Environmental Network Executive Director

EXHIBIT C

November 30, 2017

Via Electronic Delivery (e-planning online comment form)

Attn: Kurt Wadzinski
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Re: *Comments on Environmental Assessment for Rolland Applications for Permit to Drill (DOI-BLM-Eastern States-0030-2017-0008-EA, submitted by Center for Biological Diversity, Athens County Fracking Action Network, Buckeye Environmental Network, Heartwood, Keep Wayne Wild, Ohio Environmental Council, and Sierra Club*

Dear Mr. Wadzinski:

We write to comment on BLM's proposed approval of Eclipse Resources' Rolland Applications for Permit to Drill in the Wayne National Forest ("Rolland APDs"), and on the Environmental Assessment (DOI-BLM-Eastern States-0030-2017-0008-EA) ("EA" or "Rolland EA"). Eclipse Resources has proposed the development of two Utica shale horizontal wells which would drill into a federal oil and gas lease, as part of a larger project to develop seven horizontal wells on a single well pad in Monroe County. The project is entirely located within the administrative boundary of the Wayne National Forest. The overall project is likely to result in over eight months of virtually non-stop drilling and fracking in a quiet rural area surrounded by dense forest, and impact this landscape for decades with pipelines, compressor stations, noxious fumes, and the risk of toxic spills and leaks. These highly intensive industrial operations will negatively impact public health and safety, imperiled bat species and other wildlife, air quality, and water resources.

The federal lease at issue here (lease OHES-058213) is currently the subject of litigation, and BLM should refrain from approval of APDs and other projects involving federal leases in the Wayne National Forest, until the lawsuit is resolved.¹ That lawsuit challenges the adequacy of the U.S. Forest Service's and BLM's decision to open the Marietta Unit to oil and gas leasing, their approvals of the December 2016 and March 2017 Wayne National Forest lease sales, and the programmatic Environmental Assessment ("Leasing EA") and 2006 Forest Plan EIS underlying those decisions. By allowing new drilling permits before that lawsuit is resolved, BLM risks permitting wells based on an

¹ See Center for Biological Diversity et al. v. U.S. Forest Service et al., Civ. No. 2:17-cv-372 (S.D. Ohio), First Amended Complaint for Declaratory and Injunctive Relief (Dkt. 24). A CD of all references and Exhibits A-M cited herein, and a flash drive of all references cited in Exhibits A-G, have been sent to BLM's Northeastern States District Office via Federal Express.

inadequate environmental analysis that may need to be revised at a later date, and BLM risks prejudicing alternatives to issuing the leases that could be examined in a new environmental analysis. Indeed, the proposed wells and the Rolland EA demonstrate the many ways in which adverse effects of leasing in the Wayne have been swept under the rug—especially surface disturbance impacts. These adverse effects will continue to be overlooked if they are not analyzed in a new programmatic review of BLM’s leasing program in the Wayne.

In any event, the Rolland EA does not support a finding of no significant impact (FONSI), and BLM must prepare an EIS before it can approve the proposed APDs. The EA fails to provide meaningful site-specific analysis of the impacts of the proposed oil and gas operations, in spite of BLM’s assurances in the programmatic EA opening the Marietta Unit to oil and gas leasing that it would prepare such analysis at the APD stage. Specifically, the EA fails to provide a full and accurate description of the project site, project components, planned operations, and mitigation measures; and BLM has withheld the APDs from the public, including proposed conditions of approval, thereby preventing the public’s ability to understand the full scope of the project and meaningfully comment on it. The EA also improperly excludes from its environmental review other wells planned on the same well pad, despite that all wells on this pad are part of a single project by one operator to develop wells in the most cost-effective way, using the same infrastructure and facilities.

Moreover, the EA fails to fully and adequately evaluate the project’s environmental impacts, relying on conclusory and inaccurate assertions, generalized statements unsupported by site-specific data and analysis, and vague discussion of mitigation measures. Among many other deficiencies, it lacks meaningful site-specific analysis of runoff and sedimentation impacts on the Little Muskingum River and Little Witten Fork, and the risk of groundwater contamination from communication with neighboring wells. The EA entirely fails to quantify criteria and hazardous air pollutant emissions, dismissing them as “minor” even though at least seven wells are proposed to be drilled from the Rolland well pad, and at least three residences are within half a mile of the project. It fails to quantify potential noise levels from these oil and gas operations, which could affect listed bat species and surrounding residents, or to describe in any detail proposed mitigation measures to reduce noise, or their effectiveness. The EA also fails to acknowledge the full scope of truck trips that would be needed to haul away waste, although thousands of truck trips may be required. It lacks any meaningful assessment of the wildlife species that may be affected by the project, aside from two listed bat species, with no indication of whether surveys for those species have been performed. Tiering to and relying on the Leasing EA, 2006 Forest Plan Environmental Impact Statement (“2006 Forest Plan EIS”), and 2012 Supplemental Information Report (“2012 SIR”) is also improper given the many inadequacies of those environmental reviews, which we have detailed extensively. See Exhibits A-F, incorporated here by reference.

We urge BLM to withhold consideration of the permit applications until these flawed programmatic environmental reviews have been revised, and the legal challenge to BLM’s leasing approvals in the Wayne National Forest has been resolved. At a minimum, BLM should make available the APDs submitted by Eclipse and the proposed permits, and prepare an EIS, allowing the public a full and fair opportunity to review and comment on the project.

I. BLM cannot tier to the Leasing EA, and should not permit any wells or drilling during the pendency of the Wayne National Forest leasing litigation

BLM should not allow any new drill permits in the Wayne National Forest until it updates the Leasing EA to address new information revealed by the Rolland EA and APDs, and until the pending lawsuit challenging Wayne National Forest oil and gas leasing and the underlying programmatic environmental reviews is resolved. The Rolland EA validates many of the concerns that we previously raised regarding the Leasing EA and that are at issue in the pending litigation, including concerns that the Leasing EA underestimated total surface disturbance from leasing and ignored private surface impacts. The new information disclosed in the Rolland EA raises serious questions about the adequacy of the agency's programmatic NEPA review in the Leasing EA and the consistency of this and similar proposed projects with the Wayne's 2006 Forest Plan. These concerns about surface disturbance impacts have not been adequately addressed in the Rolland EA, and will continue to escape review if they are not addressed in a programmatic NEPA document. Accordingly, BLM should halt any new approvals of APDs until the Leasing EA has been revised.

BLM's surface impact figures disclosed in the Rolland EA demonstrate the inadequacy of the Leasing EA's surface impact estimates. As we have previously noted, the Leasing EA ignores significant categories of development and associated surface disturbance, which are required for horizontal well development. *See, e.g.*, Ex. B at 3-9; Ex. A at 12-21; Ex. F at 5-16. As noted in the 2012 SIR, the 2004 Reasonably Foreseeable Development Scenario (RFDS) and the 2006 Forest Plan EIS considered 272 acres of initial well site disturbance and 121 acres of disturbance after site reclamation to be the "upper limits for the first decade of the Forest Plan [2006-2016]."²

This acreage estimate was provided as the total projection for all three Wayne units. The 2016 Leasing EA breaks this estimate down further by noting that the 2004 well site acreage estimate for the Marietta Unit is 135 acres of initial disturbance and 59 acres post-reclamation.³ These estimates are for the well pad and access roads only, and do not include pipeline disturbance or other infrastructure.⁴ The Leasing EA also projects that 10 total horizontal well sites will be constructed in the Marietta Unit totaling 55 acres of initial disturbance, with 13.8 total acres of disturbance remaining after reclamation to support long-term production (5.5 pre-reclamation and 1.38 post-reclamation acres per site,

² 2012 SIR, Executive Summary, pp. 9-10:

For acres of disturbed surface, the RFDS for oil and gas projected the total acres of surface disturbed by oil and gas drilling before reclamation as 272 acres (sum of the 3 units: Athens, Ironton, and Marietta) and the total acres of surface needed to support drilled wells that are completed for production (excess disturbance reclaimed) as 121 acres (sum of 3 units)(EIS Appendix G, p G-1, also see EIS, p 3-18, Table 3-8 and p 3-262, Table 3-69). These are the acres which were the focus for analysis within the EIS and associated planning documents. Whether a vertical or horizontal well site is created, the acres described above (272 acres development and 121 production phase) were analyzed as upper limits for the first decade of the Forest Plan. (emphasis added).

³ Leasing EA at 24.

⁴ Forest Plan EIS, Appendix G, G-14-15.

respectively).⁵ According to the Leasing EA, these horizontal-well surface disturbance projections fall within the projected footprint of disturbance found in the 2006 Forest Plan, upon which the associated species and resource analyses were conducted.⁶ However, these estimates do not take into account reasonable surface disturbance estimates for “limits of disturbance” (i.e., staging areas at the well pad site), pipelines, compressor stations, and wastewater impoundments. *See, e.g.*, Ex. A at 16-21.

The Rolland EA confirms that these figures are severe underestimates. The Rolland EA notes that the existing Rolland well pad “has a short and long-term surface disturbance of approximately 4 acres.”⁷ That this well site’s footprint is the same for both the short- and long-term calls into question BLM’s basic assumption that well site surface area will shrink substantially after site reclamation. Even more troubling is the Rolland EA’s statement that “[t]he past surface disturbance from the construction of the well pad and access road, prior the federal action of drilling the proposed federal wells, affected approximately 24 acres.”⁸ The statement that a single horizontal well site affected approximately 24 acres (compared to 5.5 acres noted in the Leasing EA), seriously calls into question all of the surface disturbance projections BLM has relied on for the Wayne through several tiers of NEPA and associated documentation. At a minimum, the agency needs to further unpack this statement. While BLM has stated in an e-mail that the 24 acres represents the total surface area within the well-site boundary, it must clarify why such a large area is needed for the well site, and whether this number includes disturbance from new pipelines. According to the EA, the Rolland well pad is approximately 4 acres while the access road is approximately 0.2 acres.⁹ Potentially, the remaining 20 acres represents limits of disturbance required for construction and storage, leaving pipeline disturbance still unaccounted for. The EA must clarify these figures, and provide a breakdown of what acreage will be reclaimed in the short- and long-term.

That BLM is providing a more realistic picture of surface disturbance at the APD stage, however, does not alleviate our concerns. While the Rolland EA confirms that the Leasing EA’s surface disturbance figures have been severely underestimated, any resulting habitat fragmentation and destruction, erosion and sedimentation, dust pollution, and other surface-disturbance related impacts from the already-constructed Rolland well pad have not undergone review, as this surface disturbance from the already-constructed Rolland well pad is considered part of the baseline. *See, e.g.*, Ex. A at 17-20 & n.99, 56 (discussing fragmentation impacts and edge effects). Further, the total aggregate impact of increased surface disturbance from larger well pad sites throughout the Wayne has completely escaped public review, as well as Section 7 consultation under the ESA. BLM must analyze the impacts of larger well pad sites and the resulting cumulative impact throughout the Marietta Unit in an updated Leasing EA.

Similarly, private surface disturbance impacts have escaped public review in the Rolland EA and in the Leasing EA. The Leasing EA misleadingly suggests that oil and gas leasing in the Wayne will

⁵ Leasing EA at 24, Table 2.1.

⁶ Leasing EA at 24.

⁷ Rolland EA at 11.

⁸ Rolland EA at 40.

⁹ Rolland EA at 11.

primarily result in development of federal minerals beneath federal surface, and the development of well pads on federal surface. This is despite the fact that horizontal drilling requires large areas of minerals to be economically viable, and can occur several miles away from targeted minerals; and operators are more likely to develop on private surface in the federal-private patchwork of the Wayne, given the weaker development restrictions that apply compared to those on national forest. Despite these realities, the Leasing EA fails to meaningfully analyze potential surface disturbance impacts on private land and private mineral development impacts.

The Leasing EA suggests that such analysis would occur once “exact design details” are available at the APD stage:

Section 4.6, Cumulative Effects, also acknowledges there could be additional surface disturbance on private lands. Since exact design details are not known at the leasing stage, it is not possible to know exactly what supporting infrastructure would be needed if development occurs in the future, other than acknowledging that additional surface disturbance could occur (as identified in the EA)... Further detailed NEPA analysis would be conducted at the Application for Permit to Drill (APD) stage.

See Leasing EA at 180. But as demonstrated by the Rolland EA, these impacts can escape review at the APD stage if well pads and other supporting infrastructure are developed on private land prior to submission of the APD.

For example, the Rolland EA notes that the well pad, access road, pipeline, and power line for the Rolland wells have already been constructed, such that they are now part of the baseline, and any surface disturbance impacts from this infrastructure need not be analyzed in the EA. See Rolland EA at 14 (“BLM’s approval of drilling the well or wells into the Federal minerals is the Federal action that requires NEPA, NHPA, and ESA compliance, not the already existing well pad, access road, pipeline, power line, etc.”). The well pad, however, was only constructed right before Eclipse submitted its APD application to BLM. Eclipse Resources submitted its proposal to develop a well pad and several wells on private surface on July 20, 2017, after acquiring the federal lease in the December 2016 lease auction. ODNR approved the permits one week later on July 27. Eclipse submitted the APDs in August, but all well pad and other infrastructure construction was apparently completed before preparation of the Rolland EA. Clearly, however, without the issuance of the federal lease, development of the two Rolland wells would not be possible, and the well pad and other supporting infrastructure may not have been built. Due to BLM’s failure to analyze these surface disturbance impacts at the leasing stage, these impacts that directly result from approval of the December 2016 lease auction have escaped public review and consultation under Section 7, because BLM has now subsumed this disturbance into the baseline.

This approach is improper under NEPA. As an initial matter, construction of well pad facilities prior to APD review appears to violate BLM regulations. See 43 C.F.R. § 3162.3-1(c) (“No drilling operations, nor surface disturbance preliminary thereto, may be commenced prior to the authorized officer’s approval of the permit.”). The regulation does not distinguish between surface disturbance on private and federal surface. To the extent surface disturbance is impermissible before drilling operations

have been approved, BLM must still analyze those surface disturbance impacts as part of the proposed project. Allowing illegal activity to be grandfathered in as part of the baseline, as a means of avoiding environmental review, would perversely encourage unlawful conduct and subvert NEPA's public disclosure purpose.

Even if development of the well pad prior to drilling operations are approved was allowed under BLM regulations, BLM must still analyze the impacts of developing the well pad, as the well pad was constructed only to facilitate those wells, and without approval of the wells, the well pad lacks any independent utility. The two are inseparable. Further, this approach undermines the "heart" of NEPA: an alternatives analysis. The EA reasons that there are no alternatives to the well site, because "[t]he well pad placement would not have accommodated the two proposed wells if the pad was moved to another location and if another pad would have been built, it would have resulted in more surface disturbance."¹⁰ But only by constructing the well pad prior to submitting the APD applications did Eclipse make the present well pad location a foregone conclusion. In any case, before BLM proceeds with new oil and gas permitting, it must first revise the Leasing EA to revisit private surface disturbance impacts, as any regional, landscape-level, and basin- or forest-wide impacts of private surface disturbance will not undergo environmental review unless the Leasing EA is revised to address the aggregate surface disturbance effects of BLM's federal leasing program in the Wayne.

Finally, discrepancies between the Rolland EA and the Leasing EA's discussion of BLM's regulatory authority over well pads on private surface must be addressed in a revised programmatic environmental review and in the Rolland EA. The Leasing EA fails to forthrightly state the extent to which private surface would be subject to BLM regulation. For instance, it notes: "For leases in which the surface is privately owned and the mineral estate is federally owned, surface owner agreements, standard lease stipulations, and BMPs would potentially address many of the concerns of private surface owners."¹¹ It further states that "[w]hen federal minerals are leased by BLM, *all surface* and downhole activities must comply with federal regulations."¹² These two statements suggest that BLM lease stipulations and potentially BMPs imposed by BLM would apply to privately owned surface. In contrast, the Rolland EA states that "[b]ecause the surface of the Rolland location is not within the boundaries of the federal lease, and the wells would produce fee (privately owned) minerals along with federal minerals, BLM has limited authority over the actions that take place on the surface, including authority to impose mitigation measures (as COAs to an approved APD) pertaining to the surface management of the well site."¹³ The Rolland EA does not clearly describe what specific activities BLM can regulate, or specific mitigation measures it can and will impose. Similarly, despite BLM's apparent disclaimer of responsibility over regulating well pad construction (considering the existing well pad as part of the baseline), the ODNr well inspection log for the two proposed wells indicates that certain well pad

¹⁰ Rolland EA at 14.

¹¹ Leasing EA at 119.

¹² Leasing EA at 57 (emphasis added).

¹³ Rolland EA at 10.

construction activities are federally regulated.¹⁴ BLM must clarify its regulatory authority over well pad construction and activities, and what other federal permit requirements apply. While Appendix C of the Leasing EA describes those activities that the state regulates, there is no similar accounting of what specific activities BLM regulates. BLM only states that BLM and USFS “do not have the same permitting and regulatory powers when drilling activities are conducted on non-federal land overlying non-federal minerals as opposed to operations on federal lands.”¹⁵ But how that authority differs is still unclear.¹⁶

New information in the Rolland EA regarding potential surface disturbance impacts requires supplemental environmental review before BLM can rely on the Leasing EA for any drilling approvals. It also validates many of plaintiffs’ concerns raised in the lawsuit challenging BLM’s leasing in the Wayne. Until the lawsuit is resolved and these deficiencies in the Leasing EA are corrected, BLM should refrain from permitting the APDs or any other new wells in the Wayne National Forest.

II. BLM must identify all project components that will support the operation and production of the proposed wells, and use this information to provide a site-specific analysis

The proposed APDs cannot be approved in light of significant informational gaps in the Rolland EA regarding the proposed project and the APDs. This information is necessary to understanding the project’s environmental impacts. BLM must provide a thorough description of the project and all associated facilities, including compressor stations, gathering lines and pipelines that will service the wells. This project-specific information, which would inform site-specific analysis, is available to BLM and must be shared with the public. As detailed in Onshore Order No. 1, III. D, an operator must provide extensive detail as to its proposed operations, including a drilling plan and surface plan of operations. For example, the APD must include the following information:

- *“a map or diagram of facilities planned either on or off the well pad that shows, to the extent known or anticipated, the location of all production facilities and lines likely to be installed if the well is successfully completed for production,” including “proposed and existing flow lines, overhead and buried power lines, and water lines...”* Onshore Order No. 1, III(D)(4)(d).

→ Even if information regarding production facilities has not yet been developed, “a reasonable estimate” of those facilities is required for purposes of NEPA analysis. Given the operator’s plans here to start drilling in December, it is highly unlikely that production facilities have not already been planned. The EA lacks any discussion of the potential facilities that will be employed and the effects of their construction and operation, including flow lines and compressor stations.

¹⁴ See ODNr Inspection Log, Rolland A 2H, B 3H, 5H (Sept. 6 - Oct. 19, 2017) (“[A] Federal Drilling permit must be issued and other Federal Permit Requirements regarding the well pad construction must be met before the well’s [sic] can be spudded.”)

¹⁵ Leasing EA at 195.

¹⁶ See also Leasing EA at 45 (noting only “example[s]” of federal and state regulation available to “address any potential concerns regarding contamination or spills” without detailing specific requirements or providing full accounting of regulations); *Id.* at 121 (stating only that “federal oversight of mineral development on federal land/federal minerals is more stringent than on private land/private minerals....”).

- “[i]nformation concerning water supply, such as rivers, creeks, springs, lakes, ponds, and wells,” including “the source, access route, and transportation method for all water anticipated for use in drilling the proposed well.” Onshore Order No. 1, III(D)(4)(e).

→ It is unclear from the EA whether pipelines for transporting water to the well pad site must still be built to service the wells, or whether pipelines already exist. There is no indication of the pipeline or transportation route for water deliveries and what roads or areas will be impacted. To the extent that new infrastructure is required to facilitate water supply, BLM must analyze the impacts of its construction.

- “methods and locations proposed for safe containment and disposal of each type of waste material (e.g., cuttings, garbage, salts, chemicals, sewage, etc.) that results from drilling the proposed well,” including “plans for the eventual disposal of drilling fluids and any produced oil or water recovered during testing operations.” Onshore Order No. 1, III(D)(4)(g).

→ The EA fails to identify any specific plans for waste disposal, including the specific locations of injection wells, landfills, or other disposal sites that will be used, and the transportation route. The EA suggests that wastewater injection will not occur onsite, but fails to identify where wastewater will be transported, and the potential effects of that wastewater disposal.¹⁷ This information is relevant to understanding impacts on traffic, water quality, public health and safety, and seismicity, which the EA fails to address. See Ex. A at 64-67 (discussing seismicity impacts from wastewater injection). Ex. F at 17-20 (discussing harms from wastewater handling).

- “the location and construction methods and materials for all anticipated ancillary facilities such as camps, airstrips, and staging areas.” Onshore Order No. 1, III(D)(4)(h).

→ It is unclear from the EA where camp and staging area will be located, whether those areas have already been constructed, and how activities within those areas may affect various resources.

- A well site layout showing the location and orientation of:
 - The proposed drill pad;
 - Reserve pit/blooi line/flare pit location;
 - Access road entry points and their approximate location with respect to topographic features and with cross section diagrams of the drill pad;
 - The reserve pit showing all cuts and fills and the relation to topography.
 - Drilling rig;
 - Dikes and ditches to be constructed; and

¹⁷ Rolland EA at 12.

- *Topsoil and/or spoil material stockpiles. Onshore Order No. 1, III(D)(4)(i).*

➔ BLM has failed to provide any well site layout to the public, which is necessary to understanding effects on visual resources, noise levels, water quality, erosion, soil resources, air quality, and public health and safety.

The ODNR permit application contains other details about the proposed operations that are omitted from the EA, including:

- Eclipse has sought a variance on spacing between wells and from the unit boundary¹⁸
- The drill unit acreage is 360.821 acres or over half a square mile (for Rolland B 3H)¹⁹
- The specific drilling equipment used (RTAF)²⁰
- Wells will be separated by less than 20 feet²¹

In addition, the EA does not disclose the volumes and types of fracking chemicals and proppant that will be used to frack each well. All of this information and Eclipse's proposed drilling plan, which is also absent from the EA, bear on the safety of the project, including fire and seismic risks, and air and water pollution impacts. *See* Ex. F at 22-23 (noting studies linking fracking to earthquakes).

The Rolland EA also fails to present accurate information regarding Eclipse's proposed operations. For example, while the ODNR permits state that water for fracking operations will be drawn from Miller's Fork and Witten Fork creeks,²² the EA states that water will be drawn from the Ohio River.²³ The ODNR permit for another well that will be developed on the same pad (Roth A 2H), which was only approved on October 11, 2017, also represents that water will be sourced from these creeks and not the Ohio River.²⁴ BLM must address this discrepancy and correct any misinformation in the EA. If water will be sourced from these smaller creeks, BLM must analyze the impacts of depleting massive amounts of water from these creeks on water quality and quantity, recreational values, aquatic species and habitat, and other wildlife that depend on these creeks. The ODNR permits reveal that 7 million gallons of water could be depleted from these creeks at 300,000 gallons per day over the course of several weeks.²⁵ In addition, BLM must analyze any impacts resulting from the development of pipelines, *see* section VI below, or truck trips to transport this water, and the development of water storage facilities.

Another inconsistency relates to drilling depth. While the state permits show that total drilling depth will be up to 25,464 feet and 26,029 feet for the two wells,²⁶ the EA states that fracking will occur

¹⁸ *See, e.g.*, ODNR Permit, Rolland A 1H at 4, 13, 42.

¹⁹ *See, e.g.*, ODNR Permit, Rolland B 3H at 10.

²⁰ *See, e.g.*, ODNR Permit, Rolland A1H at 5.

²¹ *See, e.g.*, ODNR Permit, Rolland A1H at 42.

²² *See* ODNR Permit, Rolland A 1H at 10, 34; ODNR Permit, Rolland B 3H, 10, 34.

²³ Rolland EA at 11.

²⁴ ODNR Permit, Roth A 2H at 7, 10.

²⁵ ODNR Permit, Rolland B 3H at 10

²⁶ *Id.* at 34; ODNR Permit, Rolland A 1H at 34.

at depths of “9,000 feet or more.”²⁷ The EA must clarify the depths at which fracking and drilling will occur. Deep drilling techniques will require increased drilling, causing greater amounts of air pollution over longer periods of time. BLM should provide precise and accurate figures, which should be used to inform a revised air pollution, greenhouse gas, and noise analysis.

Finally, by failing to provide a list of the conditions of approval or mitigation measures that BLM will impose, the public has no way of understanding whether measures discussed in the EA will actually be required (e.g., closed loop systems, mufflers to reduce noise), and whether a finding of no significant impact may be supported. This failure undermines the intent of 40 C.F.R. § 1501.4(e)(2)(ii), which requires federal agencies to make draft FONSI s available to the public for a minimum of 30 days where the nature of the proposed action is one “without precedent.” Here, BLM has not provided a draft FONSI or the complete set of documents on which the FONSI will be based. Without publication of these materials, the public’s ability to understand and comment on potential environmental effects and how they may be mitigated is thwarted.

BLM must revise and re-circulate a new draft EA that includes a full description of the project, including proposed APD conditions, and the draft FONSI.

III. The EA Must Fully and Accurately Describe Baseline Conditions

There appear to be numerous inaccuracies and information gaps in the Rolland EA’s description of the project site, hindering the public’s ability to understand existing conditions in the project area, and precluding a full and accurate analysis of the project’s effects. For example, the permit application submitted to ODNR describes the following information that is not mentioned in the EA:

- the well pad is at an elevation of 943 feet and steep slopes are present on and around the project site;²⁸
- a well is 500 feet from the center of the well pad, but it is unclear whether this is an oil and gas or water well;²⁹
- a Witten Creek tributary crosses the project site or adjacent to it;³⁰
- “[a] very old well...in the stream [is] approx[imately] 700’ SW of center of pad,” for which Eclipse “was advised to address the potential communication with this well”;³¹ and
- a “known USDW” exists on or near the site--possibly an aquifer qualifying as a potential drinking water source protected under the Safe Drinking Water Act.³²

BLM must disclose this critical information in the EA and analyze potential impacts to drinking water and other water resources, including risks of frack hits, well communication, and surface and groundwater contamination, as detailed more extensively in the attached exhibits. *See, e.g.*, Ex. A at 23-28, Ex. G at

²⁷ Rolland EA at 11.

²⁸ *Id.* at 10, 70

²⁹ *See, e.g.*, ODNR Permit, Rolland B 3H at 4.

³⁰ *Id.*

³¹ *Id.* at 5.

³² *Id.* at 11.

17-18 (discussing potential for “frack hits,” i.e., intersection of uncontrolled fractures with existing wells). BLM must also address the condition of the surrounding wells and wells within or near the path of the proposed wellbores, including their age, whether they have been plugged, their proximity to groundwater, and other factors that could worsen the risk of harmful spills and leaks from well communication. Further, while the ODNR permit discloses the existence of wells within 500 and 700 feet of the well pad, it is unclear whether Eclipse has surveyed for abandoned or old wells farther out. Frack hits and well communication could occur within a much greater distance of the wellbore path.³³

In addition, the ODNR permit application indicates that water wells were sampled but the well locations are not disclosed in the permit application or EA--nor are the test results.³⁴ As these wells may be at risk of contamination from fracking activities and well-communication, BLM should disclose baseline water quality of the wells.

The EA mentions Witten Fork but fails to describe its location in relation to the well pad and other operations, or any potential impacts to this stream. Further, the EA does not fully or accurately describe the pristine water quality of Witten Fork, which could be used to supply water for fracking operations. The Rolland EA notes Witten Fork is “impaired for Aquatic Life Use.”³⁵ But according to Ohio EPA, Witten Fork has been designated a “Superior High Quality Water (SHQW).”³⁶ “Superior high quality waters” are surface waters that possess “exceptional ecological values.” Whether surface waters possess “exceptional ecological values” is assessed “based upon a combination of the presence of threatened or endangered species and a high level of biological integrity,” including, specifically, whether the surface waters “provid[e] habitat for Ohio or federal endangered species; provid[e] habitat for Ohio threatened species; harbor[] stable populations of a declining fish species that coincide with the presence of suitable habitat for that species, or that coincide with an essential migration path between areas of suitable habitat for that species; and display[] a level of biological integrity equivalent to the exceptional warmwater habitat index of biotic integrity or invertebrate community index criteria values listed in rule 3745-1-07 of the Administrative Code.”³⁷ Even if threatened or endangered species are not present, surface waters may be designated SHQW if they exhibit qualities of a “near-pristine aquatic habitat,” or are “ecologically unique water bodies that have essentially undisturbed native faunas.” *Id.* Water withdrawals from Witten Fork could therefore disrupt an ecologically important and sensitive area, but the EA fails to acknowledge or analyze such impacts.

Similarly, the EA describes the Little Muskingum River as an ephemeral stream, but we can find nothing to support this statement. As a major tributary of the Ohio River, the Little Muskingum River is a perennial stream. The EA also fails to acknowledge the River’s important recreational values and ecological importance, or the fact that, as an Ohio River tributary, it is a drinking water source for

³³ See Ex. G at 17 (noting uncontrolled fractures could be “of immeasurable length and uncontrollable direction”).

³⁴ See, e.g., ODNR Permit, Rolland B 3H at 10.

³⁵ Rolland EA at 37.

³⁶ Ohio Environmental Protection Agency, State of Ohio Water Quality Standards, Chapter 3745-1 of the Administrative Code, July 1, 2014 at 35 Table 5-4.

³⁷ OAC 3745-1-05 (A)(10)(b).

millions of people.³⁸ Section XIV below further discusses important attributes of Witten Fork and the Little Muskingum River.

The EA also mentions proposed wells would pass through usable groundwater, but gives no indication of the location of this aquifer(s) and how shallow or deep it is. This information is necessary to understanding the risk of uncontrolled fractures from fracking activities reaching overlying aquifers and contaminating groundwater. See Ex. A at 23-28, Ex. G at 17-18.

The Rolland EA mentions the presence of two abandoned mines near the project site, but does not provide any indication of their condition or stability, depth, or proximity to underground drilling and fracking activities. Fracking and uncontrolled fractures near these mines (and others if they exist) potentially could cause their collapse or otherwise create pathways for groundwater to enter these mines, resulting in acid mine drainage pollution. This pollution could travel through natural or manmade fractures created by the fracking process to other water sources, causing further contamination.³⁹ To the extent that drilling could destabilize these mines or create new channels for acid mine drainage, this is a potentially significant impact that the EA must address. While the EA generally acknowledges a potential risk of this sort, it fails to conduct any site-specific analysis of the specific threats involved here, taking into account the proximity of the well lateral to the mine (at the surface, one of the mines and the lateral boundary are only 0.01 mile apart), the intensity of drilling and fracking activities, the potential for uncontrolled fractures in this particular geological environment, and the location of groundwater and surface waters in relation to the mines. Nor is there any evidence that any conditions of approval or mitigation measures would somehow reduce or avoid this risk.

Finally, the Rolland EA inaccurately states that the project site is located within “rural grasslands,”⁴⁰ but the ODNr permit notes that it is located in woodlands,⁴¹ which is more consistent with the EA’s description of “dense woodlands” surrounding the project area.⁴² While the EA cites to “historic aerial imagery,” it is unclear how far back that imagery goes—much of this area of southeast Ohio was previously ravaged by logging, mining, farming, and other industrial development, but has slowly been restored over the last several decades to its natural wooded state. As a result of this inaccuracy in the EA, the EA provides a curtailed analysis of vegetation impacts, noting merely that “[d]evelopment in grasslands or prairies has less of an impact on vegetation than a forest would. Since

³⁸ Ohio River Valley Water Sanitation Commission, *The State of the Ohio River*, 3 (April 2017), *available at* http://www.orsanco.org/wp-content/uploads/2017/04/State_of_the_River_April_2017_WEB.pdf (“ORSANCO 2017”) (noting “[n]umerous public water utilities in the Ohio River Basin use the Ohio River as their source, supplying drinking water to over five million people”).

³⁹ See, e.g., Marcellus Drilling News, *EQT Drilling Causes Coal Mine Water to Leak in Mon River*, Feb. 2, 2017; Jalbert, Kirk, *Fracking in the Coalfields: Community-based Water Monitoring in Greene County, PA*, FracTracker Alliance (2017), (noting potential for groundwater pollution from cross-contamination between wastewater and migrating groundwater from abandoned mines).

⁴⁰ Rolland EA at 31, 34.

⁴¹ ODNr Permit, Rolland B 3H at 70.

⁴² Rolland EA at 32.

grassland vegetation grows quickly it is easy for them to be restored.”⁴³ The EA must correct this inaccuracy and properly analyze the project’s impacts on forest resources in the area, taking into account actual conditions.

BLM must revise the EA to present an accurate picture of baseline conditions at the project site, which is essential to understanding the proposed wells’ impacts.

IV. BLM has improperly segmented its environmental analysis

BLM has improperly limited its analysis to two federal wells, even though state drilling permits indicate that at least four federal wells (including the two at issue here) plus three others, which could also be federal, would be drilled from the same well pad. BLM should analyze all seven wells as a single project, or at minimum, all four federal wells (and any others that happen to be federal) must be analyzed as a single project. NEPA prevents an agency from dividing a single project that would otherwise require an EIS into smaller component parts, each of which individually may have a less than significant impact on the environment. A project is improperly segmented when “the proposed component action has little or no independent utility and its completion may force the larger or related project to go forward notwithstanding the environmental consequences.” *Anglers of the Au Sable v. U.S. Forest Serv.*, 565 F. Supp. 2d 812, 831 (E.D. Mich. 2008) (quoting *Hirt v. Richardson*, 127 F.Supp.2d 833, 842 (W.D. Mich. 1999)).

The EA indicates that the proposed project will authorize only two federal wells, Rolland A 1H and Rolland B 3H.⁴⁴ The EA also states that four additional *private* wells are expected to be drilled on the same well pad in the near future.⁴⁵ However, ODNR records indicate that two of the wells identified by the EA as private (Rolland C 5H and Roth A 2H) will in fact access federal minerals. All four wells will be operated by Eclipse Resources I, LP.⁴⁶ Rolland C 5H and Roth A 2H are both horizontal wells originating from the same well pad as Rolland A 1H and Rolland B 3H.⁴⁷ Rolland C 5H received a well permit from the Ohio Department of Natural Resources (ODNR) in July 2017⁴⁸; Roth A 2H was permitted by ODNR in October 2017.⁴⁹ Importantly, both well permits indicate that the United States owns a portion of the minerals that will be accessed by the wells.⁵⁰ Those federal minerals will presumably be accessed by the portions of the wells that pass under Wayne National Forest.⁵¹ Because both Rolland C 5H and Roth A 2H will access federal minerals, they are properly characterized as federal wells, and will each require an APD.

⁴³ Rolland EA at 34.

⁴⁴ Rolland EA at 5

⁴⁵ *Id.* at 25.

⁴⁶ See ODNR Well Locator, Eclipse Rolland Wells Map as of Nov. 4, 2017 (2017) (Exhibit I).

⁴⁷ Ex. I.

⁴⁸ Ohio Department of Natural Resources, Rolland C 5H Well Permit, 34-111-2-4766-00-00 (Jul. 28, 2017).

⁴⁹ Ohio Department of Natural Resources, Roth A 2H Well Permit, 34-111-2-4791-00-00 (Oct. 11, 2017).

⁵⁰ *Id.* at 12 (Roth A Royalty List); Ohio Department of Natural Resources, Rolland C 5H Well Permit, 34-111-2-4766-00-00 (Jul. 28, 2017) at 38 (Rolland C Royalty List).

⁵¹ See Center Wayne National Forest Leasing Map, available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69> (a screenshot of this map and the well pad location is attached as Exhibit M); Ex. I.

BLM, however, has impermissibly segmented its environmental analysis by limiting the scope of the EA to Rolland A 1H and Rolland B 3H. Rolland A 1H and B 3H have little independent value. Large-scale fracking operations, such as the one contemplated by the EA, require economies of scale and efficient operations, such as drilling multiple wells from a single well pad with longer laterals and reduced well spacing, to remain profitable. This is especially the case in today's market of depressed natural gas prices. Indeed, Eclipses' business strategy is heavily focused on reducing costs and intensifying fracking and extraction within a localized area. This is accomplished by developing "super laterals" spaced very tightly (150 to 200 feet apart), with up to seven wells on a single pad, and by employing higher concentrations of sand and fluid in the fracking process to maximize extraction.⁵² Without the promise of additional wells on the Rolland well pad, Rolland A 1H and B 3H would not likely be drilled, as higher capital costs per well would drastically reduce the profitability of the well pad overall.⁵³ Four wells on one pad would reduce the cost of each well to a quarter of the cost of a single well on a well pad.⁵⁴ Indeed, Eclipse Resources has obtained state permits for all four wells in the span of three months, and most likely all four wells will be drilled within the same time period to increase efficiencies. For the same reasons, it is not likely that Rolland C 5H or Roth A 2H would proceed without the prior approval of the other two wells. Because each well would not be financially justified alone, each would have little independent utility on its own. Accordingly, at a minimum, BLM must analyze the environmental impacts of all four wells in the same environmental review.

Alternatively, the four federal wells must be analyzed as "connected actions" and/or "similar actions" under 40 C.F.R § 1508.25. The scope of environmental review under NEPA includes "connected actions," which must be discussed in the same environmental review if the actions "[c]annot or will not proceed unless other actions are taken previously or simultaneously." *Id.* § 1508.25(a)(1)(ii). For the reasons stated above, the subsequent wells are unlikely to proceed without prior approval of the federal wells at issue in the EA. (While the Rolland EA repeatedly states that "not approving the APDs *may not* impact the planned drilling and producing of the proposed four wells that do not include Federal minerals,"⁵⁵ this statement suggests that the opposite "may" hold true as well—i.e., that not approving the APDs could prevent the planned drilling and producing of the other wells.) All of the wells are "connected actions" within the meaning of NEPA and must be included in the same environmental review.

"Similar actions" are defined as actions:

⁵² Eclipse Resources, Investor Presentation, 6-14 (Oct. 2017) ("Eclipse October 2017 Presentation"); *see also* Eclipse Resources, Investor Presentation, 7-15 (Nov. 2017) ("Eclipse November 2017 Presentation").

⁵³ See Marcellus Drilling News, *Utica Super Lateral Wells Now Catching On in Other Plays*, July 3, 2017, (noting that operator's plans to double well density per pad would result in "tremendous" improvement in operating efficiency and overall costs); Drilling Point, *Cost Reduction: Understanding The Economics of Multi-Well Pad Drilling*, Dec. 18, 2014 (last accessed Nov. 14, 2017) (noting multi well-pad drilling results in "massive cost savings" because "costs can be shared and spread across the wells" with savings possible in rig, labor, logistics, land damage, location, legal, and access road costs).

⁵⁴ *Id.*

⁵⁵ *See, e.g.*, Rolland EA at 27, 34, 35.

[W]hich when viewed with other reasonably foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. *It should do so* when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement.

Id. § 1508.25 (a)(3) (emphasis added). Here, all four wells are similar actions which must be analyzed in one environmental review. Because the four wells will originate from the same well pad and use the same supporting infrastructure, including pipelines and access roads, they share a common geography and would impact the same resources. It is also highly likely that because the wells will be operated by the same company, they will be drilled at approximately the same time or consecutively, to maximize efficiency in operations, which could result in more intensive effects. Accordingly, to develop an accurate picture of the combined impacts of the four wells, they must be included in a single review. BLM's improper segmented approach means that it has failed to analyze the full scope of impacts resulting from the four federal wells, including but not limited to impacts to endangered species and air quality. This is especially so given BLM's cursory cumulative effects review (addressed below), which, rather than disclosing the effects of the combined impact of all wells on the Rolland well pad, minimizes the impact of the two wells assessed in the EA in relation to the total impact of all well pad operations. BLM must analyze the environmental impacts of all four federal wells in the same environmental review as "similar actions."

Finally, a plat map included with the Roth A 2H permit indicates that, contrary to the EA, seven (not six) total wells will be drilled from the common well pad.⁵⁶ This means that there are a total of five wells originating from the well pad that are not the subject of the current APDs. It is not clear from the record whether three of the five additional wells will access federal minerals. If these wells will access federal minerals, all seven wells must be analyzed jointly as one project in the EA and cannot be separately analyzed in several segmented reviews. Even if these wells do not access federal minerals, BLM must analyze all seven wells in its cumulative effects discussion.

V. BLM must analyze the environmental impacts of the five additional wells planned for the same well pad

Regardless of whether the five additional planned wells are federal or private, their operation constitutes an indirect effect under NEPA, analysis of which must be included in the EA.⁵⁷ Large well pads supporting multiple horizontal wells (such as the well pad at issue in the EA) are much more cost-effective than a single well on a well pad, as explained in the previous section. Here, the construction of the additional wells relies on the prior approval of Rolland A 1H and Rolland B 3H to ensure that the well pad will produce enough oil and gas to be financially worthwhile, especially because natural gas prices

⁵⁶ Ohio Department of Natural Resources, Roth A2H Plat Map at 1 (Sep. 28, 2017) (the seven wells are Roth A2H, Rolland C 5H, Rolland B 3H, Rolland A 1H, Rolland E 6H, Rolland D 4H, and Rolland D 2H).

⁵⁷ See 40 C.F.R. § 1508.8 ("Effects include...Indirect effects, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.")

are low. A decision to not approve these wells could result in a smaller project with fewer wells, which could potentially be unprofitable given the high costs of developing a well.⁵⁸ Therefore, the additional wells would be an indirect effect of BLM's approval of the two federal wells assessed in the EA, and their effects must be analyzed in the EA as "indirect effects" under NEPA.

VI. BLM must analyze impacts associated with pipelines supporting the proposed wells

The Rolland EA arbitrarily and capriciously ignores gathering pipeline construction and resulting ROW openings, which would be required to service the wells. Gathering pipelines, which transport natural gas from the well to central collection points (often compressor stations), are the single largest source of surface disturbance associated with oil and gas development. However, neither the Rolland EA nor BLM's programmatic Leasing EA, nor the earlier documentation to which they both tier, meaningfully consider gathering pipelines in a review of the project's indirect or cumulative effects.

A recently published scientific study by Donnelly, *et al.* examines shale development surface impacts in Carroll County, Ohio and Washington County, Pennsylvania. It notes that:

Pipeline ROWs are the infrastructure feature type that results in the most land change accounting for more than half of the total in each of these two counties. [...] [T]he construction of pipeline ROWs is far and away the largest cause of land change associated with shale oil and gas production. [...] These pipeline ROWs are almost entirely for gathering pipelines that run from the well pads to the compressor stations.⁵⁹

BLM's 2016 Leasing EA offers only passing statements on the subject of pipeline construction, stating: "If the well produces natural gas, and the flowline is in the road, another 0.5 acres may be affected by flowline construction. [...] If the well is productive, additional land may be affected by pipeline construction."⁶⁰ The Leasing EA fails to elaborate on these statements.⁶¹ BLM's cursory treatment of gathering lines in its Leasing EA is arbitrary and capricious, particularly in light of ample evidence -- provided to BLM during the EA comment periods -- that gathering lines for horizontal well operations result in significant land clearing. According to one source, over two-thirds of the surface disturbance caused by horizontal well development in the Marcellus shale region, or about 19 acres per

⁵⁸ According to one industry report, "Well costs have declined as companies lean out operations to adjust to a lower price oil environment. One way Permian producers have decreased costs has been utilizing one surface pad with one set of facilities for multiple wells of different depths and directions. The surface facilities of the wells are expensed amongst the various well expenditures so aggregate well costs will naturally decrease as this trend increases." Merva, John, Oil Economics—How Much Does An Oil and Gas Well Cost?, Seeking Alpha, Jan. 3, 2017.

⁵⁹ Donnelly, Shannon et al., Comparing land change from shale gas infrastructure development in neighboring Utica and Marcellus regions, 2006–2015, 12 Journal of Land Use Science 5, doi: 10.1080/1747423X.2017.1331274 (2017) at 344-347 (adding, at p. 347, that "In Ohio, there is very little oversight of gathering pipelines and authorities are only involved or even aware of the location of pipelines when problems arise such as accidents that require emergency services or sensitive land cover, such as wetlands, are involved.").

⁶⁰ Leasing EA at 25 - 26.

⁶¹ While the 2016 EA does not do this, one could take the EA's "0.5 acres" flowline statement and multiply it by the EA's assumption that 10 well pads will be located in the Marietta Unit. The result would be a 5 acre estimate for total gathering line disturbance in the Marietta Unit.

well pad site, is caused by the construction of gathering pipelines.⁶² Similarly, an analysis of 122 horizontal well pads in Eastern Ohio found an average of over 17 acres of direct pipeline disturbance per well pad.⁶³ And separate, ongoing research in Eastern Ohio has found approximately 8.5 acres of gathering line clearing for every acre of well pad; in areas with relatively low well pad density, ratios have averaged up to 14:1.⁶⁴

In addition to BLM's Rolland EA and its Leasing EA, the applicable 2004 Wayne RFDS, the 2006 Wayne Forest Plan and EIS, and the 2012 Wayne SIR also fail to meaningfully account for the potential impacts of pipeline development in the large-scale horizontal shale development context—both the immediate effects of land clearing and earthmoving, and the resulting surface runoff, industrialization, habitat fragmentation, edge effects, and species impacts, in violation of NEPA. *See* 42 U.S.C. § 4332(2)(C); 40 C.F.R. § 1502.24 (agency “shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements”). The BLM's 2004 RFDS and Forest Service's 2012 SIR (the latter of which was intended to address large-scale, horizontal shale development) dismiss gathering lines out of hand and decline to consider them, stating only: “Given the long history of gas production in the WNF, there is already a well developed pipeline infrastructure in place which should minimize the need for lengthy gathering lines to service new wells.”⁶⁵ This assumption is unfounded in the context of high-volume shale development. Field studies conducted by The Nature Conservancy show that “the supporting [horizontal well] infrastructure is much larger in scale (24-inch diameter pipelines to gather gas from wells versus 2- or 4-inch pipelines in shallow fields).”⁶⁶ In the Marcellus region, gathering lines may range from 6 to 24 inches in diameter and may clear rights-of-way of 30 to 150 feet wide.⁶⁷ These are much larger than gathering lines used in shallow gas fields, which generally range from 2 to 6 inches in diameter.⁶⁸

The Rolland EA and the Leasing EA fail to account for and remedy the gathering line “hard look” deficiencies present in the pre-existing NEPA and associated documentation to which they tier. Instead,

⁶² The Nature Conservancy, *Land Use and Ecological Impacts from Shale Development in the Appalachians*, Summary Statement for DOE Quadrennial Energy Review Public Stakeholder Meeting Pittsburgh, PA July 21, 2014; *see also* Slonecker, E.T. et al., *Landscape Consequences of Natural Gas Extraction in Bradford and Washington Counties, Pennsylvania, 2004–2010*: USGS Open-File Report 2012–1154 (2012) at 26, (“Pipeline construction was the source of most of the increase in forest patch number.”) (“Slonecker 2012”).

⁶³ *See* McClaugherty, Charles et al., *Landscape Impacts of Infrastructure Associated with Utica Shale Oil and Gas Extraction in Eastern Ohio*, 100th ESA Annual Meeting (Aug. 9-14, 2015) (873 ha of pipeline divided by 122 well pad sites) (“McClaugherty 2015”).

⁶⁴ Information obtained from Ohio Environmental Council attorney Nathan Johnson's January 28, 2016 conversation with Ted Auch, PhD, The FracTracker Alliance, relating to his ongoing landscape impact research in East-Central Ohio in collaboration with Chuck McClaugherty's lab at the University of Mt. Union (examining 285 well pads and associated infrastructure); *see also* Auch, Ted, FracTracker Alliance, Letter re Land-Use Footprint of High Volume Hydraulic Fracturing in Eastern Ohio (May 2016).

⁶⁵ 2012 SIR, Appendix B at 7.

⁶⁶ Johnson, Nels, *Pennsylvania Energy Impacts Assessment, Report 1: Marcellus Shale Natural Gas and Wind*, The Nature Conservancy – Pennsylvania Chapter and Pennsylvania Audubon (2010) at 9 (“Johnson 2010”).

⁶⁷ Johnson, Nels, et al., *Pennsylvania Energy Impacts Assessment, Report 2: Natural Gas Pipelines*, The Nature Conservancy – Pennsylvania Chapter (2011) at 1 (“Johnson 2011”).

⁶⁸ *Id.*

the 2016 EA explicitly borrows and relies upon the surface impact estimates contained in those earlier documents: “This EA uses the 2006 [sic] RFDS (Appendix G of the 2006 Forest Plan/EIS) and the updated 2012 SIR for oil and gas to project the anticipated impacts of future oil and gas development in the Marietta Unit.” The Rolland EA similarly fails to consider pipeline disturbance, this time at the site-specific level. BLM is thus evading its duty to consider a major category of impact at all stages of NEPA review. This is impermissible under NEPA.

Per the 2012 SIR, the 2006 Forest Plan contemplated an “upper limit” of 50 acres total for any and all utility development (including oil and gas pipelines) proposed to cross the Wayne (36.73 acres remaining as of 2012 SIR).⁶⁹ Neither the Leasing EA nor the Rolland EA mentions or considers this utility line upper limit, or considers the extent to which new gathering lines will cross national forest land.

As former Wayne National Forest Supervisor Anne Carey noted in the 2012 SIR, an accurate surface disturbance analysis is critical because the validity of the Forest Plan and Forest Plan EIS depend on that analysis and the upper limits of disturbance considered therein. Per the 2012 SIR:

It is unlikely that, for the foreseeable future, drilling disturbance will exceed the acreage envisioned in the existing analysis. This is important, since the biological documents for the Forest Plan (EIS Appendices F1-F3) considered the effects of oil and gas activities on wildlife and plant resources up to the projected acres.⁷⁰

BLM must analyze the impacts of surface disturbance from new pipelines and gathering lines that would be required to service the new wells, and update its analysis of wildlife and vegetation impacts accordingly, including fragmentation and edge effects. Construction and operation of this infrastructure would also harm air quality, increase greenhouse gas pollution, cause sedimentation and erosion, increase the risk of spills, mar scenic views, and disturb neighboring residents. All of these issues must be addressed in an updated environmental review.

VII. The EA fails to take a hard look at potential impacts to Indiana and Northern long-eared bat populations in and near the project area.

We have submitted previous comment and protest letters highlighting the failure of BLM to take a hard look at the impact of its leasing decisions and associated oil and gas development in Wayne National Forest on the listed Indiana and Northern long-eared bats (the “listed bat species”). Specifically, BLM cannot tie to either the 2016 Environmental Assessment for Oil and Gas Leasing, Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, or Washington Counties, Ohio (DOI-BLM-Eastern States-0030-2016-0002-EA), or to the EIS for the Forest Service’s 2006 Forest Plan for Wayne National Forest. Neither document considers new information revealed by the 2017 population status update for the Indiana bat issued by the U.S. Fish and Wildlife Service (USFWS), which shows a

⁶⁹ SIR, pp. 43 and 75, Table 13.

⁷⁰ Supplemental Information Report (SIR), August 27, 2012 Letter of Anne Carey, Wayne National Forest Supervisor, RE: Review of New Information (emphasis added).

dramatic decrease in Indiana bat populations in Ohio and other states.⁷¹ See Ex. F at 25-26 (discussing population data). Nor do those documents address the impact of oil and gas development on listed bat species in light of climate change, white nose syndrome, and horizontal drilling. See Ex. F at 24-27, 33-39.

Similarly, BLM must initiate Section 7 consultation with the USFWS over potential impacts to the listed bat species, and consider the effects of the proposed well project in light of new information about declining bat populations, white-nose syndrome, horizontal drilling operations, and climate change. All of these impacts go unaddressed by both the 2005 Biological Opinion for the Forest Plan and the 2016 Wayne Leasing EA, as further outlined in the Center *et al.*'s October 2017 Protest of the December 2017 Wayne National Forest Lease Sale, which is incorporated by reference herein.⁷²

VIII. The EA fails to adequately address potential noise and wastewater impacts to threatened and endangered bat species in the project area.

The USFWS has indicated that the listed bat species may reside within the project area.⁷³ The EA also states that abandoned coal mines provide areas suitable for bat hibernation (hibernacula), and that there are two abandoned mines within the APD boundaries, one within 0.25 of the well pad and the other within 0.01 mile of one of the well laterals (measuring laterally at the surface), though the distance from the well pad is unclear.⁷⁴ Drilling operations for the proposed project are scheduled to begin in December,⁷⁵ during the hibernation period for the bats species, which occurs from November to March.⁷⁶ Bat populations are particularly vulnerable to disturbance, such as sound, during hibernation:

While hibernating, [Indiana and Northern long-eared] bats are sensitive to disturbances near their caves, because the more awake they are the more quickly their stored fat for the winter depletes, and the sooner they could die of starvation. This has become increasingly problematic for bats due to the increase of the White-nose Syndrome which is caused by a cold loving fungus.⁷⁷

Here, the EA itself states that the project area potentially contains habitat suitable for both listed bat species and locates two potential hibernacula within the project area. The EA also makes it clear that those bat species are especially sensitive to disturbance during hibernation (including presumably noise disturbance from oil and gas operations in the project area). Given the risks just highlighted, and for the

⁷¹ United States Fish and Wildlife Service, 2017 Indiana Bat (*Myotis sodalist*) Population Status Update.

⁷² See Ex. F at 33-39 (Center *et al.* Protest of December 14, 2017 Competitive Oil and Gas Lease Sale and DNA for oil and gas leasing in Wayne National Forest (Oct. 12, 2017)).

⁷³ Rolland EA at 39.

⁷⁴ *Id.* at 32-33.

⁷⁵ *Id.* at 40.

⁷⁶ *Id.* at 39.

⁷⁷ *Id.*; See also Hein, Potential impacts of shale gas development on bat populations in the northeastern United States. An unpublished report submitted to the Delaware Riverkeeper Network, Bristol, Pennsylvania by Bat Conservation International, Austin, Texas (2012) at 11 (discussing depleted fat reserves and/or roost abandonment effects of winter hibernation disturbance).

reasons set forth below, the EA fails to take a hard look at noise impacts resulting from the proposed project. In addition, BLM must take a hard look at the potential for harm to listed bat species resulting from wastewater storage pits, which are allowed under Ohio law. BLM must also consult with USFWS to ensure that the project does not jeopardize the continued existence of the listed bat species.

i. BLM's analysis of noise impacts on the listed bat species is flawed.

The scope of BLM's analysis of expected noise levels is impermissibly limited. The EA notes various noise levels associated with oil and gas equipment/operations up to a distance of 50 feet.⁷⁸ The EA does not, however, detail what equipment will be used at the project site and what the noise level will be at the potential hibernacula located just 0.25 miles away from the project area. Given the possibility that bat populations are located more than 50 feet away from the project area but nonetheless in close proximity, including at the potential hibernacula referenced above, BLM's analysis is too limited. BLM should instead detail what noise levels will be at least at a range of 0.25 miles from the project area, where the abandoned mines are located. In addition, another abandoned mine is mentioned in the EA (located 0.01 miles from the boundary of a proposed well lateral at the surface), but it is unclear where this mine is located in relation to the well pad, and whether it contains hibernacula. BLM must identify the mine's location and its potential to provide suitable bat habitat.

Highlighting the need for noise analysis beyond 50 feet, the EA notes that USFWS "advises a quarter-mile buffer around the hibernaculum for any audible disturbances."⁷⁹ No citation or evidence in the EA supports this claim. Furthermore, site-specific analysis addressing the particular activities, noise levels, and species involved here is required before BLM can assume that a quarter-mile buffer is sufficient to address noise impacts.

The EA goes on to maintain that regardless of the noise pollution resulting from operations associated with the proposed project, "[i]f the disturbance is around the clock, such as during well drilling and completion activities, the bats will adjust to the noise and perceive it as ambient."⁸⁰ This statement is unsupported by any evidence or citation, and therefore cannot form the basis for a finding of no significant impact. The EA also states that bats will simply relocate if bothered by sound.⁸¹ As mentioned above, however, it is precisely this additional movement during hibernation that causes the hibernating bats to deplete their winter fat stores and that poses a major threat to their survival. The possibility that affected bats may re-locate in response to sound disturbances cannot be used to downplay potentially significant effects of sound pollution on listed bat species in the area; the disturbance and movement of hibernating individuals itself causes harm, posing a potentially significant impact on these species that are already under extreme pressure from climate change, white-nose syndrome, steep population declines, and habitat destruction.

⁷⁸ Rolland EA at 31.

⁷⁹ *Id.* at 32.

⁸⁰ *Id.*

⁸¹ *Id.*

Even outside the context of impacts to the listed bats during hibernation, BLM fails to explain or analyze how forcing non-hibernating /roosting bats to relocate due to noise pollution is not a significant impact. Forcing bats to abandon their roost can have severe consequences “if young are abandoned at a maternity roost, predation increases, or there is a loss of access to important nearby foraging or alternative roosting areas.”⁸² Even if bats do not relocate, noise pollution may force individuals to:

invest...time and energy in vigilance behavior—time and energy often redirected from other critical behaviors such as care of young, foraging, rest, and proper thermoregulation...This vigilance is also normally accompanied by varying levels of stress that can potentially result in dysfunctional behaviors and/or changes in important physiological and hormonal conditions that may...affect the survival and well-being of individuals and colonies.⁸³

The EA points to observed bat roosts adjacent to popular ATV trails in Wayne National Forest to suggest the non-significant nature of sound impacts to roosting bats.⁸⁴ This does not address potential disturbance to hibernating (i.e. non-roosting) bats due to noise impacts highlighted above; nor does it address additional impacts of noise pollution on bat species, such as stress impacts (highlighted above), as well as impacts to the ability of bats to forage for food (addressed in more detail below). Finally, there is no indication as to what time of year the bats were observed near the ATV trails, how frequently this has been observed, whether the noise impacts from 24-hour drilling is qualitatively similar to occasional ATV disturbance, or whether the trail had recently been used prior to observing the roosts. The mere presence of roosting bats adjacent to ATV trails without any further explanation backed by expert opinion and factual support cannot be used to show a non-significant impact on the listed bat species.

Finally, the EA fails to analyze additional impacts to the listed bats besides potential disturbance during hibernation and roosting. Studies have shown that anthropogenic noise and light pollution, including pollution associated with natural gas extraction, can impair the ability of bats to forage for food; this is true for bat species that utilize echolocation to hunt as well as species that forage by listening for prey sounds.⁸⁵ BLM must analyze impact to listed bat species in the area in addition to hibernation disturbance, including foraging impacts.

⁸² California Department of Transportation, Technical Guidance for Assessment and Mitigation of Traffic Noise and Road Construction Noise on Bats (July, 2016) at 62-63.

⁸³ *Id.* at 63.

⁸⁴ Rolland EA at 32

⁸⁵ Legakis et al., Survey of the bats of the Athens metropolitan area, 38 *Myotis* (2000) 41–46; Schaub et al., Foraging bats avoid noise, 211 *Journal of Experimental Biology* (2008) 174–3180; Francis et al., Noise pollution alters ecological services: enhanced pollination and disrupted seed dispersal, 279 *Proc. R. Soc. B.-Biol. Sci.* (2012) 2727–2735; Siemers, B.M. & A. Schaub, Hunting at the highway: traffic noise reduces foraging efficiency in acoustic predators, 278 *Proc. R. Soc. B.-Biol. Sci.* (2011) 1646–1652; Jones, G., Sensory Ecology: Noise Annoys Foraging Bats, 18 *Current Biology* 23 R1098-R1100 (2008); *See also* Kiviat, E., Risks to biodiversity from hydraulic fracturing for natural gas in the Marcellus and Utica shales, 1286 *Annals of the New York Academy of Sciences* 1 (2013) at 5.

II. BLM relies on flawed mitigation to avoid finding a significant impact on the listed bat species and neighboring residents

BLM states that potential noise impacts to listed bat populations and humans in the project area will be mitigated because “[t]he operator will muffle equipment to reduce equipment noise.”⁸⁶ First, there is no indication that the operator will be *required* to muffle equipment used during drilling operations; as such, those measures cannot form the basis for a finding of no significant impact. Second, the EA gives no analysis of projected noise levels from oil and gas operations, expected noise reductions that will result from the muffling activities, or the noise threshold at which bats are disturbed. Without that information it is impossible to evaluate the mitigating effect that the muffling activities will provide to the listed bat species in and near the project area. What equipment will be muffled and using what measures? Will that result in noise impacts below those outlined previously in the EA at the bottom of page 31? Are those reductions sufficient to reduce impacts on hibernating or roosting individuals to less than significant levels? The failure to address these questions amounts to a failure to take a hard look at the environmental impacts of the proposed action as required by NEPA. Along similar lines, BLM’s conclusory statement that “the indirect impact of the noise from drilling and completion activities will be decreased by dense woodlands surrounding the residences and outside of the abandoned coal mine”⁸⁷ lacks any quantitative analysis as to how much noise will be reduced and whether such reductions would fall below harmful levels.

BLM also relies on compliance with the Cave Protection Act of Ohio Revised Code section 1517 to ensure the protection of hibernating bats. That statute, however, is not applicable to bat populations hibernating in abandoned mines. The act states that an individual cannot knowingly, and without the permission of the owner of a cave, “[r]emove, kill, harm, or disturb any cave life found within a cave.”⁸⁸ However, the act defines “cave” as a “*naturally occurring* void, cavity, recess, or system of interconnecting passages beneath the surface of the earth or within a cliff or ledge....”⁸⁹ There is no evidence that the abandoned coal mines referenced above are naturally occurring. Indeed, as caves formed for purposes of coal mining, they appear to be outside of the protections provided by the Cave Protection Act. Nor is there any indication of steps that Eclipse Resources has taken to ensure compliance with this law if it applies. Section 1517 cannot provide the basis for a finding of no significant impact to potential bat populations that use the abandoned mines identified above for hibernation.

iii. BLM’s analysis of the cumulative effects of noise pollution on the listed bat species is flawed.

BLM states that the federal wells will only contribute “minimally” to the cumulative effects of the project given that the four private wells will proceed with or without approval of the APDs.⁹⁰ This

⁸⁶ Rolland EA at 40.

⁸⁷ *Id.* at 32.

⁸⁸ Ohio Rev. Code Ann. § 1517.24.

⁸⁹ Ohio Rev. Code Ann. § 1517.21 (emphasis added).

⁹⁰ Rolland EA at 40.

analysis misses the point of the cumulative effects analysis required under NEPA. A cumulative effects analysis requires consideration of impacts that may be individually insignificant, but which when taken in proper context with other past, present, and reasonably foreseeable actions (whether federal or private) have a significant impact.⁹¹ BLM must consider the impacts of drilling operations associated with the two proposed wells *and* the other five planned wells, which the EA concedes are reasonably foreseeable.⁹² BLM cannot eschew its responsibility to evaluate the *combined* effects of the federal and private wells, and any other projects in and around the Wayne, by downplaying the incremental impact of the federal wells. In fact, the cumulative effects analysis under NEPA is designed to avoid such a result. Even assuming BLM's basic approach to the cumulative effects analysis is appropriate, the project's contributions will be anything but minimal. Instead, authorization of the federal wells will increase the number of wells drilled and associated impacts by 40%.⁹³ This will substantially increase noise resulting from the project and/or prolong the duration of associated noise disturbances to hibernating bat populations.

iv. BLM fails to consider private surface wastewater pits at either the programmatic or site-specific levels.

As noted above, BLM has failed to provide any details as to how Eclipse Resources intends to store, handle, and dispose of wastewater. To the extent Eclipse intends to construct and use wastewater pits or ponds for the storage and treatment of wastewater, the operation of these facilities could kill or harm Indiana bats and Northern long-eared bats. Several studies document the fact that oil and gas wastewater pits pose a significant risk to migratory birds and other wildlife, including bats.⁹⁴ Insects that become trapped on the surface of these pits attract bats, which may then become exposed to toxic chemicals, or end up tangled in netting covering the pits' surfaces.⁹⁵

The entirety of the Wayne's existing NEPA documentation dating back to 2004 fails to provide a hard look at the significant wildlife risks posed by oil and gas wastewater pits. The 2012 SIR (a non-NEPA document) even states that the 2004 RFDS described the handling of hydraulic fracturing fluids in a closed system, and that "the exposure of TES wildlife species to those fluids was [therefore] not anticipated or analyzed."⁹⁶ The SIR itself largely dismissed the issue of wastewater pits, because it suggested that they would not be allowed on federal surface. Specifically, the SIR states that the Wayne's 2006 Forest Plan provides the Forest Service with the flexibility needed to require "closed

⁹¹ See 40 CFR § 1508.7.

⁹² See Rolland EA at 40 ("[The] four additional private wells would still be drilled, even if the APDs are not approved.").

⁹³ 2 wells/5 other wells = 40%

⁹⁴ See, e.g., Ramirez, Pedro, U.S. Fish and Wildlife Service Region 6, "Migratory Bird Mortality in Oil and Gas Facilities in Colorado, Kansas, Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming" (Feb. 2013), available at: <https://www.fws.gov/mountain-prairie/contaminants/papers/R6726C13.pdf>.

⁹⁵ Ramirez, Pedro, U.S. Fish and Wildlife Service, "Reserve Pit Management: Risks to Migratory Birds" at 9 (Sept. 2009), available at

<https://www.fws.gov/migratorybirds/pdf/management/reservepitmanagementriskstomigbirds.pdf>.

⁹⁶ 2012 SIR at 47.

systems” instead of pits on federal surface.⁹⁷ However, Ohio law allows for the long-term use of wastewater storage pits on private surface. Specifically, Ohio law allows for the continuous use of wastewater pits during the producing life of a well, so long as pits are periodically drained (at least every 180 days). Ohio Administrative Code (OAC) § 1501:9-3-08; Ohio Revised Code (ORC) § 1509.22(C)(4).⁹⁸ The leasing and horizontal development of federal minerals could therefore lead to or increase wastewater hazards for bats and other wildlife on nearby private surface.

Despite the considerable risks that wastewater pits pose for listed bats, the Rolland EA arbitrarily and capriciously fails to provide any analysis of these pits, which could be used on- or offsite. In fact, the Rolland EA fails to even mention whether or not the operation in question will use wastewater storage pits. For its part, the Leasing EA refers to the 2012 SIR’s claim that closed systems would be required on federal surface.⁹⁹ However, the Leasing EA fails to meaningfully consider the potential impacts associated with wastewater pits on private surface, stating only in passing that “ESA considerations may also dictate additional storage requirements such as prohibition of open pits.”¹⁰⁰

BLM must take a hard look at the significant risks wastewater pits pose to listed bat species, both at the leasing and APD stages. To date, BLM has arbitrarily and capriciously failed to do so at both stages.

v. *BLM must consult with USFWS to ensure that the project will not jeopardize the continued existence of the Indiana bat and Northern long-eared bat.*

Finally, there is no indication that BLM has consulted with USFWS over potential impacts to the listed bat species resulting from the proposed action, or from previous BLM leasing decisions. BLM must “review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat. If such a determination is made, formal consultation is required.”¹⁰¹ The potential presence of the listed bat species and hibernacula within and near the project area satisfies the low “may affect” standard requiring consultation; “may affect is a relatively low threshold for triggering consultation.... *Any possible effect*, whether beneficial, benign, adverse or of an undetermined character, triggers the requirement.”¹⁰² BLM must initiate formal consultation with USFWS to evaluate the impacts of the proposed project on the listed bat species. To the extent that such consultation is already ongoing, BLM should make available all consultation documents publicly available, which are necessary to understanding whether the proposed activities will avoid significant effects on the listed bats.

⁹⁷ 2012 SIR at 47.

⁹⁸ Ohio law also allows for temporary reserve pits for the storage of drilling and well stimulation wastes. ORC § 1509.072. These reserve pits are to be closed within two months of well completion in non-urbanized areas. ORC 1509.072(A). However, this two-month operating period may be extended by up to six or more additional months if certain conditions are satisfied. ORC § 1509.072.

⁹⁹ Leasing EA at 97 and 100.

¹⁰⁰ Leasing EA at 201.

¹⁰¹ 50 C.F.R. § 402.14.

¹⁰² *Karuk Tribe of California v. U.S. Forest Serv.*, 681 F.3d 1006, 1027 (9th Cir. 2012) (internal quotations and citations omitted).

IX. The EA fails to analyze impacts to wildlife other than the listed bat species.

The EA's discussion of wildlife impacts resulting from the proposed project is limited only to potential impacts to the listed bat species.¹⁰³ Numerous species populate the Wayne National Forest, including rare species such as Cerulean warbler, bobcat, river otter, and eagles.¹⁰⁴ The EA fails to detail what other wildlife is present within and near the project area, and does not consider whether the potential effects to the listed bat species highlighted above also implicate significant impacts to other wildlife in the area. This includes potential disturbances resulting from noise and light pollution from oil and gas operations, as well as truck noise and collisions resulting from the high volume of trucks required to haul away waste produced by the drilling operations (discussed in more detail below).

Nor is there any description of aquatic species that depend on streams near the project area, which could be impacted by spills and leaks from trucks, tanks, pipelines, and other operating equipment. BLM must also analyze whether habitat for the host fish of two endangered mussels that reside in the Ohio River downstream from the Marietta Unit--the pink mucket pearly mussel and fanshell--is present in these areas, and, if so, consult with USFWS on the project's impacts on the host fish and the endangered mussels.

There are 9 host fish for the fanshell, including mottled sculpin (*Cottus bairdi*), banded sculpin (*Cottus carolinae*), greenside darter (*Etheostoma blennioides*), snubnose darter (*Etheostoma simoterum*), banded darter (*Etheostoma zonale*), tangerine darter (*Percina aurantiaca*), blotchside logperch (*Percina burtoni*), logperch (*Percina caprodes*), and Roanoke darter (*Percina roanoka*).¹⁰⁵ According to the 2006 Forest Plan EIS, "[t]he greenside darter, banded darter, and logperch could potentially travel between the Ohio River and WNF streams. It is unlikely that these host fish would contribute to the colonization of sites within the WNF since habitat is not suitable, but these host fish could play a role in the life cycle of the fanshell when occupying sites in the Ohio River."¹⁰⁶ Several fish also play a role in the lifecycle of the pink mucket pearly mussel, including largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), and walleye (*Stizostedion vitreum*), sauger (*Stizostedion canadense*), and freshwater drum (*Aplodinotus grunniens*).¹⁰⁷ The black basses, sauger, and freshwater drum are found within watersheds of the Wayne National Forest that are not impacted by acid mine drainage.¹⁰⁸ Accordingly, any impacts to these fish species could also harm the endangered mussels that depend on these fish.

By limiting its analysis of wildlife impacts to the listed bat species, BLM has failed to take a hard look at the environmental effects of the proposed project.

¹⁰³ Rolland EA at 39-40.

¹⁰⁴ See, e.g., U.S. Forest Service, Wayne National Forest, Watchable Wildlife; U.S. Forest Service, Wayne National Forest, Resource Management.

¹⁰⁵ 2006 WNF Forest Plan EIS at 116.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at 128.

¹⁰⁸ *Id.* at 129.

X. BLM must conduct surveys of potentially affected wildlife in and near the project area, including of the listed bat species, to determine the impacts of the project.

Nothing in the EA indicates that BLM has conducted surveys of potentially affected wildlife in and around the project area, such as the listed bat species. This includes a failure to survey or investigate the noted abandoned coal mines which are potential hibernacula located just .01 and 0.25 miles from the project site; indeed, the EA states that “[t]here is little to no information regarding the conditions of these mines, the depth, or the size of them as they have been abandoned for 68-143 years.”¹⁰⁹

BLM has provided no explanation as to why wildlife surveys generally, and surveys of the abandoned mines within the project area specifically, are not feasible. An agency’s failure to conduct surveys of potentially impacted wildlife results in an insufficient baseline and constitutes a failure to take a hard look at the environmental impacts of a proposed action as required by NEPA. *N. Plains Res. Council, Inc. v. Surface Transp. Bd.*, 668 F.3d 1067, 1085 (9th Cir. 2011). *N. Plains Res. Council* holds that an agency decision to approve the construction of service railroad lines for a coal mine without first conducting sage grouse and fish / fish habitat surveys resulted in an inadequate baseline analysis for the project and violated NEPA’s hard look requirement. *Id.* The fact that portions of the land to be surveyed were located on private land did not excuse the agency’s failure where the agency had made no effort to contact the private land owners about access to the property. *Id.* Without those surveys, the agency could not satisfy the dual aims of NEPA to ensure: (1) that the action agency carefully consider the environmental impacts of its decision, and (2) that sufficient information is provided to the public to allow for meaningful participation in the decision making process. *Id.*

Approving the proposed project without first conducting surveys of potentially affected wildlife results in inadequate baseline information by which BLM can evaluate the impacts of its decision, and violates NEPA’s hard look requirement. This is especially so for the listed bat species, which USFWS notes may be present in the project area and which may be found at potential hibernacula near the well site. BLM must conduct surveys of potentially affected wildlife, including the listed bat species, and investigate any and all abandoned mines or caves in and around the project area that may provide potential bat hibernacula.

XI. BLM’s analysis of noise impacts on neighboring residents and recreation is deficient

For similar reasons discussed in section VIII above, BLM’s analysis of noise impacts on neighboring residents is also flawed. In addition, that analysis fails to address the duration and timing of these activities. As the EA acknowledges, noise is more impactful at night, but the EA fails to address whether operations will occur during the evening or sleeping hours, or for how many hours out of the day. It also fails to address how long noisy operations could endure. Given that seven wells are planned for the well pad, and that drilling and fracking are estimated to take 35 days to complete per well,¹¹⁰

¹⁰⁹ Rolland EA at 33.

¹¹⁰ Rolland EA at 12.

drilling and fracking could occur for a period of over eight months uninterrupted. Similarly, it is unclear how frequently, at what time of day, and for how long trucks could come in and out of the project area, as well as how near they would pass by neighboring residents. The EA also fails to address potential noise impacts on quiet recreation on the Little Muskingum River, which is only 0.25 mile away from the well site.

Generators and compressor stations serving the well pad may also pose potential noise hazards, but because the EA has failed to address the location and plans for these and other equipment, or to quantify their noise levels, it is impossible to assess potential noise effects on residents. At least one study has shown that residents living near a compressor station are potentially exposed to noise levels that are higher than the recommended U.S. EPA levels of 55 dBA (outdoor/daytime) and 45 dBA (indoor/night time).¹¹¹ The study found that five out of six homes within 750 meters (0.466 miles) of a compressor station experienced outdoor average sounds levels greater than 55 decibels over a 24-hour period. Thus, noise from compressor stations could pose significant effects on neighboring residents, but the EA fails to analyze this issue.

XII. The EA's analysis of Transportation and Access impacts is flawed and incomplete

The analysis contained in Section 3.7 of the EA on transportation and access impacts is too limited and ignores major transportation impacts that will result from the proposed project, including the transport of waste away from the project site. Instead the EA limits its analysis to impacts of trucks used to transport water to the project:

Trucks will be traveling an average of 32.8 miles per trip to transport water taken from the Ohio River from Powhatan Point to the well pad. Large water trucks typically hold capacities ranging from 5,500-11,600 gallons; therefore, these tankers will be traveling 59-125 miles.¹¹²

The estimated truck traffic provided by the EA above seems to be based only on the water demand for camp use and well casings. However, this is far from clear as the EA fails to state how much water will be transported to the site by truck, how that water will be used, or how BLM arrived at the 59-125 mile figure. BLM must first clarify these points in order to adequately inform the public on the potential impacts of the action.

Regardless, there are numerous other transportation and access issues that the EA totally ignores. Most notably this includes transportation needs associated with hauling away drill cuttings, equipment, produced water, sewage and garbage, which the EA states will be hauled off site,¹¹³ as well as those associated with the transport of all equipment, fracking chemicals, and proppant (e.g., sand) required to construct the well pad and to drill the federal wells.

¹¹¹ Boyle, Meleah D., et al., A pilot study to assess residential noise exposure near natural gas compressor stations, 12 PLoS ONE 4: e0174310 (2017).

¹¹² Rolland EA at 35.

¹¹³ *Id.* at 12.

A rough estimate of the number of trucks required to transport wastewater from the project site alone highlights the inadequacy of the EA's transportation and access analysis. The number of truck trips required simply to transport wastewater produced by the federal wells off-site would range from a low of approximately 500 to a high of nearly 1,200 additional trucks. Estimating this range is simply a matter of dividing expected wastewater produced from the federal wells by the carrying capacity of the trucks that could haul that waste off-site. A recent FracTracker Alliance report estimates that roughly 11-12% of freshwater used for well drilling, production, and completion returns as waste.¹¹⁴ If 11% of freshwater used for the two proposed wells returns as waste, then a total of 6,466,187.24 gallons of wastewater will have to be hauled off site.¹¹⁵ Dividing both of the carrying capacity estimates for water trucks provided on page 35 of the EA into the projected wastewater volume above shows that anywhere from 557 to 1,175 trucks will be required to haul away wastewater alone. Taking into account all 7 planned wells, 1,946 to 4,113 trips will be required to haul all wastewater offsite. These figures, however, do not take into account produced water that also returns to the surface. Moreover, solid waste will have to be transported offsite, resulting in many more truck trips. In southeast Ohio, drill cuttings are a massive source of waste, averaging 600-720 tons per lateral.¹¹⁶

Here, Section 3.7 of the EA completely ignores the significant transportation demand required to haul waste products off-site and to transport materials and equipment to and from the project site, precluding an accurate analysis of impacts on roads, soil erosion, traffic, runoff pollution, air quality, native vegetation, and public safety hazards. For example, with increased truck trips there will be a greater risk of accidents and hazardous spills on steep, narrow, and winding roads found in the Appalachian foothills, increased diesel particulate and dust pollution, more polluted runoff, greater risk of invasive species infestation, and increased wear and tear of public roads. Further, some of these impacts could occur in the Wayne National Forest, or impact forest resources, but because the transportation routes are not disclosed, it is entirely unclear. This constitutes a failure to take a hard look at the transportation and access impacts of the proposed action in violation of NEPA.

i. The EA also fails to take a hard look at increased truck traffic on the listed bat species and other wildlife in and near the project area.

Relatedly, the EA's analysis of truck impacts on the listed bat species and other wildlife is either cursory or non-existent. The EA totally ignores potential collisions between trucks and wildlife in and near the project area, including the listed bat species. Similarly, the EA only estimates/considers noise pollution impacts to the listed bat species originating from the drilling site, and ignores noise pollution resulting from trucks driving to and from the project site. Indeed, the noise level estimates for equipment required for oil and gas operations found at page 31 of the EA does not include truck noise

¹¹⁴ Auch, Ted, The Freshwater and Liquid Waste Impact of Unconventional Oil and Gas in Ohio and West Virginia, FracTracker Alliance (2017) at 8 ("[Auch 2017](#)").

¹¹⁵ Using an acre-foot to gallon conversion factor of 325,851 gal/acre-foot, our calculation is based on the following: 180.4 acre feet of water used for both federal wells multiplied by 325,851 gallons, and again multiplied by 0.11.

¹¹⁶ Auch 2017 at 15.

estimates. BLM must take a hard look at the impact of increased truck traffic on the listed bat species as well as other wildlife in and near the project area.

XIII. BLM's Analyses of Air Quality and Greenhouse Gas Emissions are Deficient and Violate NEPA.

1. *The EA Failed to Provide Quantitative Analysis for Criteria Air Pollutants*

Oil and gas operations emit large amounts of air pollution, including multiple “criteria” air pollutants for which EPA has set National Ambient Air Quality Standards (NAAQS) due to their potential to cause primary and secondary health effects. 40 C.F.R. § 50.2. Concentrations of these pollutants—ozone, particulate matter (PM), carbon monoxide, nitrogen oxides (NO_x), sulfur dioxide (SO₂) and lead—will likely increase in regions where unconventional oil and gas recovery techniques are permitted. The EA for the Rolland APDs does not include any quantitative analysis of these criteria pollutants or analyze the emissions in conjunction with potential present and future emissions from existing and planned oil and gas development projects. For example, BLM failed to provide data or monitoring reports that reflect pollutant levels and whether they meet the NAAQS. The EA should include monitoring data for the past 3-5 years for each criteria pollutant. 40 C.F.R. §§ 50.6, 50.7. BLM failed to adequately analyze direct, indirect, or cumulative impacts from increased ozone and other pollution in the area based on the drilling equipment and processes identified in the Rolland APDs. In fact, the Wayne National Forest programmatic oil and gas EA repeatedly guarantees that a comprehensive air quality analysis will be completed at the APD stage, because the equipment and drilling methods are certain and verifiable once a drilling project is proposed.¹¹⁷ However, BLM fails to quantify these emissions at the drilling proposal stage, and also fails to identify proper and specific mitigation measures to control air pollution emissions at the project development stage, despite BLM’s repeated promises to conduct a thorough analysis when a drilling project is proposed. BLM’s bare statement that the proposed wells “would produce minor quantities of particulate matter..., gas emissions, and ozone forming compounds from any of the direct emissions sources” is totally unsupported.¹¹⁸

Here, BLM failed to take the requisite hard look at the direct, indirect and cumulative air quality impacts of increased criteria pollutant emissions likely to result from development of the Rolland wells. Although BLM acknowledged that pollutants can be quantified and cites to Tables 3 and 4 in the Rolland EA to demonstrate quantification of greenhouse gas emissions, there is no analysis of criteria pollutant emissions quantities cited anywhere in the EA. BLM simply provided a table of estimated GHG emissions and does no more.¹¹⁹ Nor can BLM tier to the Leasing EA for the Marietta Unit, which also fails

¹¹⁷ U.S. Department of the Interior, Bureau of Land Management, Northeastern States District Office, Environmental Assessment Oil and Gas Leasing, Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, and Washington Counties, Ohio, DOI-BLM-E5-0030-2016-0002- EA, (“EA”) at 4, 27, 38, 81-96.

¹¹⁸ See Rolland EA at 22.

¹¹⁹ *Id.* at 23-24.

to quantify criteria pollutants. BLM seems to confuse requirements for quantifying criteria pollutants with quantifying greenhouse gases in both the Rolland EA and Leasing EA.¹²⁰ Quantifying GHGs is not the same thing as quantifying criteria pollutants. Nor can a GHG analysis be considered a substitute for a full criteria pollutant analysis to establish compliance with the NAAQS. There is no reason why BLM cannot perform this analysis at the APD stage, when the well location, equipment, and drilling processes have been clearly identified as a part of the application.

BLM's failure to quantify emissions and identify mandatory environmental impact mitigation methods for controlling air pollution emissions in the EA violates a key pillar of NEPA review, to disclose significant environmental impacts from the federal action. 40 C.F.R. § 1508.25; *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)). In determining whether an action will have a significant environmental impact, BLM should have, at a minimum, assessed whether existing air quality would be degraded with the additional development. In conducting its NEPA review, BLM must consider "unique characteristics of the geographic area," such as air pollution and ozone level statistics. *S. Utah Wilderness Alliance v. Allred*, 2009 U.S. Dist. LEXIS 30664, *6 (D.D.C. 2009) (holding plaintiffs showed likelihood of success as to their NEPA claim because BLM, in failing to engage in quantitative ozone dispersion modeling, could not adequately measure those pollutants which are expressed in ambient concentrations.).

BLM fails to take a hard look at the direct impacts of the project development on air quality as required by NEPA. Direct effects "are caused by the action and occur at the same time and place." 40 C.F.R. § 1508.8(a). Accordingly, because development of the APDs will result in air emissions within a half mile of several homes and within two miles of a school,¹²¹ and because the Clean Air Act limits short-term exposure levels of these pollutants to protect public health, BLM is required to consider the impact of these additional emissions on air quality. Likewise, BLM failed to take a hard look at the direct impacts of Hazardous Air Pollutants (HAPs) from the project, and only briefly mentions that HAPs are regulated by the US EPA.¹²² The Ohio Environmental Protection Agency is conducting air toxics monitoring for hydraulically fractured wells in Muskingum County, establishing a baseline for numerous air pollutants, including the family of HAPs emitted by oil and gas drilling and operations.¹²³ This study is not cited, analyzed or used in any way to establish the direct environmental impacts from HAPs emissions from the specific Rolland wells, despite the readily-available data in a neighboring well location utilizing similar extraction technology. Exposure to HAPs can pose serious and localized health effects as discussed in detail in the below section (XIII.1.a).

¹²⁰ *Id.* See also, Wayne National Forest Environmental Assessment Oil and Gas Leasing, DOI-BLM-E5-0030-2016-0002- EA, ("EA") at 82-94.

¹²¹ Center for Biological Diversity, Rolland Well Satellite Image Map (November 2017) (Exhibit L); see also Rolland EA at 32 (noting three residences are within half mile of well pad); Center Online Wayne National Forest Leasing Map, available at <http://center.maps.arcgis.com/apps/View/index.html?appid=0c1b3d15cceb48e4874dab091d627f69>.

¹²² Rolland EA at 19 (showing location of school in relation to Rolland well pad).

¹²³ Ohio Environmental Protection Agency, Division of Air Pollution Control, Hydraulic Fracturing Well Preliminary Air Monitoring Assessment, Muskingum County (February 2014).

BLM cannot comply with its obligation to take a hard look at the direct effects of the project's impact to regional air quality by exclusively relying on state air quality permitting requirements that are intended only to ensure compliance with NAAQS pursuant to the Clean Air Act. By equating Clean Air Act compliance with a sufficient NEPA analysis, BLM violates NEPA's requirement to disclose all of the project's impacts on air quality. The NAAQS are intended to establish compliance standards for the Clean Air Act, not to serve as a benchmark for NEPA impact assessments. See *Calvert Cliffs' Coordinating Committee, Inc. v. United States Atomic Energy Com.*, 449 F.2d 1109 at 1123 (D.C. Cir. 1971) (stating that an agency cannot abdicate its responsibilities under NEPA "to other agencies' certifications" because doing so "neglects the mandated balancing analysis."); *Edwardsen v. U.S. Dep't of the Interior*, 268 F.3d 781, 789 (9th Cir. 2001) ("[T]he fact that [an] area will remain with compliance with the NAAQS is not particularly meaningful....A more relevant measure would be the degree to which [the Federal action] contributes to the degradation of air quality."). Just because the current air quality in the Rolland APDs region is meeting all applicable Clean Air Act standards,¹²⁴ this cannot be used to determine the degree that the area's air quality will be degraded if the Rolland wells become operational.

In addition, BLM's reliance on what appear to be completely voluntary measures, which BLM "encourages" and "recommend[s]" operators to implement, does not support a finding of no significant impact.¹²⁵ While BLM notes that other measures would be required by a state air permit, it fails to identify what specific requirements would apply to the wells at issue, thereby undermining NEPA's public disclosure requirement. In fact, the Ohio Environmental Protection Agency, Division of Air Pollution Control (OEPA-DAPC) will not issue a Permit-to-Install and Operate (PTIO) for the Rolland wells until the wells are constructed and operational.¹²⁶ Further, in Ohio, drilling and completion operations are exempt from permitting—only the production operations are subject to permitting requirements.¹²⁷ This PTIO will include requirements such as specific facility emission limits, operating restrictions, monitoring requirements, and compliance reporting requirements.¹²⁸ BLM cannot rely on mitigation and disclosure requirements in a future air permit to fulfill its NEPA obligations now. The purpose of the Rolland EA is for BLM to look at the impacts in total, and to take a hard look at all "reasonably foreseeable" impacts now, before approving the project.

BLM's reliance on the future issuance of state air permits to meet its air quality impacts analysis requirements now avoids a key pillar of NEPA review, which is to assess impacts and assign significance at the earliest stage possible. BLM is required to perform and disclose an "assessment of all 'reasonably foreseeable' impacts at the earliest practicable point, and this must take place before an 'irretrievable commitment of resources' is made." *N.M. ex rel. Richardson v. BLM*, 565 F.3d 683, 716, 718 (10th Cir. 2009). The public has no way of assessing whether those future air permitting requirements are

¹²⁴ Rolland EA at 18.

¹²⁵ See Rolland EA at 24.

¹²⁶ Ohio Administrative Code Rule 3704.03(F), and Ohio Administrative Code Rule 3704.03(G).

¹²⁷ Ohio Environmental Protection Agency, Division of Air Pollution Control, Air General Permit for Shale Gas Well Sites (Feb. 2012), <http://www.epa.ohio.gov/portals/47/nr/2012/february/airgp2-1-12.pdf>.

¹²⁸ Ohio Environmental Protection Agency, Division of Air Pollution Control, General Permit for Oil and Gas Well-site Production Operations.

sufficient to address the project's reasonably foreseeable direct, indirect or cumulative impacts to local air quality. BLM also failed to identify specific environmental impact mitigation methods for controlling air pollution emissions from this project, which violates NEPA's requirement that the agency identify mitigation measures, 40 C.F.R. § 1508.25, and consider all reasonable alternatives. *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1217 (9th Cir. 2008) (citing 40 C.F.R. § 1502.14(a)).

Finally, BLM fails to even review cumulative impacts associated with future oil and gas development in and around the Rolland project, including whether any additional well development will result in exceedances of the NAAQS or worsen adverse health impacts from HAP pollution. Numerous horizontal wells have already been developed in southeast Ohio, including Monroe County, and will likely continue to be developed in this area, but neither the Rolland EA nor Leasing EA mentions this or attempts to quantify emissions from these potential sources.¹²⁹ A number of other industrial projects proposed or approved in the vicinity of the project area could impact air quality, including the Rover Pipeline, Buckeye Xpress Pipeline, Mariner East Pipeline, Shell Ethane Cracker Plant, the PTT Global Ethane Cracker Plant, and Energy Storage Ventures gas storage project.¹³⁰ BLM's arbitrary conclusion with no factual analysis or basis "that the project would produce short-term and negligible emission increments and would therefore contribute minimally to cumulative effects on air quality"¹³¹ demonstrates a complete failure to analyze the cumulative impacts of the project's emissions to air quality under NEPA in the context of increased fracking and other industrial development in southeast Ohio.

A 2011 interagency guidance memorandum of understanding, signed by the Department of Interior, outlines a commitment by the agency to undergo detailed analyses of air quality compliance in oil and gas EAs. The MOU establishes "a clearly defined, efficient approach to compliance with [NEPA] regarding air quality . . . in connection with oil and gas development on Federal lands."¹³² The MOU "provides for early interagency consultation throughout the NEPA process; common procedures for determining what type of air quality analyses are appropriate and when air modeling is necessary; specific provisions for analyzing and discussing impacts to air quality and for mitigating such impacts; and a dispute resolution process to facilitate timely resolution of differences among agencies."¹³³ The

¹²⁹ See Center for Biological Diversity, Horizontal Well Map 2017 (showing locations of producing and permitted wells in and around Wayne National Forest) (Ex. K).

¹³⁰ See Federal Energy Regulatory Commission, Notice Of Intent to Prepare an Environmental Assessment for the Planned Buckeye Xpress Project (Oct. 17, 2017); Exhibit F at 27-30 (Center et al. Protest of Wayne National Forest December 2017 lease sale discussing Rover pipeline, PTT Global cracker plant, Shell cracker plant, and Energy Storage Ventures gas storage projects); Sunoco Logistics, Mariner East Pipeline Map (accessed Nov. 14, 2017); Eclipse October 2017 Presentation at 20 (showing locations of foregoing projects).

¹³¹ Rolland EA at 24.

¹³² U.S. Department of Agriculture, Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the National Environmental Policy Act Process, Preamble (2011).

¹³³ *Id.* at 4.

goal of this process is to ensure that “federal oil and gas decisions do not cause or contribute to exceedances of the National Ambient Air Quality Standards (NAAQS).”¹³⁴ The MOU outlines recommended technical, quantitative procedures to follow, which include identifying the type of oil and gas wells and conducting an emissions inventory of criteria pollutants. Further air quality modeling is required if certain criteria are met, based on the level of emissions impact and the geographic location of the action.¹³⁵ This MOU outline procedures that both the BLM and EPA have agreed are best practices in quantifying criteria pollutants in an oil and gas EA. BLM has the necessary tools at its disposal, and has a clear legal duty to disclose the requisite air quality analysis to show compliance with health protective air quality standards.

a. Types of Air Emissions.

As described above, unconventional and conventional oil and gas operations emit large amounts and a wide array of toxic air pollutants,¹³⁶ also referred to as Hazardous Air Pollutants, which are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects.¹³⁷ BLM, however, has failed to provide any quantification or analysis of the potential effects of hazardous air pollutants from the proposed wells, including localized effects on neighboring residences and Midway Elementary School.

Air pollutants emitted by unconventional oil and gas production include toxic BTEX compounds (benzene, toluene, ethylbenzene, and xylene); volatile organic compounds (VOCs) such as methylene chloride; nitrogen oxides (NOx); particulate matter (including diesel exhaust); alkanes (methane, ethane, propane); formaldehyde; hydrogen sulfide; silica; acid mists; sulfuric oxide; and radon gas.¹³⁸ These toxic air contaminants and smog-forming chemicals (such as VOCs, NOx, methane and ethane) threaten local communities and regional air quality.

The reporting requirements recently implemented by the California South Coast Air Quality Management District (“SCAQMD”) have shown that at least 44 chemicals known to be air toxics have been used in fracking and other types of unconventional oil and gas recovery in California.¹³⁹ Through the implementation of these new reporting requirements, it is now known that operators have been using several types of air toxics, including crystalline silica, methanol, hydrochloric acid, hydrofluoric acid, 2-butoxyethanol, ethyl glycol monobutyl ether, xylene, amorphous silica fume, aluminum oxide,

¹³⁴ *Id.* at 1, 2.

¹³⁵ *Id.* § V.E.1., pg. 9.

¹³⁶ Sierra Club et al. comments on New Source Performance Standards: Oil and Natural Gas Sector; Review and Proposed Rule for Subpart OOOO (Nov. 30, 2011) (“Sierra Club Comments”) at 13.

¹³⁷ See U.S. Environmental Protection Agency, Health and Environmental Effects of Hazardous Air Pollutants, (accessed Jan 5, 2017).

¹³⁸ McKenzie, Lisa M. et al., Human Health Risk Assessment of Air Emissions From Development of Unconventional Natural Gas Resources, 424 Science of the Total Environment 79 (2012) (“McKenzie 2012”); Shonkoff, Seth B.C. et al., Environmental Public Health Dimensions of Shale and Tight Gas Development, 122 Environmental Health Perspectives 787 (2014) (“Shonkoff 2014”).

¹³⁹ Center for Biological Diversity, Air Toxics One Year Report (June 2014) at 1.

acrylic polymer, acetophenone, and ethylbenzene. Many of these chemicals also appear on the U.S. EPA's list of hazardous air pollutants.¹⁴⁰ EPA has also identified six "criteria" air pollutants that must be regulated under the NAAQS due to their potential to cause primary and secondary health effects. As detailed below, concentrations of many of these pollutants—ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead—have been shown to increase in regions where unconventional oil and gas recovery techniques are permitted.

VOCs, from car and truck engines as well as the drilling and completion stages of oil and gas production, make up about 3.5 percent of the gases emitted by oil or gas operations.¹⁴¹ The VOCs emitted include the BTEX compounds – benzene, toluene, ethyl benzene, and xylene – which are listed as Hazardous Air Pollutants.¹⁴² There is substantial evidence showing the grave harm from these pollutants.¹⁴³ Recent studies and reports confirm the pervasive and extensive amount of VOCs emitted by unconventional oil and gas extraction.¹⁴⁴ For example, a study covering sites near oil and gas wells in five different states including Colorado, Wyoming, Ohio, Pennsylvania, and Arkansas, found that concentrations of eight toxic volatile chemicals, including benzene, formaldehyde and hydrogen sulfide, exceeded federal health and safety standards, at times by several orders of magnitude.¹⁴⁵ Another study determined that vehicle traffic and engine exhaust were likely the sources of intermittently high dust and benzene concentrations observed near well pads.¹⁴⁶ Recent studies have found that oil and gas operations are likely responsible for elevated levels of hydrocarbons such as benzene downwind of the Denver-Julesburg Fossil Fuel Basin, north of Denver.¹⁴⁷ Another study found that oil and gas operations in this area emit approximately 55 percent of the VOCs in northeastern Colorado.¹⁴⁸

VOCs, NOx, methane, and ethane are potent ground-level (tropospheric) ozone precursors that are emitted by oil and gas drilling and fracking operations. Ozone can result in serious health conditions, including heart and lung disease and mortality.¹⁴⁹ Exposure to elevated levels of ozone is estimated to

¹⁴⁰ U.S. Environmental Protection Agency, The Clean Air Act Amendments of 1990 List of Hazardous Air Pollutants, Technology Transfer Network Air Toxics Web Site (accessed July 29, 2015).

¹⁴¹ Brown, Heather, Memorandum to Bruce Moore, U.S.EPA/OAQPS/SPPD re Composition of Natural Gas for use in the Oil and Natural Gas Sector Rulemaking, July 28, 2011 ("Brown Memo") at 3.

¹⁴² 42 U.S.C. § 7412(b).

¹⁴³ Colborn, T. et al., Natural Gas Operations from a Public Health Perspective, 17 Human And Ecological Risk Assessment 5 (2011) ("Colborn 2011"); McKenzie 2012.

¹⁴⁴ McCawley, Michael., Air, Noise, and Light Monitoring Plan for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations (ETD-10 Project), West Virginia University School of Public Health, Morgantown, WV (2013) ("McCawley 2013"); Center for Biological Diversity, Dirty Dozen: The 12 Most Commonly Used Air Toxics in Unconventional Oil Development in the Los Angeles Basin (Sept. 2013).

¹⁴⁵ Macey, Gregg P. et al., Air Concentrations of Volatile Compounds Near Oil and Gas Production: A Community-Based Exploratory Study, 13 Environmental Health 82 (2014) at 1.

¹⁴⁶ McCawley 2013.

¹⁴⁷ Pétron, G. et al., Hydrocarbon Emissions Characterization in the Colorado Front Range – A Pilot Study, 117 Journal of Geophysical Research D04304 (2012) at 8, 13 ("Pétron 2012").

¹⁴⁸ Gilman, Jessica B. et al., Source Signature of Volatile Organic Compounds from Oil and Natural Gas Operations in Northeastern Colorado, 47 Environmental Science & Technology 1297 (2013) at 1297, 1303 ("Gilman 2013").

¹⁴⁹ U.S. Environmental Protection Agency, Integrated Science Assessment (ISA) for Ozone (O3) and Related Photochemical Oxidants (2013).

be the cause of ~10,000 premature deaths per year in the United States.¹⁵⁰ VOCs can form ground-level (tropospheric) ozone when combined with nitrogen oxides (“NO_x”) from compressor engines, turbines, other engines used in drilling, and flaring,¹⁵¹ in the presence of sunlight. This reaction can diminish visibility and air quality and harm vegetation. Many regions around the country with substantial oil and gas operations are now suffering from extreme ozone levels due to heavy emissions of these pollutants.¹⁵² A recent study of ozone pollution in the Uintah Basin of northeastern Utah, a rural area that experiences hazardous tropospheric ozone concentrations, found that oil and gas operations were responsible for 98 to 99 percent of VOCs and 57 to 61 percent of NO_x emitted from sources within the Basin considered in the study’s inventory.¹⁵³

Ground-level ozone can also be caused by methane, which is leaked and vented at various stages of unconventional oil and gas development, as it interacts with nitrogen oxides and sunlight.¹⁵⁴ In addition to its role as a potent greenhouse gas, methane’s effect on ozone concentrations can be substantial. One paper modeled reductions in various anthropogenic ozone precursor emissions and found that “[r]educing anthropogenic CH₄ emissions by 50% nearly halves the incidence of U.S. high-O₃ events”¹⁵⁵

Ethane is also a potent precursor of ground-based ozone pollution as it breaks down and reacts with sunlight to create smog, as well as being a greenhouse gas. Ethane emissions have risen steeply in recent years due to U.S. oil and gas production. A recent study documented that ethane emissions in the Northern Hemisphere increased by about 400,000 tons annually between 2009 and 2014, with the majority coming from North American oil and gas activity, reversing a decades-long decline in ethane emissions.¹⁵⁶ Shockingly, about 60 percent of the drop in ethane levels that occurred over the past 40 years has already been made up in the past five years. At this rate, U.S. ethane levels are expected to hit 1970s levels in about three years. About two percent of global ethane emissions originate from the

¹⁵⁰ Caiazzo, Fabio et al., *Air Pollution and Early Deaths in the United States. Part I: Quantifying the Impact of Major Sectors in 2005*, 79 *Atmospheric Environment* 198 (2013).

¹⁵¹ See, e.g., U.S. Environmental Protection Agency, *Oil and Gas Sector: Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution: Background Technical Support Document for Proposed Standards at 3-6* (July 2011); Armendariz, Al, *Emissions for Natural Gas Production in the Barnett Shale Area and Opportunities for Cost-Effective Improvements* (2009) (“Armendariz 2009”) at 24.

¹⁵² Armendariz 2009 at 1, 3, 25-26; Koch, Wendy, *Wyoming's Smog Exceeds Los Angeles' Due to Gas Drilling*, USA Today, May 9, 2011; Craft, Elena, *Environmental Defense Fund, Do Shale Gas Activities Play a Role in Rising Ozone Levels?* (2012); Colorado Dept. of Public Health and Environment, *Conservation Commission, Colorado Weekly and Monthly Oil and Gas Statistics* (July 6, 2012) at 12.

¹⁵³ Lyman, Seth & Howard Shorthill, *Final Report: 2012 Uintah Basin Winter Ozone & Air Quality Study*, Utah Department of Environmental Quality (2013) (“Lyman 2013”); see also Gilman 2013.

¹⁵⁴ Fiore, Arlene et al., *Linking Ozone Pollution and Climate Change: The Case for Controlling Methane*, 29 *Geophys. Res. Letters* 19 (2002) (“Fiore 2002”); U.S. Environmental Protection Agency, *Oil and Gas Sector: New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants Reviews Proposed Rule*, 76 *Fed. Reg.* 52,738 (Aug. 23, 2011).

¹⁵⁵ Fiore 2002; see also Martin, Randal et al., *Final Report: Uinta Basin Winter Ozone and Air Quality Study Dec 2010 - March 2011* (2011) at 7.

¹⁵⁶ Helmig, Detlev et al., *Reversal of Global Atmospheric Ethane and Propane Trends Largely Due to US Oil and Natural Gas Production*, 9 *Nature Geoscience* 490 (2016).

Bakken Shale oil and gas field alone, which emits 250,000 tons of ethane per year.¹⁵⁷ Because global ethane levels were decreasing until 2009, the U.S. shale gas boom is thought to be responsible for the global increase in levels since 2010.

Oil and gas operations can also emit hydrogen sulfide. The hydrogen sulfide is contained in the natural gas and makes that gas “sour.”¹⁵⁸ Hydrogen sulfide may be emitted during all stages of operation, including exploration, extraction, treatment and storage, transportation, and refining. Long-term exposure to hydrogen sulfide is linked to respiratory infections, eye, nose, and throat irritation, breathlessness, nausea, dizziness, confusion, and headaches.¹⁵⁹

The oil and gas industry is also a major source of particulate matter. The heavy equipment regularly used in the industry burns diesel fuel, generating fine particulate matter¹⁶⁰ that is especially harmful.¹⁶¹ Vehicles traveling on unpaved roads also kick up fugitive dust, which is particulate matter.¹⁶² Further, both NO_x and VOCs, which as discussed above are heavily emitted by the oil and gas industry, are also particulate matter precursors.¹⁶³ Some of the health effects associated with particulate matter exposure are “premature mortality, increased hospital admissions and development of chronic respiratory disease.”¹⁶⁴

Fracking results in additional air pollution that can create a severe threat to human health. One analysis found that 37 percent of the chemicals found at fracked gas wells were volatile, and that of those volatile chemicals, 81 percent can harm the brain and nervous system, 71 percent can harm the cardiovascular system and blood, and 66 percent can harm the kidneys.¹⁶⁵ The SCAQMD has identified three areas of dangerous and unregulated air emissions from fracking: (1) the mixing of the fracking chemicals; (2) the use of the silica, or sand, as a proppant, which causes the deadly disease silicosis; and (3) the storage of fracking fluid once it comes back to the surface.¹⁶⁶ Preparation of the fluids used for well completion often involves onsite mixing of gravel or proppants with fluid, a process which

¹⁵⁷ Kort, Eric A. et al., Fugitive Emissions From the Bakken Shale Illustrate Role of Shale Production in Global Ethane Shift 43 Geophysical Research Letters 4617 (2016).

¹⁵⁸ Sierra Club Comments.

¹⁵⁹ U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Report to Congress on Hydrogen Sulfide Air Emissions Associated with the Extraction of Oil and Natural Gas (EPA-453/R-93-045) at I (Oct. 1993) (“USEPA 1993”).

¹⁶⁰ Earthworks, Sources of Oil and Gas Pollution (2011).

¹⁶¹ Bay Area Air Quality Management District, Particulate Matter Overview, Particulate Matter and Human Health (2012).

¹⁶² U.S. Environmental Protection Agency, Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter (June 2012) (“EPA RIA”).

¹⁶³ EPA RIA at 2-2.

¹⁶⁴ U.S. Environmental Protection Agency, National Ambient Air Quality Standards for Particulate Matter Proposed Rule, 77 Fed. Reg. 38,890, 38,893 (June 29, 2012).

¹⁶⁵ Colborn 2011 at 8.

¹⁶⁶ South Coast Air Quality Management District, Draft Staff Report on Proposed Rule 1148.2 - Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers (January 2013) at 15 (“SCAQMD Draft Staff Report PR1148-2”).

potentially results in major amounts of particulate matter emissions.¹⁶⁷ Further, these proppants often include silica sand, which increases the risk of lung disease and silicosis when inhaled.¹⁶⁸ Finally, as flowback returns to the surface and is deposited in pits or tanks that are open to the atmosphere, there is the potential for organic compounds and toxic air pollutants to be emitted, which are harmful to human health as described above.¹⁶⁹

The EA should study the potential for oil and gas operations sites in the project area to emit such air toxics and any other pollutants that may pose a risk to human health, paying particular attention to the impacts of air pollution on environmental justice communities that already bear the burden of disproportionately high levels of air pollution. The EA lacks any discussion of socioeconomically disadvantaged communities in the vicinity of the project area.

The EA should rely on the most up-to-date information regarding the contribution of oil and gas operations to air pollution levels. Numerous studies demonstrate that state and federal emissions inventories significantly underestimate the levels of hazardous air pollution coming from oil and gas drilling and fracking operations. For example, aerial surveys of more than 8,000 oil and gas wells in seven US regions found that well pads emit considerably more methane and VOCs than captured by existing inventories.¹⁷⁰ Recent studies in Weld County, Colorado, show that existing emissions inventories likely underestimate the contribution of oil and gas operations to VOC levels by at least a factor of two, and that benzene emissions are underestimated by four to nine times.¹⁷¹ These studies suggest that the health risk assessments conducted using these inventories are inaccurate and underestimate exposures and health risks.¹⁷² Similarly, the assessment of fracking in California by the California Council on Science and Technology found that current inventory methods underestimate methane and VOC emissions from oil and gas operations.¹⁷³

b. Sources of Air Emissions.

Harmful air pollutants are emitted during every stage of unconventional oil and gas development, including drilling, completion, well stimulation, production, and disposal, as well as from transportation of water, sand, chemicals, and to and from the well pad.¹⁷⁴ The well stimulation stage can

¹⁶⁷ *Id.*

¹⁶⁸ South Coast Air Quality Management District, Response to Questions re Air Quality Risks of Hydraulic Fracturing in California, Submission to Joint Senate Hearing (2013) at 3.

¹⁶⁹ SCAQMD Draft Staff Report PR1148-2 at 15.

¹⁷⁰ Lyon, David R. et al., Aerial Surveys of Elevated Hydrocarbon Emissions From Oil and Gas Production Sites, 50 Environmental Science & Technology 4877 (2016).

¹⁷¹ Pétron 2012 at 1, 18 (noting state and federal inventories likely underestimate hydrocarbon emissions from oil and gas operations by as much as factor of two); Pétron, Gabrielle et al., A New Look at Methane and Non-Methane Hydrocarbon Emissions from Oil and Natural Gas Operations in the Colorado Denver-Julesburg Basin, 119 Journal of Geophysical Research: Atmospheres 6836 (2014) at 6836 (“Pétron 2014”).

¹⁷² Pétron 2014.

¹⁷³ Brandt, Adam et al., Ch 3: Air quality impacts from well stimulation, An Independent Assessment of Well Stimulation in California, 2 California Council on Science and Technology (2015) (“CCST 2015”).

¹⁷⁴ Shonkoff 2014.

emit diesel exhaust, VOCs, particulate matter, ozone precursors, silica, and acid mists.¹⁷⁵ Drilling and casing the wellbore require substantial power from large equipment. The engines used typically run on diesel fuel, which emit particularly harmful types of air pollutants when burned. Similarly, high-powered pump engines are used in the fracturing and completion phase. This too can amount in large volumes of air pollution. Flaring, venting, and fugitive emissions of gas are also a potential source of air emissions. Gas flaring and venting can occur in both oil and gas recovery processes when underground gas rises to the surface and is not captured as part of production. Emissions from flaring typically include carbon monoxide, nitrogen oxides, benzene, formaldehyde and xylene, but levels of these smog-forming compounds are seldom measured directly.¹⁷⁶

Fugitive emissions can occur at every stage of extraction and production, often leading to high volumes of gas being released into the air. Methane emissions from oil and gas production are as much as 270 percent greater than previously estimated by calculation.¹⁷⁷ Recent studies show that emissions from pneumatic valves (which control routine operations at the well pad by venting methane during normal operation) and fugitive emissions are higher than EPA estimates.¹⁷⁸

Evaporation from pits can also contribute to air pollution. Pits that store drilling waste, produced water, and other waste fluid may be exposed to the open air. Chemicals mixed with the wastewater—including the additives used to make fracking fluids, as well as volatile hydrocarbons, such as benzene and toluene, brought to the surface with the waste—can escape into the air through evaporation. Some pits are equipped with pumps that spray effluents into the air to hasten the evaporation process. For example, evaporation from fracking waste pits in western Colorado was found to have added tons of toxic chemicals to the air, increasing air pollution in Utah.¹⁷⁹ In Texas, toxic air emissions from fracking waste pits are unmonitored and unregulated.¹⁸⁰ In California, unlined disposal pits for drilling and fracking waste are documented sources of contamination.¹⁸¹ Even where waste fluid is stored in so-called “closed loop” storage tanks, fugitive emissions can escape from tanks.

¹⁷⁵ *Id.*

¹⁷⁶ Physicians for Social Responsibility and Concerned Health Professionals of NY, Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking, Fourth Edition, November 17, 2016 (“PSR 2016”).

¹⁷⁷ Miller, Scot et al., Anthropogenic emissions of methane in the United States, 110 PNAS 50 (2013).

¹⁷⁸ Allen, David et al., Measurements of Methane Emissions at Natural Gas Production Sites in The United States, 110 PNAS 17768 (2013) (“Allen 2013”); Harriss, Robert et al., Using Multi-Scale Measurements to Improve Methane Emission Estimates from Oil and Gas Operations in the Barnett Shale Region, Texas, 49 Environ. Sci. Technol. 7524 (2015).

¹⁷⁹ Maffy, Brian, Utah grapples with toxic water from oil and gas industry, The Salt Lake Tribune, August 28, 2014; The company responsible for the waste pits was found to have operated without a permit, underreported emissions and provided erroneous data to regulators.

¹⁸⁰ Hasemyer, David and Zahra Hirji, Open Pits Offer Cheap Disposal for Fracking Sludge But Health Worries Mount, Center for Public Integrity October 2, 2014.

¹⁸¹ Stringfellow, William T. et al., Ch 2: Impacts of Well Stimulation on Water Resources, An Independent Assessment of Well Stimulation in California, 2 California Council on Science and Technology (2015) (“CCST 2015”) at 110-113.

As mentioned above, increased truck traffic will lead to more air emissions. Trucks capable of transporting large volumes of chemicals and waste fluid typically use large engines that run on diesel fuel. Air pollutants from truck engines will be emitted not only at the well site, but also along truck routes to and from the site. Based on a recent Ohio fracking wastewater analysis coupled with the EA's cited amount of wastewater trucked offsite for the Rolland project, we estimate that this project will require between 557 to 1,175 tanker trucks to simply address wastewater transportation from the site.¹⁸² The EA fails to acknowledge or analyze the air quality impacts from these trucks and that impact to public health and safety.

The EA must provide a more complete and thorough analysis and disclosure of the effects the Rolland project could have on air quality, including the impacts that would result from fracking. The EA must disclose air pollution mitigation measures.

c. Impact of Increased Air Pollution.

The potential harms resulting from increased exposure to the dangerous air pollutants from unconventional oil and gas development are serious and wide-ranging. A growing body of scientific research has documented adverse public health impacts from unconventional oil and gas development, including studies showing air pollutants at levels associated with reproductive and developmental harms and the increased risk of morbidity and mortality.¹⁸³ A comprehensive review of the risks and harms of fracking to public health came to several key findings related to air pollution: (1) "drilling and fracking emissions contribute to toxic air pollution and smog (ground-level ozone) at levels known to have health impacts," (2) "public health problems associated with drilling and fracking, including reproductive impacts and occupational health and safety problems, are increasingly well documented"; and (3) "fracking infrastructure poses serious potential exposure risks to those living near it."¹⁸⁴

Air toxics and hazardous air pollutants, by definition, can result in harm to human health and safety. Understanding the full extent of the health effects of exposure is still far from being complete, but already there are numerous studies that have found these chemicals to have serious health

¹⁸² Auch 2017 at 8.

- Total waste water expected: $((180.4 \text{ AF (Rolland EA at 37)}) * (0.11) * (325,851 \text{ gal/AF})) = 6,466,187 \text{ gal.}$
- Trucks required – high estimate: $(6,466,187 \text{ gal}) / (5,500 \text{ gal (low estimate for truck volume in EA at 35)}) = 1,175 \text{ trucks OR}$
- Trucks required – low estimate: $(6,466,187 \text{ gal}) / (11,600 \text{ gal (high estimate for truck volume in EA at 35)}) = 557 \text{ trucks}$

¹⁸³ Hays, Jake & Seth B.C. Shonkoff, Towards an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 11 PLoS ONE e0154164 (2016); Shonkoff 2014; Webb, Ellen et al., Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations, 29 Rev Environ Health 4 (2014); McKenzie 2012; Clean Air Task Force, Fossil Fumes: A Public Health Analysis of Toxic Air Pollution From the Oil and Gas Industry, June 2016.

¹⁸⁴ PSR 2016 at 13-16.

consequences for humans exposed to even minimal amounts. The negative effects of criteria pollutants are well documented and are summarized by the U.S. EPA's website:

Nitrogen oxides (NO_x) react with ammonia, moisture, and other compounds to form small particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death. NO_x and volatile organic compounds react in the presence of heat and sunlight to form ozone.

Particulate matter (PM) - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including: premature death in people with heart or lung disease, increased mortality, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.¹⁸⁵

Sulfur Dioxide (SO₂) – has been shown to cause an array of adverse respiratory effects including bronchoconstriction and increased asthma symptoms.¹⁸⁶ Studies also show a connection between short-term exposure and increased visits to emergency departments and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and asthmatics.¹⁸⁷

Carbon Monoxide (CO) can cause harmful health effects by reducing oxygen delivery to the body's organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death.¹⁸⁸ Exposure to CO can reduce the oxygen-carrying capacity of the blood. People with several types of heart disease already have a reduced capacity for pumping oxygenated blood to the heart, which can cause them to experience myocardial ischemia (reduced oxygen to the heart), often accompanied by chest pain (angina), when exercising or under increased stress.¹⁸⁹ For these people, short-term CO exposure further affects their body's already compromised ability to respond to the increased oxygen demands of exercise or exertion.¹⁹⁰

Ozone (O₃) can trigger or worsen asthma and other respiratory ailments.¹⁹¹ Ground level ozone can have harmful effects on sensitive vegetation and ecosystems. Ozone may also lead to loss of species diversity and changes to habitat quality, water cycles, and nutrient cycles.

¹⁸⁵ U.S. Environmental Protection Agency, Particulate Matter (accessed July 30, 2015); Ostro, Bart et al., Long-term Exposure to Constituents of Fine Particulate Air Pollution and Mortality: Results from the California Teachers Study, 118 Environmental Health Perspectives 3 (2010).

¹⁸⁶ U.S. Environmental Protection Agency, Sulfur Dioxide (accessed July 29, 2015).

¹⁸⁷ *Id.*

¹⁸⁸ U.S. Environmental Protection Agency, Carbon Monoxide (accessed July 29, 2015).

¹⁸⁹ *Id.*

¹⁹⁰ *Id.*

¹⁹¹ U.S. Environmental Protection Agency, Ground Level Ozone (accessed July 29, 2015).

The range of illnesses that can result from the wide array of air pollutants from fracking were summarized in a study by Dr. Theo Colborn, which charts which chemicals have been shown to be linked to certain illnesses.¹⁹² This study analyzed air samples taken during drilling operations near natural gas wells and residential areas in Garfield County, and detected 57 chemicals between July 2010 and October 2011, including 44 with reported health effects.¹⁹³ For example:

Thirty-five chemicals were found to affect the brain/nervous system, 33 the liver/metabolism, and 30 the endocrine system, which includes reproductive and developmental effects. The categories with the next highest numbers of effects were the immune system (28), cardiovascular/blood (27), and the sensory and respiratory systems (25 each). Eight chemicals had health effects in all 12 categories. There were also several chemicals for which no health effect data could be found.¹⁹⁴

The study found extremely high levels of methylene chloride, which may be used as cleaning solvents to remove waxy paraffin that is commonly deposited by raw natural gas in the region. These deposits solidify at ambient temperatures and build up on equipment.¹⁹⁵ While none of the detected chemicals exceeded governmental safety thresholds of exposure, the study noted that such thresholds are typically based on “exposure of a grown man encountering relatively high concentrations of a chemical over a brief time period, for example, during occupational exposure.”¹⁹⁶ Consequently, such thresholds may not apply to individuals experiencing “chronic, sporadic, low-level exposure,” including sensitive populations such as children, the elderly and pregnant women.¹⁹⁷ For example, the study detected polycyclic aromatic hydrocarbon (PAH) levels that could be of “clinical significance,” as recent studies have linked low levels of exposure to lower mental development in children who were prenatally exposed.¹⁹⁸ In addition, government safety standards do not take into account “the kinds of effects found from low-level exposure to endocrine disrupting chemicals . . . , which can be particularly harmful during prenatal development and childhood.”¹⁹⁹

Adverse health impacts documented among residents living near drilling and fracking operations include reproductive harms, increased asthma attacks, increased rates of hospitalization, ambulance runs, emergency room visits, self-reported respiratory problems and rashes, motor vehicle fatalities, trauma, and drug abuse. A recent review concluded:

By several measures, evidence for fracking-related health problems is emerging across the United States. In Pennsylvania, as the number of gas wells increase in a community, so do rates

¹⁹² Colborn 2011; Colborn, Theo, et al., An Exploratory Study of Air Quality near Natural Gas Operations, The Endocrine Disruption Exchange (2012)(“Colborn 2012”).

¹⁹³ Colborn 2012 at pp. 21-22 (pages refer to page numbers in attached manuscript and not journal pages).

¹⁹⁴ Colborn 2012 at 11.

¹⁹⁵ *Id.* at 10.

¹⁹⁶ *Id.* at 11-12.

¹⁹⁷ *Id.* at 12.

¹⁹⁸ *Id.* at 10-11.

¹⁹⁹ *Id.* at 12.

of hospitalization. Drilling and fracking operations are correlated with elevated motor vehicle fatalities (Texas), asthma (Pennsylvania), self-reported skin and respiratory problems (southwestern Pennsylvania), ambulance runs and emergency room visits (North Dakota), infant deaths (Utah), birth defects (Colorado), high risk pregnancies (Pennsylvania), premature birth (Pennsylvania), and low birthweight (multiple states). Benzene levels in ambient air surrounding drilling and fracking operations are sufficient to elevate risks for future cancers in both workers and nearby residents, according to studies. Animal studies show that two dozen chemicals commonly used in fracking operations are endocrine disruptors that can variously disrupt organ systems, lower sperm counts, and cause reproductive harm at levels to which people can be realistically exposed.²⁰⁰

A rigorous study by Johns Hopkins University, which examined 35,000 medical records of people with asthma in Pennsylvania, found that people who live near a higher number of, or larger, active gas wells were 1.5 to 4 times more likely to suffer from asthma attacks than those living farther away, with the closest groups having the highest risk.²⁰¹ Increased asthma risks occurred during all phases of well development. A recent Yale University study identified numerous fracking chemicals that are known, probable, or possible human carcinogens (20 air pollutants) and/or are linked to increased risk for leukemia and lymphoma (11 air pollutants), including benzene, 1,3-butadiene, cadmium, diesel exhaust, and polycyclic aromatic hydrocarbons.²⁰²

Numerous studies suggest that higher maternal exposure to fracking and drilling can increase the incidence of high-risk pregnancies, premature births, low-birthweight babies and birth defects. A study of 9,384 pregnant women in Pennsylvania found that women who live near active drilling and fracking sites had a 40 percent increased risk for having premature birth and a 30 percent increased risk for having high-risk pregnancies.²⁰³ Another study found that pregnant women who had greater exposure to gas wells (measured in terms of proximity and density of wells) had a much higher risk of having low-birthweight babies; the researchers identified air pollution as the likely route of exposure.²⁰⁴ In rural Colorado, mothers with greater exposure to natural gas wells were associated with a higher risk of having babies with congenital heart defects and possibly neural tube defects.²⁰⁵

²⁰⁰ PSR 2016 at 93.

²⁰¹ Rasmussen, Sara G. et al., Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations, 176 JAMA Internal Medicine 1334 (2016).

²⁰² Elliot, Elise G. et al., A Systematic Evaluation of Chemicals in Hydraulic-Fracturing Fluids and Wastewater for Reproductive and Developmental Toxicity, 27 Journal of Exposure Science and Environmental Epidemiology 90 (2016).

²⁰³ Casey, Joan A., Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA, 27 Epidemiology 163 (2016).

²⁰⁴ Stacy, Shaina L. et al., Perinatal Outcomes and Unconventional Natural Gas Operations in Southwest Pennsylvania. 10 PLoS ONE e0126425 (2015).

²⁰⁵ McKenzie, Lisa M., Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado, 122 Environmental Health Perspectives 412 (2014).

Other studies have found that residents living closer to drilling and fracking operations had higher hospitalization rates²⁰⁶ and reported more health symptoms, including upper respiratory problems and rashes.²⁰⁷ See also Exhibit F at 20-22 (detailing numerous other studies regarding public health impacts of fracking and unconventional oil and gas development).

Workers suffer high risks from toxic exposure and accidents.²⁰⁸ As summarized by a recent review:

Drilling and fracking jobs are among the most dangerous jobs in the nation with a fatality rate that is five times the national average and shows no sign of abating. Occupational hazards include head injuries, traffic accidents, blunt trauma, burns, inhalation of hydrocarbon vapors, toxic chemical exposures, heat exhaustion, dehydration, and sleep deprivation. An investigation of occupational exposures found high levels of benzene in the urine of wellpad workers, especially those in close proximity to flowback fluid coming up from wells following fracturing activities. Exposure to silica dust, which is definitively linked to silicosis and lung cancer, was singled out by the National Institute for Occupational Safety and Health as a particular threat to workers in fracking operations where silica sand is used. At the same time, research shows that many gas field workers, despite these serious occupational hazards, are uninsured or underinsured and lack access to basic medical care.²⁰⁹

Methods of collecting and analyzing emissions data often underestimate health risks by failing to adequately measure the intensity, frequency, and duration of community exposure to toxic chemicals from fracking and drilling; failing to examine the effects of chemical mixtures; and failing to consider vulnerable populations.²¹⁰ Of high concern, numerous studies highlight that health assessments drilling and fracking emissions often fail to consider impact on vulnerable populations including environmental justice communities²¹¹ and children.²¹² For example, a recent analysis of oil and gas development in

²⁰⁶ Jemielita, Thomas et al., Unconventional Gas and Oil Drilling Is Associated with Increased Hospital Utilization Rates. 10 PLoS ONE e0131093 (2015).

²⁰⁷ Rabinowitz, Peter M. et al., Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania, 123 Environmental Health Perspectives 21 (2015).

²⁰⁸ Esswein, Eric J. et al., Occupational Exposures to Respirable Crystalline Silica During Hydraulic Fracturing, 10 Journal of Occupational and Environmental Hygiene 347 (2013); Esswein, Eric et al., Evaluation of Some Potential Chemical Exposure Risks during Flowback Operations in Unconventional Oil and Gas Extraction: Preliminary Results, 11 Journal of Occupational and Environmental Hygiene D174 (2014); Harrison, Robert J. et al., Sudden Deaths Among Oil and Gas Extraction Workers Resulting from Oxygen Deficiency and Inhalation of Hydrocarbon Gases and Vapors — United States, January 2010–March 2015. 65 MMWR Morb Mortal Wkly Rep 6 (2016); PSR 2016.

²⁰⁹ PSR 2016 at 80

²¹⁰ Brown, David et al., Understanding Exposure From Natural Gas Drilling Puts Current Air Standards to the Test, 29 Reviews on Environmental Health 277 (2014).

²¹¹ Natural Resources Defense Council, Drilling in California: Who's At Risk?, October 2014 ("NRDC 2014"); Clough, Emily & Derek Bell, Just Fracking: A Distributive Environmental Justice Analysis of Unconventional Gas Development in Pennsylvania, USA, 11 Environmental Research Letters 025001 (2016); McKenzie, Lisa M. et al., Population Size, Growth, and Environmental Justice Near Oil and Gas Wells in Colorado, 50 Environmental Science & Technology 11471 (2016).

California found that 14 percent of the state's population (5.4 million people) live within a mile of at least one oil and gas well. More than a third of these people (1.8 million) also live in areas most burdened by environmental pollution.²¹³

The Rolland EA as currently written is woefully inadequate and violates BLM's disclosure and analysis requirements under NEPA. BLM must revise the EA significantly to estimate both criteria pollutants and HAPs, provide a site-specific analysis of HAPs' effects on neighboring residences, towns and schools, model region-wide cumulative effects of these air pollutants, and prepare a detailed literature review of health impacts of these dangerous pollutants. Without assessing the effects of each pollutant, the EA cannot accurately project the true environmental and public health impact of the Rolland project on the local community.

2. The EA Failed to Analyze The Significance and Severity of Greenhouse Gas Emissions

The EA estimates that development of the Rolland project will cause, directly and indirectly, greenhouse gas emissions amounting to more than four hundred thousand metric tons of carbon dioxide equivalent.²¹⁴ However, rather than using project-specific data to estimate potential greenhouse gas emissions, the EA uses generic and outdated estimates from a 2011 study ("Jiang 2011")²¹⁵ that does not accurately portray the potential GHG emissions from the specific processes and techniques used in the particular project at issue here. For example, here, Eclipse plans on drilling laterals of at least 2.8 miles in length from the well pad to the end of the production zone, or nearly 15,000 feet. This length is over three times the lateral length assumed in Jiang 2011, which assumed laterals of only 4,000 feet in length,²¹⁶ and does not include the part of the borehole that initially extends from the well pad before it turns at an angle in a northwest direction for the majority of its length. Eclipse Resources dubs wells with laterals greater than 15,000 feet "super laterals," a technique Eclipse pioneered to improve efficiencies in production.²¹⁷ Longer boreholes require increased drilling and higher-powered equipment, resulting in greater GHG and other air pollutant emissions at the wellhead.

In addition, Jiang 2011 analyzed lifecycle emissions of a typical Marcellus shale well, but the Utica shale formation is typically deeper than the Marcellus by several thousand feet.²¹⁸ The "base case" assumed in Jiang 2011 was a vertical drilling depth of 8,500 feet compared to drilling depths of "roughly 9,000 feet" in the Utica shale for the wells at issue here.²¹⁹ Again, drilling longer and deeper

²¹² Webb, Ellen et al., Potential Hazards of Air Pollutant Emissions From Unconventional Oil and Natural Gas Operations on The Respiratory Health of Children And Infants, 31 Reviews on Environmental Health 225 (2016).

²¹³ NRDC 2014.

²¹⁴ Rolland EA at 24.

²¹⁵ Jiang, Mohan et al., Life cycle greenhouse gas emissions of Marcellus shale gas, 6 Environmental Research Letter 034014, doi:10.1088/1748-9326/6/3/034014. (2011) at pp. 9, ("Jiang 2011").

²¹⁶ Jiang 2011 at 4.

²¹⁷ Eclipse Resources, Investor Presentation (Nov. 2017) at 8, 10.

²¹⁸ Geology.com, Utica Shale - The Natural Gas Giant Below the Marcellus (last accessed Nov. 14, 2017).

²¹⁹ Compare Jiang 2011 at 4 with Rolland EA at 11.

will certainly require increased drilling and higher-powered equipment, resulting in greater emissions than a well with shorter laterals in a shallower formation. In addition, Eclipse has touted using more intensive fracking techniques, which use greater volumes of sand and fluid at higher concentrations to optimize production.²²⁰ With increased material being pumped deep into the ground at higher concentrations to fracture rock and release gas underground, fracking these wells would require greater energy consumption, resulting in higher GHG emissions.

Longer laterals and more intensive fracking would also mean increased production over a longer time period and increased potential for methane leaks, flaring, and waste generation (e.g., produced water, drill cuttings, and flowback), requiring more truck trips for transportation of waste to disposal sites. Again, however, BLM has failed to use any project-specific data regarding estimated number of truck trips and distance to disposal sites to calculate GHG emissions, even though this information can be reasonably projected from information in the APD.

In addition, NEPA requires BLM to inform the public of direct and indirect effects and the “significance” of these emissions, 40 C.F.R. § 1502.16(a)-(b); for example, BLM must “evaluate the[ir] severity.” *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 352 (1989). To serve NEPA’s “twin aims” of informing agency decision-makers and the public, this evaluation must be in terms that will meaningfully inform these intended audiences of the magnitude and consequences of these effects. *Natural Res. Def. Council v. Nuclear Regulatory Comm’n*, 685 F.2d 459, 487 n.149 (D.C. Cir. 1982) *rev’d on other grounds sub nom. Balt. Gas & Elec. Co. v. Natural Res. Def. Council*, 462 U.S. 87, 106-107 (1983); *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981).

Here, the Rolland EA provides no analysis of the impact or severity of greenhouse gas emissions. One widely used approach to evaluating the impact of GHG emissions is to estimate the costs of those emissions to society. The federal Interagency Working Group on the Social Cost of Carbon has developed estimates of the present value of the future costs of carbon dioxide, methane, and nitrous oxide emissions as a proxy for the magnitude and severity of those impacts.²²¹ These tools are easy to use by agencies, easy to understand by the public, and supported by years of peer-reviewed scientific and economic research. The EPA and other federal agencies have used these social cost protocols to estimate the effects of rulemakings on climate, and certain BLM field offices have used these tools in project-level NEPA analysis. These protocols estimate the global financial cost of each additional ton of GHG pollution emitted to the atmosphere, taking into account factors such as diminished agricultural

²²⁰ Eclipse Resources, Investor Presentation (Nov. 2017) at 7, 13.

²²¹ See Interagency Working Group on the Social Cost of Carbon, United States Government, Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866 (May 2013) at 2 (hereinafter 2013 TSD); Interagency Working Group, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016) (last visited October 30, 2016).

productivity, droughts, wildfires, increased intensity and duration of storms, ocean acidification, and sea-level rise.²²²

While NEPA does not require agencies to monetize adverse impacts in all cases, see 40 C.F.R. § 1502.23, it does require an agency to take a hard look at the “ecological ..., aesthetic, historic, cultural, economic, social, [and] health,” effects of its actions, “whether direct, indirect, or cumulative.” 40 C.F.R. § 1508.8. Monetization of costs may be required where available “alternative mode[s] of [NEPA] evaluation [are] insufficiently detailed to aid the decision-makers in deciding whether to proceed, or to provide the information the public needs to evaluate the project effectively.” *Columbia Basin Land Prot. Ass’n v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981). In a recent case concerning an energy infrastructure project, where the agency’s NEPA analysis quantified greenhouse gas emissions but claimed that it was impossible to discuss the effects thereof, the court ruled that the agency’s refusal to use the social cost of carbon to illustrate the impact of these emissions was arbitrary and capricious. *High Country Conservation Advocates v. United States Forest Serv.*, 52 F. Supp. 3d 1174, 1190-91 (D. Colo. 2014).

The Interagency Working Group’s (IWG) tools remain “generally accepted in the scientific community,” 40 C.F.R. § 1502.22(b)(4), notwithstanding Executive Order 13,783, which disbanded the IWG and formally withdrew its technical support documents.²²³ Indeed, that Executive Order did not find fault with any component of the IWG’s analysis. The IWG’s work continues to represent the best estimates presently available.²²⁴ Thus, the IWG’s 2016 update to the estimates of the social costs of greenhouse gases remains the best available and generally accepted tool for assessing the impact of greenhouse gas emissions, notwithstanding the fact that this document has formally been withdrawn.²²⁵

An agency must “consider every significant aspect of the environmental impact of a proposed action.” *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council*, 462 U.S. 87, 107 (1983) (quotations and citation omitted). This includes the disclosure of direct, indirect, and cumulative impacts of its actions, including climate change impacts and emissions. 40 C.F.R. § 1508.25(c). Although an agency has discretion to choose among reliable methodologies for evaluating impacts, that discretion does not allow the agency to provide no evaluation whatsoever when a generally accepted methodology is available. 40 C.F.R. § 1502.22(b)(4). The need to evaluate such impacts is bolstered by the fact that “[t]he harms associated with climate change are serious and well recognized,” and environmental changes caused by climate change “have already inflicted significant harms” to many resources around the globe. *Massachusetts v. EPA*, 549 U.S. 497, 521 (2007); see also *id.* at 525 (recognizing “the

²²² See also Exhibit A at 52-53 (providing more background on social costs of carbon tool).

²²³ Exec. Order. No. 13,783 § 5(b), 82 Fed. Reg. 16,093 (Mar. 28, 2017).

²²⁴ Richard L. Revesz et al., Best Cost Estimate of Greenhouse Gases, 357 SCIENCE 6352 (2017) (explaining that, even after Trump’s Executive Order, the social cost of greenhouse gas estimate of around \$50 per ton of carbon dioxide is still the best estimate), available at http://policyintegrity.org/files/publications/Science_SCC_Letter.pdf

²²⁵ U.S. Interagency Working Group on the Social Cost of Greenhouse Gases (IWG), Technical support document: Technical update of the social cost of carbon for regulatory impact analysis under executive order 12866 & Addendum: Application of the methodology to estimate the social cost of methane and the social cost of nitrous oxide (August 26, 2016).

enormity of the potential consequences associated with manmade climate change.”). Failing to perform such analysis undermines the agency’s decision-making process and the assumptions made.

XIV. BLM’s Analysis of Impacts on Soil and Water Quality is Deficient

BLM’s analysis of soil and water quality impacts is extremely cursory. The EA fails to quantify how much soil could be lost from steep slopes along the access road and well pad, and sedimentation impacts that could result from these “severe” and “moderate” erosion hazards,²²⁶ including the degree to which sediment loading could impact water quality of nearby streams. It further fails to identify the streams that could be impacted by sedimentation and runoff—it appears that a tributary of Witten Fork is onsite, and that the access road ends at Benwood Road, near the intersection of Millers Fork and Witten Fork,²²⁷ but because the EA provides no description of the location of streams in relation to the well pad and access road, it is impossible to tell. With thousands of truck trips expected to occur along the steep access road, the sedimentation and polluted runoff impacts (exacerbated by exhaust pollution from those trucks) may be significant, but the EA does not provide any meaningful analysis of this issue.

The EA speaks in vague, general terms, noting only that “when precipitation is high it is likely that there will be *some* soil erosion in areas surrounding the well pad,” without quantification of that effect.²²⁸ Likewise, no fact-based analysis supports the EA’s statement that “the incremental effect of truck traffic...on soils...would be small”; the EA itself fails to acknowledge the enormous number of truck trips required to support the well operations.²²⁹ Further, the EA only acknowledges a “risk” that soil sediment “could run-off into the Little Muskingum River,” without any assessment of whether this is a near certain risk or negligible risk, and how severe the impact could be. Given that this area of the state receives a fair amount of precipitation, the proximity of Witten Fork (a tributary of the Little Muskingum), and the potential existence of a Witten Fork tributary onsite,²³⁰ runoff pollution seems highly likely. The EA must estimate the amount of sedimentation and runoff to be expected, including potential pollutants that may be carried away by runoff (e.g., diesel particulate matter, grease, proppants, hazardous chemicals), the specific streams that may be impacted, and the potential level of water quality degradation. See Exhibit A at 23-24.

Runoff pollution, sedimentation, and any spills impacting Witten Fork and the Little Muskingum River (or Millers Fork) could have severe consequences on these streams and sensitive species. Little Muskingum River and Witten Fork are both listed as as superior high quality water.²³¹

These designations are based on their high “Index of Biotic Integrity” (IBI) values.²³² To determine IBI values, Ohio EPA collects samples from fish and stream habitats.²³³ “The Index of Biotic

²²⁶ Rolland EA at 28-29.

²²⁷ Center for Biological Diversity, Rolland Well Pad and Access Road Map (Nov. 2017) (Ex. H).

²²⁸ Rolland EA at 29.

²²⁹ *Id.* at 30.

²³⁰ See ODNR Permit, Rolland A 1H at 6.

²³¹ See Section III above (discussing designation); see also OAC 3745-1-05 (A)(10)(b) (defining superior high quality water); Ohio Environmental Protection Agency, State of Ohio Water Quality Standards, Chapter 3745-1 of the Administrative Code (July 1, 2014) at 32, 35 (Table 5-4 noting listings).

Integrity (IBI)...are scores based on the performance of the biotic community.”²³⁴ The samples collected in 2002 resulted in Little Muskingum River IBI values of 46 and 50.²³⁵ The IBI value for waters near the project site (upstream from Witten Fork) even improved in 2015, increasing to 54.²³⁶ These streams have remained superior quality due to their remote location and the fact that few discharges flow into these streams.²³⁷

The high IBI scores for this reach of the Little Muskingum River and Witten Fork have also led to their designation as “exceptional warmwater habitat.”²³⁸ This designation means “waters capable of supporting and maintaining an exceptional or unusual community of warmwater aquatic organisms having a species composition, diversity, and functional organization comparable to the seventy-fifth percentile of the identified reference sites on a statewide basis.”²³⁹ In 2016, Ohio EPA confirmed this designation should continue to apply to the Little Muskingum, and upgraded Witten Fork (including the area immediately downstream of the project site) to this status based on its “exceptional fish and macroinvertebrate community.”²⁴⁰

Maintenance of these streams as exceptional warmwater habitat is particularly important because they both support fish populations that are declining throughout the rest of the state.²⁴¹ The reach of the Little Muskingum River near and downstream from the project site provides “good habitat” supporting rosyface shiner, muskellunge, and brindled madtom.²⁴² Witten Fork provides “good to excellent habitat” supporting “good population[s] of four sensitive headwater declining species”-- southern redbelly dace, rosyface shiner, mimic shiner, and brindled madtom.²⁴³

Both of these waters have also been designated agricultural water supply waters (waters suitable for irrigation) and “primary contact” recreation waters,²⁴⁴ or waters that “during the recreation season, are suitable for one or more full body contact recreation activities” (e.g., wading, swimming, or kayaking).²⁴⁵ The Forest Service has recognized the Little Muskingum River’s exceptional recreational

²³² Tel. communication between Elise Ferguson, Center for Biological Diversity and Chris Skalski, Ohio EPA on Nov. 29, 2017; *see also* OAC 3745-1-07(C), Table 7-1 (noting criteria for exceptional warmwaters) (“Ferguson-Ohio EPA Tel. Comm.”).

²³³ Ferguson-Ohio EPA Tel. Comm.

²³⁴ Ohio Environmental Protection Agency, Beneficial Use Support Document, Little Muskingum River Basin, Division of Surface Water Ecological Assessment Section (Oct. 2016) at 4, Table 1 (“Ohio EPA 2016”).

²³⁵ Ohio Environmental Protection Agency, Appendix 1: Ohio Streams and Rivers Antidegradation Tier Justification, SRW & SHQW, Division of Surface Water, 121 (March 26, 2002) (“Ohio EPA 2002”).

²³⁶ Ohio EPA 2016 at 4, Table 1.

²³⁷ Ferguson-Ohio EPA Tel. Comm.

²³⁸ *Id.* at 2.

²³⁹ OAC 3745-1-07(B)(1)(c).

²⁴⁰ *Id.*

²⁴¹ Email Comm. from Keith Orr, Ohio EPA to Elise Ferguson, Center for Biological Diversity (Nov. 30, 2017).

²⁴² Ohio EPA 2002 at 121.

²⁴³ Ohio EPA 2002 at 264.

²⁴⁴ Ohio EPA 2016 at 9-11.

²⁴⁵ OAC 3745-1-07(B)(3)(b).

value, in creating the National Forest Covered Bridge Scenic Byway, which crosses the Wayne.²⁴⁶ The Little Muskingum River watershed is also valued for its unique hiking, hunting, camping, and fishing opportunities.²⁴⁷

It is unclear to what extent best management practices will be required, or are purely voluntary—the EA only mentions “recommended” BMPs.²⁴⁸ The EA also fails to identify the specific measures contemplated or imposed by ODNR and/or BLM to mitigate spill and runoff impacts, performance standards these measures must meet, and their effectiveness. With respect to accidental surface spills, the EA simply mentions that spills must be reported and vaguely refers to “properly handling spills when they occur,” which does not address spill prevention and minimization. Unenforceable measures and conclusory statements lacking factual support cannot support a finding of no significant impact.

To the extent the Rolland EA suggests that fracking chemical disclosure requirements would somehow mitigate impacts on water quality or public health, this suggestion is baseless and does not somehow fulfill BLM’s duty to disclose and analyze those chemicals in the EA. The Rolland EA makes an unexplained reference to the Colorado Oil and Gas Conservation Commission’s requirement for operators to disclose fracking chemicals,²⁴⁹ but that agency’s rules do not apply here. Rather, Ohio law requires well owners to submit to the chief of the Ohio Department of Natural Resources (ODNR), Division of Oil and Gas Resources Management (DOGRM) non-proprietary drilling and fracturing chemical information within 60 days of completing drilling and fracturing operations. ORC 1509.10(A)(10) and (B)(3); ORC 1509.10(F). Because proprietary information may be kept secret, a large number of chemicals and their properties may never be disclosed to the public.

Further, Ohio law contains problematic restrictions on the disclosure of *proprietary* oil and gas chemical information, which may be necessary when a spill or other accidental exposure occurs. Ohio law requires proprietary chemical disclosure only under certain narrow circumstances, and only to certain medical professionals and the chief of DOGRM.²⁵⁰ First responders (other than diagnosing and treating medical professionals), OEPA, and drinking water utilities have no legal authority under Ohio law to require the disclosure of proprietary oil and gas chemicals.²⁵¹ Similarly, DOGRM and applicable medical professionals are not permitted to disclose proprietary information to first responders, OEPA, or

²⁴⁶ U.S. Dep’t of Agriculture, Forest Service, Covered Bridge Scenic Byway, *available at* <https://www.fs.usda.gov/recarea/wayne/recarea?recid=6216>; *see also* U.S. Forest Service, Little Muskingum Watershed Assessment, Ecosystem Analysis (2002), 2-44, 4-123-4-125.

²⁴⁷ *Id.*

²⁴⁸ Rolland EA at 30.

²⁴⁹ Rolland EA at 26.

²⁵⁰ Medical professionals diagnosing or treating an affected patient are legally entitled to proprietary chemical information, but are prohibited from disclosing that information beyond purposes related to treatment or diagnosis of the patient. ORC 1509.10(H). The sole remaining proprietary disclosure requirement under Ohio law is found at ORC 1509.10(J). This section entitles the chief of DOGRM to request proprietary oil and gas chemical information if said information is necessary to respond to a spill, release, or investigation. However, that same section prohibits DOGRM from disclosing that information to any other persons or entities.

²⁵¹ *See* ORC 1509.10.

drinking water utilities. As a result, information vital to the safety of entire communities can be slow-incoming or completely unavailable during emergency situations.

The flaws in Ohio's regulation of proprietary oil and gas chemicals was on display during the 2014 Eisenbarth well pad disaster, which occurred approximately 2 miles from the boundary of the Wayne's Marietta Unit.²⁵² Beginning on June 28, a large fire erupted at the pad and burned for several days, consuming tens of thousands of gallons of chemicals.²⁵³ 25 residences were evacuated.²⁵⁴ An estimated 70,000 fish were killed in the nearby Opossum Creek.²⁵⁵ The U.S. EPA pollution report (POLREP #1) discloses that the well pad's servicer, Halliburton, did not provide OEPA and USEPA with applicable proprietary chemical information until 6 days into the incident, on July 3rd.²⁵⁶ Understandably, drinking water utilities in Ohio are concerned about their inability to demand or acquire proprietary oil and gas chemical information during emergency situations.²⁵⁷

Finally, with respect to water withdrawal impacts, the EA presents a jumble of facts about the supposed water source and its flows, but fails to draw any connection between this information and the potential impact of large water withdrawals on stream flows, species, and downstream users, including cumulative impacts in connection with other fracking operations. The EA must be revised to address the rate of water withdrawals and how those water depletions could impact stream flows and their significance.

XV. The EA arbitrarily rejects analyzing various other impacts

The EA eliminates wholesale certain impacts from environmental study, including socioeconomic, environmental justice, visual resources, forests, and fires and fuels, without reasoned analysis or evidentiary support. For example, with respect to visual resources, the EA claims that because the well pad is "at the top of a hill in a rural location, infrastructure on [the] pad would be difficult to see from nearby roads."²⁵⁸ This seems highly unlikely given that large 150 feet high rigs and auxiliary equipment covering a 14,000 square foot area are typically used for horizontal drilling operations.²⁵⁹ Further, the razed top of a 900+ foot hill would be very conspicuous in a rural location.²⁶⁰ Moreover, the EA provides no indication of what roads are at issue, their proximity to the well pad, and

²⁵² See U.S. Environmental Protection Agency Pollution/Situation Report, Statoil Eisenbarth Well Response (POLREP #1) (June 29, 2014).

²⁵³ *Id.*

²⁵⁴ *Id.*

²⁵⁵ *Id.*

²⁵⁶ *Id.* at p. 8.

²⁵⁷ See, e.g., June 7, 2017 Legislative Testimony of Richard Stuck, PG, Source Water Protection Manager Greater Cincinnati Water Works (regarding inability of Cincinnati drinking water utility to acquire applicable chemical information during Eisenbarth incident).

²⁵⁸ Rolland EA at 17.

²⁵⁹ NYDEC, Final Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program, Regulatory Program for Horizontal Drilling and High-Volume Hydraulic Fracturing to Develop the Marcellus Shale and Other Low-Permeability Gas, Vol. 1, 5-21 (May 2015).

²⁶⁰ See Ex. J, Hazelbaker Decl., Ex. C (attached to Hazelbaker Decl.) (photograph showing mountain top removal for a well pad in Monroe County).

how high the well pad is above these roads, and thus fails to support a finding that no visual impact would result. It also fails to consider visual resource impacts on recreationalists in the Little Muskingum, which is only a quarter mile away from the well site.

BLM's reasoning for failing to consider socioeconomic and environmental justice impacts is deeply flawed. The fact that there are few residences in the vicinity of the project area does not excuse ignoring potentially disproportionate impacts on low-income communities, including cumulative impacts of air and water pollution on whole communities, caused by fracking within the administrative boundary of the Wayne and surrounding areas. Nor should socioeconomic impacts be passed over. Industrial development near rural communities would potentially result in industrial blight and a decline in property values, imposing costly economic and health burdens on residents.²⁶¹ BLM only acknowledges potential economic benefits in the form of royalties and an increased tax base, without addressing potential costs to local communities and residents.²⁶²

In addition, BLM inexplicably fails to consider impacts to forests and fire risks. As noted previously, forest surrounds the project site. Further, multi-well pad development and fracking poses an increased risk of fire due to the close spacing of wells, and the storage of volatile or flammable chemicals and explosives on the well pad,²⁶³ but the EA fails to acknowledge these risks. Indeed, well pad fires have caused fires in or near forested areas, including near the Wayne National Forest,²⁶⁴ and could threaten national forest lands which are less than a mile from the well pad site.²⁶⁵ Pipeline explosions pose another serious fire risk.²⁶⁶

XVI. The EA's cumulative impacts analysis is flawed and incomplete

Repeatedly, throughout the EA, BLM minimizes the project's incremental contribution to cumulative impacts, by suggesting that because such contribution would only amount to one-third of the operations on the well pad, any resulting impacts are not cumulatively significant, and even "negligible."²⁶⁷ This reasoning is flawed as it overlooks whether the proposed operations, *in connection with other past, present, and future activities*, result in a cumulatively significant impact, such as

²⁶¹ Rowell, Andy, Fracking Affects Property Prices, Oil Change International (Jan. 26, 2016), <http://priceofoil.org/2016/01/26/fracking-affects-property-prices/>.

²⁶² Rolland EA at 17.

²⁶³ Hagshenas, A. et al., Fire on closely spaced six-well pad illustrates heightened need for well control risk mitigation in pad drilling, Drilling Contractor, July 3, 2017; Hughes, Bill, In-Depth Review of the Statoil Well Pad Fire, FracTracker Alliance, Sept. 8, 2014.

²⁶⁴ *Id.*; see also Ventura County Star Staff Reports, Petroleum fire contained near Fillmore, Ventura County Star (Aug 8, 2012); Carlson, Cheri, Cause of Hopper Canyon Oil Tank Fire Undetermined, Ventura County Star, May 7, 2015; U.S. Forest Service, Wildland Fire Origin and Cause Supplemental Incident Report (Sept. 2, 2015); see also Fillmore Gazette Staff Writer, Burson Fire Contained, Helicopters Buzz Fillmore for Water, Fillmore Gazette, Sept. 9, 2015; Ventura County Star, Crews Battle 15-20 Acre Brush Fire North of Fillmore, Ventura County Star, Sept. 3, 2015; Schiebe, John, Fire no longer burning in petroleum storage tanks near Fillmore, Journal Media Group, Apr. 1, 2016, (describing well pad incidents in the Sespe oil field in Los Padres National Forest).

²⁶⁵ See Ex. H (CBD Map of Well Pad and Access Road).

²⁶⁶ Kelso, Matt, Oil and gas explosions are fairly common, FracTracker Alliance, July 18, 2012.

²⁶⁷ See, e.g., Rolland EA at 34.

exceedance of a health-based standard, as explained in section VIII(III) above. By simply relying on relative comparisons (and vague qualitative descriptors, such as “minor” or “some” or “greater”), BLM performs its analysis in a vacuum, without any sense of the actual absolute volumes of waste, tons of pollution, or acres of disturbance at issue, the surrounding context, and the concrete effects. For example, the question is not whether the proposed project will result in a relatively large amount of water pollution compared to other sources, but what specific levels of water pollution can be expected from both the proposed project and other pollution sources, how sensitive is the stream resource, do those pollution levels violate or significantly undermine ecological integrity or health standards, and would reducing the project’s effects avoid a violation? BLM must revise the EA to concretely address the effects of the proposed action and its cumulative effects, rather than obfuscating these effects through meaningless comparisons.

Finally, like the Leasing EA, the Rolland EA fails to acknowledge or analyze the potential cumulative effects of the proposed project in connection with a number of projects within southeast Ohio that could potentially impact air quality, water resources, public health and safety, and seismicity. Exhibit F discusses a number of these projects, including the Rover Pipeline, PTT Global Chemical ethane cracker, Energy Storage Ventures gas storage project along the Ohio River in Monroe County, Royal Dutch Shell’s cracker plant, and multiple horizontal drilling projects already ongoing in southeastern Ohio. BLM must conduct a thorough analysis of the cumulative effects of the proposed wells in connection with the dozens of horizontal-well, refinery, pipeline, storage, and other oil and gas development projects in and around the Wayne National Forest.

In sum, BLM has failed to disclose or adequately analyze numerous impacts of the proposed horizontal well project on numerous environmental resources and public health. From the little information that it has disclosed, it is clear that many of the assumptions and analysis in its prior programmatic reviews are flawed. BLM must not allow this project or any other new wells in the Wayne National Forest until these deficiencies are corrected in a programmatic EIS, and until it fully discloses the proposed project’s environmental impacts.

Thank you for considering our comments.

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EXHIBIT D

January 24, 2017

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Re: Supplemental Comments on Environmental Assessment for Rolland Applications for Permit to Drill (DOI-BLM-Eastern States-0030-2017-0008-EA), submitted by Center for Biological Diversity, Athens County Fracking Action Network, Buckeye Environmental Network, Heartwood, Keep Wayne Wild, Ohio Environmental Council, and Sierra Club

Dear Mr. Wadzinski:

The BLM did not provide the public with copies of the Rolland APDs as part of the public comment process on the Rolland Draft EA (DOI-BLM-Eastern States-0030-2017-0008-EA). The undersigned parties received redacted copies of the Rolland APDs on December 29, 2017 – in response to a FOIA request dated November 15, 2017. We submit this supplemental comment based on our review of the redacted APDs.

I. The Rolland EA Arbitrarily and Capriciously Fails to Adequately Examine Surface Disturbance Impacts Disclosed in the Rolland APDs.

Information in the Rolland APDs regarding surface disturbance impacts requires supplemental environmental review before BLM can rely on the Leasing EA (DOI-BLM-Eastern States-0030-2016-0002-EA) or the Rolland EA for any drilling approvals. This information also serves to further support many of the concerns plaintiffs raise in the pending lawsuit challenging BLM's leasing in the Wayne National Forest. Until the lawsuit is resolved and these deficiencies in the Leasing EA are corrected, BLM should refrain from permitting the APDs or any other new wells in the Wayne National Forest.

The 2006 Forest Plan and Final EIS placed an upper limit on surface disturbance from oil and gas well sites in the Marietta Unit of 135 acres of short-term disturbance and 59 acres of long-term, post-reclamation disturbance.¹ Although not acknowledged in the Leasing EA, the 2006 Forest Plan also limits utility line disturbance (including oil and gas lines) for all three units of the Wayne National Forest to a total of 50 acres.² The Leasing EA estimates the disturbance footprint from horizontal well pad sites to be 3 to 5.5 acres. It further estimates that the average

¹ See Leasing EA at 24; 2006 FEIS Appendix G, Table G-1, p. G-1.

² SIR, p. 43 (Table 6), p. 75 (Table 13); 2006 FEIS, e.g. p. 3-21 (Table 3-6).

access road would disturb 2 acres, and that the average gathering line would disturb 0.5 acres when co-located with the access road.³

The Rolland EA, for its part, states that the Rolland well pad “has a short and long-term surface disturbance of approximately 4 acres.”⁴ The Rolland EA later contradicts this statement when it states that the surface disturbance from the construction of the access road and well pad “affected approximately 24 acres.”⁵ As the undersigned now know, both APDs list the long and short term disturbance from the access road as 10 acres and the long-term and short-term disturbance for the well pad as 24.59 acres.⁶ This reported footprint dwarfs the 3 to 5.5 acre well site and 2 acre road estimates provided in the Leasing EA. Nonetheless, the Rolland EA fails to discuss or unpack this sizable discrepancy.

Furthermore, the Rolland EA fails to mention, let alone consider, surface impacts from gathering pipelines. This oversight is egregious, especially given the sizable figures provided in the APDs. Both APDs list the short-term disturbance from pipelines associated with this project as 68.87052 acres and the long term disturbance as 34.43526 acres.⁷ The short term figure greatly exceeds the entire 2006 Forest Plan allotment for utility line development, and both figures dwarf the 0.5 acre estimate provided in the Leasing EA. In short, the Rolland EA’s complete failure to consider the pipeline acreage disturbance figures provided in the APDs is arbitrary and capricious. The Rolland EA and Leasing EA’s underestimates of surface disturbance mask the true impact of horizontal well development on habitat fragmentation, wildlife, surface water quality, air quality, viewsheds, vegetation, and other resources.

Per both APDs, the combined short-term disturbance from the Rolland pad, road, and pipeline totals 103.460526 acres and the combined long-term disturbance totals 69.02526 acres.⁸ Were this single horizontal project located on federal surface, it would exceed or threaten to exceed the 2006 Forest Plan’s upper limit for all oil and gas activities in the Marietta Unit (135 acres short term, and 59 acres long term) and forest-wide limit on utility lines (50 acres). In other words, this single project calls the adequacy of the 2006 Forest Plan and Final EIS, the 2012 SIR, and the 2016 Leasing EA into serious question.

The new information disclosed in the Rolland APDs raises serious questions about the adequacy of the agency’s programmatic review in the Leasing EA, and the consistency of this and similar proposed projects with the Wayne’s 2006 Forest Plan. These concerns about surface disturbance impacts have not been adequately addressed in the Rolland EA, and will continue to escape review if they are not addressed in a programmatic NEPA document. Accordingly, BLM should halt any new approvals of APDs until the Leasing EA and the Forest Plan and Final EIS have been appropriately revised.

³ Leasing EA at 25.

⁴ Rolland EA at 11.

⁵ Rolland EA at 40.

⁶ Rolland APDs at 29. (Enclosed with this comment filing).

⁷ Id.

⁸ Id.

II. The Rolland EA Arbitrarily and Capriciously Fails to Consider Potential Water Withdrawal Impacts to the Little Muskingum River.

An examination of the Rolland APDs shows that the Rolland EA incorrectly listed the Ohio River as the source of stimulation water. The Rolland EA states that the water used for well stimulation will total 29,400,000 gallons and will be sourced from the Ohio River.⁹ While the 29,400,000 gallon figure is reflected in the APDs, the source listed in both APDs is the Little Muskingum River – at a location adjacent to the well site (latitude 39.66564, longitude - 81.011246).¹⁰ In addition, the APDs list the Little Muskingum as a perennial source, but the Rolland EA states that the Little Muskingum is a “lower order” “ephemeral” stream.¹¹

It is not clear whether each well would separately withdraw approximately 30,000,000 gallons from the Little Muskingum, or whether the nearly 30,000,000 gallons is cumulative for both wells (or for all wells proposed for the well site). Either way, the agency provides no analysis of the impacts that water withdrawals – to the tune of approximately 30,000,000 gallons (or potentially much more) – could have on the Little Muskingum River. This oversight alone renders the Rolland EA fatally defective.

BLM must analyze the impacts of depleting significant amounts of water from the Little Muskingum on water quality and quantity, recreational values, aquatic species and habitat, and other wildlife that depend on these creeks.

III. The Rolland EA and APDs Fail to Disclose How Produced Water Will Be Disposed.

The APDs do not identify where or how produced water (i.e., “brine” or “wastewater”) will be disposed. Under Onshore Order No. 1, the Surface Use Plan of Operations “must contain a written description of the methods and locations proposed for safe containment and disposal of each type of waste material... that results from drilling the proposed well.” The applicant declined to answer this part of the form (or answered “no” to all forms of waste disposal).¹² Onshore Order 7 also makes disposal of produced water from a federal lease subject to BLM approval, regardless of the physical location of disposal. The Rolland EA states that all wastes, including produced water, will be “disposed of at applicable state permitted commercial treatment/disposal facilities.”¹³ However, it is not clear how the agency draws this conclusion, as no information regarding disposal method or disposal location of produced water is provided in the APDs. BLM should require Eclipse Resources to provide specific information about the location and type of produced water disposal facilities it plans to use, and analyze the site-specific transportation, air quality, water quality, public health, and other impacts of disposing the project’s waste materials.

⁹ Rolland EA, p. 37.

¹⁰ APDs, PDF page 26 of 41.

¹¹ APDs, PDF page 26; Rolland EA, p. 37.

¹² APDs, PDF pages 38-40.

¹³ Rolland EA at 12.

IV. Conclusion.

The foregoing comments supplement the Rolland EA comments submitted by the undersigned parties on November 30, 2017. We submit these comments because our review of the Rolland APDs revealed several significant flaws in BLM's analysis. BLM did not provide the Rolland APDs to the public as part of the public involvement process it held with respect to the Draft Rolland EA. We received redacted versions of the Rolland APDs only on December 29, 2017, after submitting a public records request to BLM on November 15, 2017.

In sum, BLM has failed to adequately analyze numerous impacts of the proposed horizontal well project on numerous environmental resources and public health. It is also clear that many of the assumptions and analysis in its prior programmatic reviews are deeply flawed. BLM must not issue leases or permits for this project, or approve any other new wells in the Wayne National Forest, unless and until these deficiencies are corrected in a programmatic EIS.

Thank you for considering our comments.

Sincerely,

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