June 7, 2018

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VIA Electronic mail

Subject: Greater Chapita Wells Natural Gas Infill Project Draft EIS, DOI-BLM-UT-G010-2014-0004-EIS

Dear Ms. McCullough,

Thank you for accepting these comments submitted by Environmental Defense Fund ("EDF").[1] EDF is a national membership organization with over two million members residing throughout the United States and in Utah many of whom are deeply concerned about the pollution emitted from oil and natural gas sources.

I. Introduction

EOG Resources, Inc. (EOG) proposes to double the number of wells in the Greater Chapita Wells Project Area (GCWPA) and increase ozone precursor and climate-altering emissions in the area by thousands and millions of tons, respectively. These emissions will be added to an airshed that is already battling degraded air quality, thereby making it more difficult for the area to come back into compliance with national health-based standards for ozone. The GCWPA is located within the Uintah Basin, an area that EPA recently designated as nonattainment with the 2015 ozone National Ambient Air Quality Standards (NAAQS). While EOG has scaled back its original development proposal and committed to implement a suite of measures to reduce emissions in light of the area's unhealthy air, more must be done to protect the air quality in the GCWPA. For instance, while EOG has committed to certain emissions reduction measures, including not allowing any increase in VOC emissions from new wells above a 2012 baseline, these measures are not sufficient. The DEIS and technical support documents clearly demonstrate that the planned project will lead to a dramatic increase in NOx, VOC, and methane emissions that will have a deleterious effect on air quality. These emissions also represent waste of a valuable product and will result in foregone royalties for BLM and taxpayers, in derogation of BLM's mandatory duty

[1] In submitting these comments, EDF fully incorporates as if set forth herein the other comments that EDF, along with Montana Environmental Information Center, Institute for Policy Integrity at New York University School of Law, Natural Resources Defense Council, Sierra Club, and Union of Concerned Scientists, submitted regarding the Greater Chapita Wells Natural Gas Infill Project to BLM on June 7, 2018.

to minimize waste and "receive fair market of the use of the public lands and their resources."[2] Despite this fact, BLM has not proposed any additional emission or waste reduction measures and BLM has failed to adequately consider lower emitting alternatives. The pervasive problem of alarmingly high and unhealthy ozone levels in the Uintah Basin, along with its duty to minimize waste and "receive fair market of the use of the public lands and their resources" demands that BLM carefully evaluate all alternatives, including the no action alternative and lower emitting alternatives that would further reduce emissions and waste from existing sources in the Basin. BLM's failure to do these things represent fatal flaws in the Draft Environmental Impact Statement (DEIS) in light of BLM's mandates to prevent undue degradation to air quality and prevent waste.[3]

II. Overview of Project and BLM's Preferred Alternative

The GCWPA is located in the Uintah Basin. EPA has designated portions of the Basin as a nonattainment area for the 2015 Ambient Air Quality Standard for Ozone, in light of years of wintertime exceedances of the standard.[4] The GCWPA is currently home to 1,247 active natural gas wells located on 960 pads.[5] BLM administers the majority (76% of the surface and 91% of the mineral) of the interests in the GCWPA.[6] The remainder is owned by the Ute Tribe, state, and private parties.[7]

EOG proposes to drill up to 2,808 new wells, construct up to 233 new well pads and potentially expand the total 960 existing well pads in the GCWPA. In recognition of the significant air quality problem in the Basin, EOG reduced the scope of its project by 60% and has proposed certain air quality mitigation measures. Specifically, EOG has proposed to: capture gas during well testing operations, retrofit existing pneumatic controllers with low or no-bleed controllers, use low or no-bleed pneumatic devices on separator/dehydration units, connect 51% of new wells to a liquids gathering system (LGS) and approximately 49% of existing wells will be connected to the LGS, conduct annual AVO leak inspections for existing wells, develop an Ozone Management Action Plan and ensure that new stationary sources will not result in net increases of VOC emissions within the GCWPA from a 2012 baseline year.[8] While the implementation of the LGS will reduce VOC emissions from existing wells and central facilities by 199,780 tpy over the life of the project, drilling, completion, and production activities nevertheless will still emit ozone precursor and methane emissions to the atmosphere which are projected to interfere with attainment of the 2015 NAAQS.

BLM's preferred alternative differs only modestly from EOG's proposal by reducing the number of proposed well pads from 233 to 162. However, EOG would be allowed to drill the same number

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[2] 43 U.S.C.A. § 1701(a)(9).
[3] Fed. Land Policy & Mgmt. Act, 43 U.S.C. §§ 1701(a), 1732(b); 43 C.F.R. § 3809.5; Mineral Leasing Act, 30 U.S.C. § 225.
[4] U.S. Envt'l Protection Agency, *Utah: Northern Wasatch Front, Southern Wasatch Front, and Uinta Basin, Final Area Designations for the 2015 Ozone Nat'l Ambient Air Quality Standards Tech. Supp. Doc.*, p. 2 (April 30, 2018) (*available at* https://www.epa.gov/sites/production/files/2018-05/documents/ut_tsd_final.pdf).
[5] Draft Environmental Impact Statement ("DEIS"), p. 1-1.
[6] DEIS, p. 1-5.
[7] DEIS, p. 1-1 (Out of the 43,071 acres in the GCWPA, the Ute Tribe owns 6,577 acres, the State of Utah owns 1,954 acres, and private parties own 1,680 acres).
[8] DEIS, pp. 2-31 – 2-33; see also Appendix C setting forth EOG's Air Quality Management Strategy.

of wells (up to 2,808) and expand the same number of existing well pads. BLM has not proposed any additional air quality mitigation measures to those included in EOG's proposal. According to the DEIS, the preferred alternative will contribute 66,232.9 tons of VOCs to the regional airshed over the lifetime of the project.[9] The project will also contribute 5.9 MMTCO2e of methane emissions over this timeframe.[10]

While we commend EOG on modifying the scope of its project and proposing measures to reduce emissions, the DEIS demonstrates that much more must be done to protect air quality from further degrading in the area and minimize waste. Even with the commitment to cap VOC emissions from new wells to 2012 levels, the project will still result in an additional 66,232.9 tons of VOCs and 5.9 MMTCO2e of methane over the lifetime of the project. In addition, the Air Quality Technical Support Document demonstrates that the project will result in increased NOx emissions from drilling and completion activities associated with new wells[11] as well as formaldehyde emissions from flaring.[12] Formaldehyde is a highly reactive VOC that contributes to ozone formation.[13] Uncontrolled existing sources, in particular blowdown emissions, will contribute VOC emissions.[14] As a result of the release of these ozone precursor emissions, modeling conducted by BLM demonstrates that ozone concentrations would exceed the ozone NAAQS in portions of the Uintah Basin.[15] Additional exceedances of the ozone NAAQS in an area that already fails to meet the ozone NAAQS is untenable and violates FLPMA's mandate that BLM not cause undue degradation to air quality.[16] Moreover, in the event that EPA promulgates a Federal Implementation Plan for the Basin, EOG will discontinue the use of its mitigation measures, which will raise even more serious questions about the viability of the project.[17]

BLM's failure to propose any additional measures to protect air quality and minimize waste in the project area is highly problematic in light of the current air quality and the availability of cost-effective measures to further reduce ozone precursor and methane emissions. As BLM recognizes in the DEIS, the Uintah Basin suffers from the same kind of air quality problem as the Upper Green River Basin in neighboring Wyoming.[18] Faced with the same wintertime ozone formed by oil and gas emissions, Wyoming instituted strong rules requiring operators to conduct quarterly leak detection and repair inspections, control VOC emissions by 98% from existing glycol dehydrators and storage tanks with actual emissions of 4 tpy of VOCs, and control emissions from pneumatic pumps.[19] Similarly, Colorado has instituted a suite of measures to reduce hydrocarbons from new and existing oil and gas facilities in the Denver ozone nonattainment area, including quarterly and monthly leak detection and repair inspections, 95% or better controls on storage tanks and glycol dehydrators, measures to reduce venting during well unloading, and measures to reduce venting

[9] Id. at p.4.3-12, Table 4.3-3. This number takes into consideration the estimated reductions anticipated by use of the LGS.
[10] DEIS, p. 5.14, Table 5-7.
[11] DEIS App'x J, p. J-7.
[12] *Id.* at J-77.
[13] *Id.*
[14] *Id.*
[15] *Id.* at p.4.3-22.
[16] Fed. Land Policy & Mgmt. Act, 43 U.S.C. § 1701(a)(8).
[17] DEIS, App'x C, p. C-27.
[18] DEIS, pp. 2-14 – 2-15.
[19] Wyo. Code R. Ch. 8, § 6.

from compressors.[20] All of these measures could be applied to EOG's existing and new equipment in the Basin, which could help ensure that the air quality in the Basin improves, consistent with CAA requirements, and reduce waste.

BLM's failure to require additional air emission reduction measures beyond what EOG has proposed is particularly problematic in light of the fact that BLM has proposed to rescind or scale back its own waste prevention rule.[21] This rule rules require operators to reduce waste and methane emissions from the venting and flaring of associated gas, liquids unloading activities, storage tanks, pneumatic devices and pumps—all major sources of waste and emissions. Indeed, BLM's own analysis of its rescission and revision proposal demonstrates that the action, if finalized, will result in a significant drop in natural gas production on public lands – as much as 299 billion cubic feet of natural gas – enough energy to heat nearly 500,000 homes each year for the next ten years. The BLM also found that its plan would cost Americans more than $1 billion dollars in wasted natural gas and pollution. ($824 million worth-of natural gas; $259 million in lost public benefits due to increased methane emissions).

III. BLM's Inventory Estimates Likely Underestimate Emissions, Indicating that its Modeling is Likely Incorrect

The DEIS contains an estimate of VOC emissions from the proposed Project. According to the DEIS' estimates based on the BLM's inventory, the Project is expected to emit 66,232.9 tons of VOCs through the life of the Project.[22] In addition, all oil and gas projects in the Uintah Basin, Project included, are estimated to contribute 325,661 tpy of VOCs and 1,101,674.8 tpy of methane throughout the life of the Project.[23] These numbers likely significantly underestimate actual emissions, as a series of scientific studies demonstrate that measured emissions are magnitudes higher than estimates based on emission factors and engineering calculations.

A. Field Studies Using Direct Measurement Demonstrate that Actual Emissions are Significantly Higher than Inventories Estimations

Until recently, regulators have relied nearly exclusively on emission inventories to understand the magnitude of a pollution problem as well as the potential reductions associated with a proposed solution. Now however, recent advances in science have added to our knowledge and understanding of emissions from oil and gas facilities. These studies demonstrate that emissions are systematically significant and, at a select number of facilities, actual emissions are magnitudes higher than emission inventories suggest. From a policy standpoint, they point clearly to the need for frequent inspections to identify abnormal operating conditions and malfunctioning or defective equipment.

A recent series of studies in the Barnett—incorporating both top-down and bottom-up

[20] Colorado Reg. 7 Sections XII, XVII and XVIII.
[21] DEIS, pp. 4.3-41 – 43, Table 4.3-29.
[22] DEIS, p. 4.3-12, Table 4.3-3.
[23] DEIS, Appendix K, pp. K-231, Table 203.

measurement—found that emissions were 50 percent greater than estimates based on the GHGI.[24] The studies partially attributed these large emissions to high emission sites not reflected in inventories, which focus on average emission factors. One study in particular found that a small number of sources are responsible for a disproportionate amount of emissions, noting specifically that "sites with high proportional loss rates have excess emissions resulting from abnormal or otherwise avoidable operating conditions, such as improperly functioning equipment."[25]

In addition, a helicopter study of 8,220 well pads in seven basins, including over 1,000 sites in the Uintah Basin, confirms that leaks occur randomly and are not well correlated with characteristics of well pads, such as age, production type or well count.[26] That study focused only on very high emitting sources, given the helicopter survey detection limit which ranged from 35–105 metric tons per year of methane. The paper reported that emissions exceeding the high detection limits were found at 327 sites. 92 percent of the emission sources identified were associated with tanks, including some tanks with control devices that were not functioning properly and so could be expected to be addressed through a leak detection and repair program. While the study did not characterize the individually smaller but collectively significant leaks that fell below the detection limit, it nonetheless confirms that high-emitting leaks occur at a significant number of production sites and that total emissions from such leaks are very likely underestimated in official inventories. Other studies have found similar results:

- **Phase I, University of Texas**. This study found that emissions from equipment leaks, pneumatic controllers and chemical injection pumps were each 38%, 63% and 100% higher, respectively, than as estimated in national inventories.[27] This study also found that 5% of the facilities were responsible for 27% of the emissions.[28]
- **Phase II, University of Texas**. Two follow-up studies focused specifically on emissions from pneumatic controllers and liquids unloading activities at wells found similar results.[29] Specifically, the studies found that 19 percent of the

[24] Harriss, *et al.*, (2015) "Using Multi-Scale Measurements to Improve Methane Emissions Estimates from Oil and Gas Operations in the Barnett Shale, Texas: Campaign Summary," *Environ. Sci. Technol.*, **49**, ("Harriss (2015)"), *available at* http://pubs.acs.org/doi/abs/10.1021/acs.est.5b02305http://pubs.acs.org/doi/abs/10.1021/acs.est.5b02305http://pubs.acs.org/doi/abs/10.1021/acs.est.5b02305 (providing a summary of the 12 studies that were part of the coordinated campaign).

[25] Zavala-Araiza, *et al.*, (2015) "Toward a Functional Definition of Methane Super-Emitters: Application to Natural Gas Production Sites," *Environ. Sci. Technol.*, **49**, at 8167−8174 ("Zavala-Araiza (2015)"), *available at* http://pubs.acs.org/doi/pdfplus/10.1021/acs.est.5b00133.

[26] Lyon, et al., "Aerial Surveys of Elevated Hydrocarbon Emissions from Oil and Gas Production Sites," *Environ. Sci. Technol.*, 2016, *50* (9), pp 4877–4886, available at http://pubs.acs.org/doi/abs/10.1021/acs.est.6b00705.

[27] Allen, D.T., et al, (2013) "Measurements of methane emissions at natural gas production sites in the United States," *Proc. Natl. Acad.* 2013, 110 (44), available at http://www.pnas.org/content/110/44/17768.full

[28] *See* Allen, D.T., et al, (2014), "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers," *Environ. Sci. Technol*., 2015, 49 (1), pp. 633–640 (referencing 2013 Allen study), available at http://pubs.acs.org/doi/abs/10.1021/es5040156.

[29] Allen, D.T. et al., "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Liquid Unloadings," *Environ. Sci. Technol*., 2015, 49 (1), pp 641–648, available at http://pubs.acs.org/doi/abs/10.1021/es504016r.

pneumatic devices accounted for 95 percent of the emissions from the devices tested, and about 20 percent of the wells with unloading emissions accounted for 65 to 83 percent of those emissions. The average methane emissions per pneumatic controller were 17 percent higher than the average emissions per pneumatic controller in EPA's national greenhouse gas inventory.[30]

- **Gathering and Boosting**. The gathering and processing study found substantial venting from liquids storage tanks at approximately 20 percent of the sampled gathering facilities.[31] Emission rates at these facilities were on average four times higher than rates observed at other facilities and, at some of these sites with substantial emissions, the authors found that company representatives made adjustments resulting in immediate reductions in emissions.
- **Transmission and Storage.** In the study on transmission and storage emissions, the two sites with very significant emissions were both due to leaks or venting at isolation valves.[32] The study also found that leaks were a major source of emissions across sources, concluding that measured emissions are larger than would be estimated by the emission factors used in EPA's reporting program.

These studies demonstrate that emission inventories consistently underestimate actual emissions, which calls into question the adequacy of BLM's DEIS, in particular the emission inventory, cumulative impacts analysis, and modeling. Notably, if the inventory underestimates actual emissions, then the model may well underestimate the adverse impacts on air quality from the Project. We urge BLM to go back and revisit the emission inventory and modeling, taking into consideration the scientific information discussed above, to determine the potential extent of adverse impacts on air quality, in particular the potential for additional ozone exceedances in the Uintah Basin.

IV. BLM has Failed to Fully Consider Alternatives that Would Reduce Air Emissions and Minimize Waste by Requiring Operators to Employ Cost Effective, Technically Feasible Measures.

BLM's consideration of alternatives fails to meet NEPA requirements. NEPA, 42 U.S.C. §§ 4321-70, requires federal agencies to "take a 'hard look' at the environmental consequences" of the proposed courses of action. *Pennaco Energy, Inc. v. U.S. Dep't of Interior*, 377 F.3d 1147, 1150 (10th Cir. 2004). An EIS must "rigorously explore and objectively evaluate" all reasonable alternatives to a proposed action, in order to compare the environmental impacts of all available courses of action. *New Mexico ex rel. Richardson v. Bureau of Land Mgmt.*, 565 F.3d 683, 703-04

[30] Allen, D.T., et al, (2014), "Methane Emissions from Process Equipment at Natural Gas Production Sites in the United States: Pneumatic Controllers," *Environ. Sci. Technol*., 2015, 49 (1), pp 633–640, available at http://pubs.acs.org/doi/abs/10.1021/es5040156.

[31] Mitchell, A.L., et al, (2015) "Measurements of Methane Emissions from Natural Gas Gathering Facilities and Processing Plants," *Environ. Sci. Technol*, 2015, 49 (5), pp 3219–3227, available at http://pubs.acs.org/doi/abs/10.1021/es5052809.

[32] R. Subramanian, et al, (2015) "Methane Emissions from Natural Gas Compressor Stations in the Transmission and Storage Sector: Measurements and Comparisons with the EPA Greenhouse Gas Reporting Program Protocol," *Environ. Sci. Technol*, available at http://pubs.acs.org/doi/abs/10.1021/es5060258.

(10th Cir. 2009) (citing 40 C.F.R. § 1502.14). For those alternatives eliminated from detailed study, the EIS must briefly discuss the reasons for their elimination. *Id.*

BLM failed to fully analyze alternatives that would have reduced the amount of ozone precursor and methane emissions in the Basin.

The DEIS contains four alternatives:

(1) Alternative A. The No Action Alternative
(2) Alternative B. EOG's proposal
(3) Alternative C. BLM's preferred alternative
(4) Alternative D, which includes additional air quality mitigation measures.[33]

Alternative A would prohibit any further development in the area. Alternative B, as discussed above, is EOG's proposal. Alternative C, as discussed above, is BLM's preferred approach.

Alternative D would result in the construction of up to 157 new well pads, expansion of up to 880 existing well pads, and the drilling of up to 2,808 wells.[34] Alternative D also includes additional air quality measures including the use of Tier IV drill rig engines, controlling of VOC emissions from well site dehydrators and tanks to at least 95% efficiency, reduction in blowdown emissions at LGS-connected well sites, 75% control of emissions from pneumatic devices, at least 95% control of central facility tank emissions, controls on oil/water/gas separators, prohibition on intentional non-emergency venting, and restrictions on flaring.[35] These measures are thought to reduce VOCs by 2.1-7.5 tpy through the life of the project.[36] Notably, BLM estimates that implementation of Alternative D's requirements will not decrease the revenue from the oil and gas produced or increase the spending associated with the project.[37]

Oddly, despite the clear air quality and waste minimization benefits stemming from a reduction in ozone precursor and methane emissions, and the lack of any negative cost or production implications associated with implementing additional controls, BLM summarily dismissed Alternative D without adequate consideration.[38] BLM failed to develop a detailed emission inventory for Alternative D, and did not model the effects of implementing Alternative D.[39] Rather, BLM concluded that Alternative D would result in the same or lower emissions as the preferred alternative and therefore chose not to conduct an inventory for this reason. While it is almost certainly true that Alternative D would result in lower VOC and methane emissions, given the additional benefits, BLM's cursory dismissal of this alternative runs afoul of NEPA's requirement that agencies "take a 'hard look' at the environmental consequences" of alternatives. *Pennaco Energy, Inc. v. U.S. Dep't of Interior*, 377 F.3d 1147, 1150 (10th Cir. 2004).

[33] DEIS, Abstract p. 1.
[34] DEIS, p. 2-1.
[35] DEIS, p. 2-53, see also Table 4.3-29 (setting forth air quality design features, including additional features in Alternative D).
[36] DEIS, p. 4.3-38, Table 4.3-28.
[37] DEIS, p. ES-13, Table ES-2 (Revenues and Spending).
[38] The DEIS also fails to give adequate consideration to Alternative C by failing to estimate the additional emission reductions that are estimated to result with Alternative C's implementation, which is also a violation of NEPA's "hard look" requirement. *See* DEIS, p. 4.3-16.
[39] DEIS, p. 4.3-38.

Similarly, BLM failed to adequately consider Alternative A, the no action alternative. BLM dismissed Alternative A as a viable alternative citing the *possibility* that existing contractual obligations between the United States and EOG might foreclose the implementation of a no action alternative.[40] BLM did not conclude that existing contractual obligations do foreclose the possibility of a no action alternative, but merely that they might. This explanation fails to meet NEPA's requirements that agencies "rigorously explore and objectively evaluate" all reasonable alternatives to a proposed action. *New Mexico*, 565 F.3d 683, 703-04 (10th Cir. 2009). NEPA requires BLM to explain adequately whether in fact there are existing contractual obligations, and if there are not, then the agency must analyze the environmental impacts associated with this alternative, in particular the air quality and waste prevention benefits associated with keeping development in the Basin at current levels. *Id*. BLM must go back and determine whether existing contractual rights foreclose consideration of Alternative A, and if they do not, it must adequately analyze the potential air quality and product retention impacts of this alternative.

V. Recommendations for Additional Air Quality Mitigation and Waste Prevetion Measures

Additional technically feasible, cost-effective mitigation measures should be taken to reduce the project's impacts on air quality and to minimize waste. First, BLM should require quarterly inspections for leaks at all facilities, including leaks from abnormally operating pneumatic controllers. BLM should also require leak detection for pipelines and the LGS. Frequent instrument-based inspections are one of the best ways to reduce leaks, including leaks from improperly designed and/or operating facilities and equipment. These measures will also increase the amount of saleable product in EOG's pipelines.

In addition, BLM should require measures to reduce venting and flaring from well blowdowns, storage tanks, glycol dehydrators and oil wells. While EDF appreciates BLM's proposal to control tank and dehydrator emissions to a +95% efficiency,[41] a 98% or better efficiency will be even more effective in curtailing harmful emissions of VOCs and methane. BLM should also require EOG to capture associated gas whenever feasible, and if capture is not feasible, then require EOG to combust with flares or combustors that have at least a 98% destruction removal efficiency (DRE). Operators must avoid venting during well blowdowns, and flare any necessary venting using flares with a 98% or better DRE.

EOG should also be required to install zero bleed pneumatic devices wherever access to electricity, including renewable electricity, is available, and route emissions from any remaining natural gas-powered devices to a closed-loop system. Regardless of the exact location of a particular facility, BLM does know that the project will occur in a region that is currently home to electrical distribution lines. The existence of these current lines, and their ability to provide grid electricity to the proposed facilities, should be considered. In addition, many zero emitting technologies can be powered by solar energy, which does not require access to a grid nor is dependent on the exact location of a facility. BLM should consider the use of solar power to generate electricity for pneumatic controllers and pumps, as well as other equipment.

[40] DEIS, p. 2-12.
[41] *See* DEIS App'x J, p. J-21.

By implementing these additional measures that will reduce emissions of VOCs and methane, the project's impacts on air quality and waste prevention will further be reduced. Requiring common-sense, technologically feasible, available mitigation measures is one of the most cost-effective pathways to restore clean, healthy air to people living near the project, as well as those parts of the state affected by the transport of pollutants from the project's oil and gas production, and to reduce the waste of saleable product.

VI. Conclusion

The DEIS demonstrates that EOG's project will worsen the existing air quality problem in the Uintah Basin, and that BLM did not adequately consider alternatives that would have reduced this adverse impact. In addition, BLM failed to adequately consider alternatives that would have prevented the loss of valuable product in derogation of its duties under FLPMA and the MLA. Specifically, BLM failed to adequately evaluate the impact of Alternatives A and D on air quality in the project area, and in particular, on the potential impact on the ability of the Uintah Basin to achieve the ozone NAAQS, and BLM failed to evaluate the impact of Alternatives A and D on waste prevention. Accordingly, BLM must go back and adequately analyze these two alternatives. In addition, we urge BLM to revisit its emission inventory and modeling which likely underestimate the actual emissions associated with the project, and exceedances of the ozone NAAQS, and to require additional available measures to reduce leaks, venting and flaring.

Respectfully submitted,

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Environmental Defense Fund