

1 Jeremy C. Lieb (WSB #47219)
Erik Grafe (AK Bar #0804010) (*pro hac vice* pending)
2 EARTHJUSTICE
441 W 5th Avenue, Suite 301
3 Anchorage, AK 99501
T: 907.277.2500
4 F: 907.277.1390
E: jlieb@earthjustice.org
5 egrafe@earthjustice.org

6 Kristen L. Boyles (WSB #23806)
EARTHJUSTICE
7 705 Second Avenue, Suite 203
Seattle, WA 98104
8 T: 206.343.7340
F: 206.343.1526
9 E: kboyles@earthjustice.org

10 *Attorneys for Citizens for Clean Air, a project of*
11 *Alaska Community Action on Toxics, and Sierra Club*

12 UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF WASHINGTON
13 AT SEATTLE

14 CITIZENS FOR CLEAN AIR, a project of)
ALASKA COMMUNITY ACTION ON TOXICS,)
and SIERRA CLUB,)

15 Plaintiffs,)

16 v.)

17 ANDREW WHEELER, in his official capacity as)
18 Acting Administrator of the United States)
Environmental Protection Agency, and CHRIS)
19 HLADICK, in his official capacity as Regional)
Administrator of the United States Environmental)
20 Protection Agency Region 10,)

21 Defendants.)
22)
23)
24)

25 COMPLAINT
(Case No. 2:18-cv-01803)

Earthjustice
441 W 5th Avenue, Suite 300
Anchorage, AK 99501
907.277.2500

INTRODUCTION

1
2 1. The Fairbanks Northstar Borough (“Fairbanks” or “the Borough”) has the worst
3 fine particulate matter (“PM-2.5”) air pollution in the nation — with levels spiking far in excess
4 of the next most-polluted area and over twice the recommended limit for unhealthy air. Federal
5 Defendants have known about Fairbanks’s harmful PM-2.5 pollution for more than a decade, but
6 they have repeatedly failed to take action mandated by the Clean Air Act to address the problem.
7 Most recently, they failed to make a completeness determination regarding the state of Alaska’s
8 failure to submit a timely proposed state implementation plan (“SIP”) addressing requirements
9 triggered by EPA’s designation of Fairbanks as a 2006 24-hour fine particulate matter “serious”
10 nonattainment area. Due in part to Defendants’ ongoing delay, the people of Fairbanks,
11 including children and the elderly, continue to be endangered by the harms of PM-2.5 exposure.

12 2. The Federal Government recognizes the dangers that PM-2.5 exposure poses to
13 the people of Fairbanks. Under the Clean Air Act, the U.S. Environmental Protection Agency
14 (“EPA”) regulates PM-2.5 pollution, imposing relevant 24-hour National Ambient Air Quality
15 Standards (“NAAQS”). 62 Fed. Reg. 38,652 (July 18, 1997) (adopting 24-hour NAAQS for
16 PM-2.5); 71 Fed. Reg. 61,144 (Oct. 17, 2006) (codified at 40 C.F.R. § 50.13) (strengthening
17 standards).

18 3. EPA designated the Borough a nonattainment area with respect to the 2006 24-
19 hour NAAQS for PM-2.5 in November 2009. 74 Fed. Reg. 58,688, 58,696, 58,702 (Nov. 13,
20 2009).

21 4. Since 2009, EPA has continued to document that the Borough has some of the
22 worst episodic PM-2.5 pollution in the nation, with ambient air concentrations frequently in
23 excess of the NAAQS for PM-2.5—currently by more than any other previously designated
24

1 nonattainment area. *See* Exhibit 1 (EPA, *PM_{2.5} Design Values, 2017* at tbl. 1b (“Areas
2 Previously Designated Nonattainment for the 2006 PM_{2.5} 24-hour NAAQS”) (July 23, 2018)).

3 5. However, EPA has failed in its duties to protect the families of Fairbanks from
4 fine particulate matter pollution. EPA has previously missed three related deadlines in the
5 Borough’s Clean Air Act process, resulting in three previous suits before this Court. *See*
6 *Compl., Citizens for Clean Air v. McCarthy*, No. 2:16-cv-01594-RAJ (W.D. Wash. 2016), ECF
7 No. 1; *Compl., Citizens for Clean Air v. McCarthy*, No. 2:16-cv-00857-JCC (W.D. Wash. 2016),
8 ECF No. 1; *Compl., Citizens for Clean Air v. McCarthy*, No. 2:14-cv-00610-MJP (W.D. Wash.
9 2014), ECF No. 1.

10 6. EPA has missed yet another deadline to enforce the Clean Air Act in Fairbanks.
11 Following EPA’s reclassification of the Borough as a “serious” nonattainment area in May 2017,
12 82 Fed. Reg. 21,711, 21,712 (May 10, 2017), the state of Alaska was required to submit a serious
13 area PM-2.5 SIP no later than December 31, 2017, addressing the more stringent requirements of
14 that designation. 40 C.F.R. § 51.1003(b)(2)(ii). The state of Alaska failed to submit a serious
15 area PM-2.5 SIP. Due to this failure, the Clean Air Act required EPA to make a finding of
16 failure to submit by June 30, 2018. 42 U.S.C. § 7410(k)(1)(B). Such an EPA finding would start
17 the clock on a two-year deadline for Alaska to submit a compliant SIP or for the EPA to prepare
18 a federal plan. 42 U.S.C. § 7410(c)(1). It would also set 18-month and two-year deadlines after
19 which certain sanctions will be imposed if Alaska fails to submit a compliant SIP. 42 U.S.C. §
20 7509. To date, EPA has not made the required finding.

21 7. Accordingly, Plaintiffs CITIZENS FOR CLEAN AIR, a project of ALASKA
22 COMMUNITY ACTION ON TOXICS, and SIERRA CLUB, bring this action to compel
23 Defendant ANDREW WHEELER, in his official capacity as Acting EPA Administrator, and
24

1 Defendant CHRIS HLADICK, in his official capacity as Regional Administrator of EPA Region
2 10, to perform their mandatory duties to ensure that the Federal Government provides the
3 residents of the Borough the protections guaranteed under the Clean Air Act.

4 **JURISDICTION**

5 8. The Court has jurisdiction over this action to compel the performance of EPA's
6 non-discretionary duties under the Clean Air Act's citizen suit provision, 42 U.S.C. § 7604(a),
7 and pursuant to federal question jurisdiction, 28 U.S.C. § 1331. The Court also has authority to
8 order declaratory and injunctive relief pursuant to 28 U.S.C. §§ 2201 and 2202.

9 **NOTICE**

10 9. On October 10, 2018, Plaintiffs provided EPA written notice of the claim stated in
11 this action, as required by 42 U.S.C. § 7604(b)(2). *See* Exhibit 2 (J. Lieb, counsel for Plaintiffs,
12 Letter to Andrew Wheeler, Acting Adm'r of EPA (Oct. 10, 2018)). A period of sixty days has
13 elapsed since EPA was notified of Plaintiffs' claim. *See* 42 U.S.C. § 7604(b)(2).

14 **VENUE**

15 10. Venue is proper in this Court pursuant to 28 U.S.C. § 1391(e). Defendant EPA
16 resides in this judicial district. EPA Region 10, which has authority over Alaska, is
17 headquartered in Seattle, Washington. This civil action is brought against officers of the United
18 States acting in their official capacities, and a substantial part of the events or omissions giving
19 rise to the claims in this case occurred in the Western District of Washington. Further, because
20 EPA Region 10 is located within King County, assignment to the Seattle Division is proper
21 under Civil Local Rule 3(d)(1).

22 **PARTIES**

23 11. Plaintiff CITIZENS FOR CLEAN AIR, a project of ALASKA COMMUNITY
24 ACTION ON TOXICS, is a coalition of local community members and citizens' groups in

1 Fairbanks, Alaska who are committed to cleaning up the air while keeping everyone warm in the
2 winter. The coalition is a project of Alaska Community Action on Toxics, a non-profit
3 environmental health research and advocacy organization whose mission is to assure justice by
4 advocating for environmental and community health.

5 12. Plaintiff SIERRA CLUB is a national nonprofit organization with 67 chapters and
6 over 780,000 members dedicated to exploring, enjoying, and protecting the wild places of the
7 Earth; to practicing and promoting the responsible use of the Earth's ecosystems and resources;
8 to educating and enlisting humanity to protect and restore the quality of the natural and human
9 environment; and to using all lawful means to carry out these objectives. The Alaska Chapter of
10 the Sierra Club has over 1,800 members, including members in the Borough.

11 13. Plaintiffs' members live, raise their families, work, recreate, and conduct
12 educational, advocacy, and other activities in the Borough. They are adversely affected by
13 continuing exposure to levels of PM-2.5 pollution that exceed the national, health-based
14 standards for 24-hour concentrations of PM-2.5 established under the Clean Air Act. The
15 adverse effects of such pollution include actual or threatened harm to their health; their families'
16 health; their professional, educational, and economic interests; and their aesthetic and
17 recreational enjoyment of the environment in the Borough.

18 14. EPA's failure to timely perform the mandatory duties described in this Complaint
19 has injured and continues to injure the interests of Plaintiffs and their members. The relief
20 requested in this lawsuit would redress these injuries by compelling EPA to take the action
21 mandated by Congress in the Clean Air Act's requirements for addressing and improving air
22 quality in areas violating national air quality standards, such as the Borough.

1 15. Defendant ANDREW WHEELER is sued in his official capacity as the Acting
2 Administrator of EPA. He is responsible for taking various actions to implement and enforce the
3 Clean Air Act, including the mandatory duty at issue in this case.

4 16. Defendant CHRIS HLADICK is sued in his official capacity as EPA Regional
5 Administrator for Region 10. He is responsible for implementing and enforcing the Clean Air
6 Act in EPA Region 10, which includes the Borough.

7 **STATUTORY FRAMEWORK**

8 17. Congress enacted the Clean Air Act to “speed up, expand, and intensify the war
9 against air pollution in the United States with a view to assuring that the air we breathe
10 throughout the Nation is wholesome once again.” H.R. Rep. No. 91-1146, at 1 (1970), *reprinted*
11 *in* 1970 U.S.C.C.A.N. 5356, 5356. Consistent with these goals, the Act requires EPA to set
12 NAAQS for certain pollutants, “the attainment and maintenance of which . . . are requisite to
13 protect the public health” with “an adequate margin of safety,” 42 U.S.C. §§ 7409(a)-(b), and to
14 designate areas with air pollution levels that exceed the national standards as “nonattainment”
15 areas, 42 U.S.C. § 7407(d)(1).

16 18. The Clean Air Act requires that a nonattainment area that has been designated as
17 “moderate” must attain the NAAQS “as expeditiously as practicable but no later than the end of
18 the sixth calendar year after the area’s designation as nonattainment.” *See* 42 U.S.C. §
19 7513(c)(1) (stating rule for setting attainment dates for “moderate” PM-10 nonattainment areas);
20 *see also Nat. Res. Def. Council v. EPA*, 706 F.3d 428, 434-36 (D.C. Cir. 2013) (holding that
21 subpart four of the Clean Air Act, addressing PM-10 standards extends to PM-2.5 nonattainment
22 areas).

1 19. The Administrator shall determine whether a “moderate” nonattainment area has
2 attained the NAAQS by its attainment date within six months following that attainment date. 42
3 U.S.C. § 7513(b)(2). If the Administrator determines that the NAAQS was not attained, the area
4 shall be reclassified by operation of law as a “serious” nonattainment area. *Id.* § 7513(b)(2)(A).
5 The Administrator must then publish a notice in the Federal Register no later than six months
6 following the attainment date identifying the area as having failed to attain and giving notice of
7 the area’s reclassification as a “serious” nonattainment area. *Id.* § 7513(b)(2)(B).

8 20. The Clean Air Act requires that a nonattainment area that has been designated as
9 “serious” must attain the NAAQS “as expeditiously as practicable but no later than the end of the
10 tenth calendar year after the area’s designation as nonattainment.” 42 U.S.C. § 7513(c)(2).

11 21. Once a nonattainment area is reclassified as “serious,” “the state(s) shall submit to
12 the EPA a Serious area attainment plan . . . within 18 months from the effective date of
13 reclassification, or 2 years before the attainment date, whichever is earlier.” 40 C.F.R. pt.
14 51.1003(b)(2)(ii).

15 22. The Clean Air Act requires EPA to determine whether any state implementation
16 plan is administratively complete. 42 U.S.C. § 7410(k)(1)(B). EPA must make this
17 determination “no later than 6 months after the date, if any, by which a State is required to
18 submit the plan or revision.” *Id.*

19 23. If a state completely fails to submit a required state implementation plan by the
20 deadline, then there is no submittal that may be deemed administratively complete, and EPA
21 therefore must make a determination—and publish notice of that determination in the Federal
22 Register—stating that the state failed to submit an administratively complete state
23 implementation plan. 42 U.S.C. § 7410(k)(1)(B). Such a determination is referred to as a
24

1 “finding of failure to submit.” *See Sierra Club v. U.S. Env'tl. Prot. Agency*, 671 F.3d 955, 960
2 (9th Cir. 2012).

3 24. Upon issuing a finding of failure to submit, the Clean Air Act establishes a two-
4 year deadline for EPA either to approve a state implementation plan (subsequently submitted by
5 state authorities to address the deficiency) or to promulgate a federal implementation plan. 42
6 U.S.C. § 7410(c)(1). When a state implementation plan is required to address nonattainment of
7 an air quality standard, a finding of failure to submit also starts the clock on mandatory sanctions
8 intended to induce states to develop and submit their plan. More specifically, 18 months after
9 the finding, if the deficiency is not corrected, all proposed new pollution sources within the
10 nonattainment area become subject to a heightened permitting requirement. *Id.* § 7509(a), (b)(2);
11 40 C.F.R. § 52.31(c), (d). Twenty-four (24) months after the finding, if the deficiency still is not
12 corrected, a moratorium on federal highway funds also is imposed, with an exemption for safety
13 and mass transit projects. 42 U.S.C. § 7509(b)(1); 40 C.F.R. § 52.31(d).

14 25. If EPA fails to take a non-discretionary action, such as acting on a state
15 implementation plan submittal or failing to timely issue a “finding of failure to submit,” citizens
16 are empowered to seek a court order to compel prompt action. 42 U.S.C. § 7604(a)(2).

17 STATEMENT OF FACTS

18 26. PM-2.5 refers to fine particles less than or equal to 2.5 micrometers in diameter,
19 including hazardous forms of dirt, soot, smoke, and liquid droplets found in the air. PM-2.5 is
20 “produced chiefly by combustion processes and by atmospheric reactions of various gaseous
21 pollutants,” and “[s]ources of fine particles include . . . motor vehicles, power generation,
22 combustion sources at industrial facilities, and residential fuel burning.” 71 Fed. Reg. at 61,145.

1 27. The detrimental effects of PM-2.5 on human health are significant. Numerous
2 scientific studies have linked particle pollution exposure, especially exposure to fine particles, to
3 a variety of problems, including premature death in people with heart or lung disease, non-fatal
4 heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased
5 respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, as well
6 as possibly cancer, and reproductive and developmental harms. *See* Exhibit 3 at 1 (EPA, *Health*
7 *and Environmental Effects of Particulate Matter (PM)* (Oct. 9, 2018)); Exhibit 4 at 8 (American
8 Lung Association, *State of the Air 2015* (citing EPA, Integrated Science Assessment for
9 Particulate Matter, EPA 600/R-08/139F (Dec. 2009))).

10 28. EPA first adopted 24-hour NAAQS for PM-2.5 in 1997. 62 Fed. Reg. at 38,652.
11 In 2006, EPA strengthened these standards, revising the maximum allowed 24-hour average
12 concentration of PM-2.5 from 65 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to 35 $\mu\text{g}/\text{m}^3$. 71 Fed. Reg.
13 at 61,144, 61,146.

14 29. Fairbanks has some of the worst PM-2.5 pollution in the nation, with ambient air
15 concentrations frequently in excess of the 24-hour NAAQS. Of all previously designated
16 nonattainment areas for 24-hour PM-2.5, measured by 2015-2017 design values, Fairbanks is the
17 most polluted, with pollution levels more than twice federal limits. *See* Exhibit 1.

18 30. On November 13, 2009, EPA designated the Borough as a nonattainment area
19 with respect to 24-hour PM-2.5 NAAQS. 74 Fed. Reg. at 58,696, 58,702.

20 31. At that time, the Borough was a “moderate” nonattainment area. 79 Fed. Reg.
21 31,566, 31,568 (June 2, 2014) (“[T]he EPA in this notice is identifying the classification of all
22 [PM-2.5] areas currently designated nonattainment for the 1997 and 2006 NAAQS as
23 ‘Moderate.’”).

1 32. The Borough’s attainment date for the 24-hour PM-2.5 NAAQS was “no later
2 than the end of the sixth calendar year after the area’s designation as nonattainment,” 42 U.S.C. §
3 7513(c)(1), that is, no later than December 31, 2015. 79 Fed. Reg. at 31,570 (stating that the
4 areas identified as moderate under the rule “are subject to a Moderate area attainment deadline
5 under subpart 4 of no later than December 31, 2015.”); *WildEarth Guardians v. EPA*, 830 F.3d
6 529, 541 (D.C. Cir. 2016) (observing that in EPA’s 2014 implementation rule “the agency
7 retained the attainment deadline of December 31, 2015”).

8 33. The Borough failed to achieve attainment by that date, and EPA failed to publish
9 notice in the Federal Register determining that the Borough failed to attain the NAAQS and
10 reclassifying the area as a “serious” nonattainment area within six months, by June 30, 2016.

11 34. In response to a lawsuit filed by Plaintiffs in this Court, EPA proposed in
12 December 2016 to determine that Fairbanks was still in nonattainment with the 2006 24-hour
13 PM-2.5 standard and to reclassify the Borough as a “serious” nonattainment area. 81 Fed. Reg.
14 91,088, 91,089 (Dec. 16, 2016); *Citizens for Clean Air v. Pruitt*, No. 2:16-cv-01594-RAJ (W.D.
15 Wash. 2016), ECF No. 14.

16 35. EPA finalized its determination and reclassified Fairbanks as a “serious”
17 nonattainment area on May 10, 2017. 82 Fed. Reg. at 21,712.

18 36. As a “serious” nonattainment area, the Borough’s attainment date for the 24-hour
19 PM-2.5 NAAQS is “no later than the end of the tenth calendar year after the area’s designation
20 as nonattainment,” 42 U.S.C. § 7513(c)(2), that is, no later than December 31, 2019. 82 Fed.
21 Reg. at 21,712.

22 37. The state of Alaska was required to submit a proposed serious area PM-2.5 SIP
23 addressing the more stringent requirements of that designation “within 18 months from the
24

1 effective date of reclassification, or 2 years before the attainment date, whichever is earlier,” 40
2 C.F.R. pt. 51.1003(b)(2)(ii). In this case the earlier date is two years before attainment; the
3 State’s plan was due no later than December 31, 2017. 82 Fed. Reg. at 21,712.

4 38. The state of Alaska failed to submit a serious area PM-2.5 SIP by December 31,
5 2017, and still has not submitted a serious area PM-2.5 SIP as of the filing of this complaint.

6 39. EPA was required to make a completeness determination regarding the state of
7 Alaska’s SIP submission, or a finding of failure to submit, within six months of the submission
8 deadline and no later than June 30, 2018. 42 U.S.C. § 7410(k)(1)(B).

9 40. EPA failed to issue the required completeness finding by June 30, 2018, and still
10 has not made this finding as of the filing of this complaint.

11 **CLAIM FOR RELIEF**
12 **(Clean Air Act: Failure to make mandatory finding of failure to submit)**

13 41. Plaintiffs reallege each and every allegation set forth above, as if fully set forth
14 herein.

15 42. The deadline for the state of Alaska to submit a serious area PM-2.5 SIP for the
16 Fairbanks North Star Borough was December 31, 2017.

17 43. The state of Alaska has not submitted a serious area PM-2.5 SIP for the Borough.

18 44. Pursuant to 42 U.S.C. § 7410(k)(1)(B), EPA had a mandatory duty to make a
19 finding of failure to submit within six months of the submission deadline and no later than June
20 30, 2018.

21 45. EPA has failed to perform this mandatory duty.

22 46. Accordingly, EPA has been in continuous violation of the Clean Air Act, 42
23 U.S.C. § 7410(k)(1)(B), since June 30, 2018, or earlier.

1 47. EPA's Clean Air Act violation constitutes a "failure of the Administrator to
2 perform [an] act or duty under [chapter 85] which is not discretionary with the Administrator,"
3 within the meaning of the Clean Air Act's citizen suit provision. 42 U.S.C. § 7604(a)(2). The
4 violation is ongoing.

5 **PRAYER FOR RELIEF**

6 Wherefore, Plaintiffs respectfully request that the Court:

7 48. Declare that the Administrator is in violation of the Clean Air Act with regard to
8 his mandatory, nondiscretionary duty under 42 U.S.C. § 7410(k)(1)(B) to make a finding that the
9 state of Alaska has failed to submit a serious area nonattainment SIP addressing 24-hour
10 concentrations of PM-2.5 in the Fairbanks North Star Borough;

11 49. Issue an injunction requiring the Administrator to make and publish in the Federal
12 Register a finding of failure to submit, as required by law;

13 50. Retain jurisdiction of this matter until such time as EPA has complied with its
14 non-discretionary duties under the Clean Air Act;

15 51. Award to Plaintiffs their reasonable costs of litigation, including attorneys' fees
16 and expert witness fees; and

17 52. Grant such further relief as the Court deems just and proper.

18 Respectfully submitted this 14th day of December, 2018.

19 *s/ Jeremy C. Lieb*

20 Jeremy C. Lieb (WSB #47219)

21 Erik Grafe (AK Bar #0804010) (*pro hac vice* pending)

22 EARTHJUSTICE

23 441 W 5th Avenue, Suite 301

24 Anchorage, AK 99501

T: 907.277.2500

F: 907.277.1390

E: jl Lieb@earthjustice.org

egr afe@earthjustice.org

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Kristen L. Boyles (WSB #23806)
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104
T: 206.343.7340
F: 206.343.1526
E: kboyles@earthjustice.org

*Attorneys for Citizens for Clean Air, a project of Alaska
Community Action on Toxics, and Sierra Club*

TABLE OF EXHIBITS

Exhibit No.	Description
1	U.S. Environmental Protection Agency (EPA), <i>PM2.5 Design Values, 2017</i> (July 23, 2018), https://www.epa.gov/air-trends/air-quality-design-values#report (excerpt)
2	J. Lieb., Earthjustice, Letter to A. Wheeler, EPA, Re. 60-Day Notice of Intent to File Clean Air Act Citizen Suit (Oct. 10, 2018)
3	EPA, <i>Health and Environmental Effects of Particulate Matter (PM)</i> (Oct. 9, 2018)
4	American Lung Association, <i>State of the Air 2015</i> (excerpts)

EXHIBIT 1

Table 1b. Areas Previously Designated Nonattainment for the 2006 PM_{2.5} 24-hour NAAQS

AQS Data Query: 07/20/18; Last updated: 07/23/18

Designated Area (2006 NAAQS)	State	EPA Region	Designation Status ¹	2015-2017 24-hour Design Value (µg/m ³) ^{2,3,4,5}	Met 2006 NAAQS? ^{3,4}	Redesignation Effective Date ^{1,5}	Latest Attainment/Clean Data Determination Date ^{1,5}
Allentown	PA	03	Maintenance	24	yes	04/13/15	
Birmingham	AL	04	Maintenance	22	yes	02/25/13	
Canton-Massillon	OH	05	Maintenance	22	yes	10/22/13	
Charleston	WV	03	Maintenance	17	yes	04/30/14	
Chico	CA	09	Nonattainment	28	yes		06/09/17
Cleveland-Akron-Lorain	OH	05	Maintenance	25	yes	09/18/13	
Detroit-Ann Arbor	MI	05	Maintenance	28	yes	08/29/13	
Fairbanks	AK	10	Nonattainment	85	no		
Harrisburg-Lebanon-Carlisle-York	PA	03	Maintenance	30	yes	12/08/14	
Imperial County	CA	09	Nonattainment	31	yes		06/09/17
Johnstown	PA	03	Maintenance	25	yes	07/15/15	
Klamath Falls	OR	10	Nonattainment	36	no		07/06/16
Knoxville-Sevierville-La Follette	TN	04	Maintenance	34	yes	09/27/17	06/09/17
Lancaster	PA	03	Maintenance	28	yes	07/16/15	
Liberty-Clairton	PA	03	Nonattainment	37	no		06/09/17
Logan	UT-ID	08,10	Nonattainment	33	yes		
Los Angeles-South Coast Air Basin	CA	09	Nonattainment	39	no		
Milwaukee-Racine	WI	05	Maintenance	22	yes	04/22/14	
New York-N. New Jersey-Long Island	NY-NJ-CT	01,02	Maintenance	23	yes	04/18/14	
Nogales	AZ	09	Nonattainment	28	yes		06/09/17
Oakridge	OR	10	Nonattainment	46	no		03/12/18
Philadelphia-Wilmington	PA-NJ-DE	02,03	Maintenance	25	yes	04/21/15	
Pittsburgh-Beaver Valley	PA	03	Maintenance	24	yes	10/02/15	
Provo	UT	08	Nonattainment	31	yes		
Sacramento	CA	09	Nonattainment	34	yes		06/09/17
Salt Lake City	UT	08	Nonattainment	37	no		
San Francisco Bay Area	CA	09	Nonattainment	35	yes		06/09/17
San Joaquin Valley ⁶	CA	09	Nonattainment	72	no		
Steubenville-Weirton	OH-WV	03,05	Maintenance	25	yes	04/17/14	
Tacoma	WA	10	Maintenance	31	yes	03/12/15	
West Central Pinal	AZ	09	Nonattainment	32	yes		10/04/13
Yuba City-Marysville	CA	09	Maintenance	28	yes	01/08/15	

Notes:

- Area Designation Status and Redesignation/Clean Data Determination dates as of 05/08/18. The dates shown in Column G represent the redesignation effective date for those areas that have been redesignated from nonattainment to maintenance.
- The level of the 2006 24-hour NAAQS for PM_{2.5} is 35 micrograms per cubic meter (µg/m³). The design value for the 24-hour PM_{2.5} NAAQS is the 3-year average 98th percentile concentration.
- The design values shown here are computed for the latest design value period using Federal Reference Method or equivalent data reported by States, Tribes, and local agencies to EPA's Air Quality System (AQS) as of 05/08/18. Concentrations flagged by States, Tribes, and local agencies as exceptional events (e.g., high winds, wildfires, volcanic eruptions, construction) and concurred by the associated EPA Regional Office are not included in the calculation of these design values. Data from special purpose monitors operating less than 24 month, data identified as non-regulatory and other data judged by EPA as not meeting 40CFR58 monitoring requirements are not included in these design value calculations.
- In this table, the 24-hour design values (column E), and their associated validities and met NAAQS entries (column F) are determined according to the protocols specified in the 2012 revised appendix N.
- For multi-state nonattainment areas, the date provided is the date of the last action that EPA took to redesignate or determine attainment for any portion of the area (such actions are taken on a state-by-state basis, not on an area-wide basis). Dates for earlier actions on other portions of each multi-state area are available in the Green Book -- <http://www.epa.gov/airquality/greenbook/index.html>
- San Joaquin Valley's 2015-2017 design value site (Corcoran-Patterson) is based on concentration data from January 1, 2015 to February 6, 2015 and from January 1, 2016 to December 31, 2017; data from February 7, 2015 to December 31, 2015 are not available due to a fire that destroyed the site. Based on design value calculation methodologies described in 40 CFR 50, Appendix N the design value for Corcoran-Patterson is considered valid despite the missing 2015 data. The second highest 2015-2017 concentration (24-hour PM_{2.5} DV of 59) that includes data measured for three complete years (January 1, 2015 - December 31, 2017) is at Bakersfield-Planz.

Disclaimer: The information listed in this report and in these tables is intended for informational use only and does not constitute a regulatory determination by EPA as whether an area has attained a NAAQS. The information set forth in this report has no regulatory effect. To have regulatory effect, a final EPA determination as to whether an area has attained a NAAQS or attained a NAAQS as of its applicable attainment date can be accomplished only after rulemaking that provides an opportunity for notice and comment. No such determination for regulatory purposes exists in the absence of such rulemaking. This report does not constitute a proposed or final rulemaking.

EXHIBIT 2



October 10, 2018

Via Certified and Electronic Mail, Return Receipt Requested

The Hon. Andrew Wheeler
Acting Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
E: wheeler.andrew@epa.gov

Re: 60-Day Notice of Intent to File Clean Air Act Citizen Suit

Dear Acting Administrator Wheeler:

Pursuant to 42 U.S.C. § 7604(b)(2) and 40 C.F.R. Part 54, we hereby give notice of intent to commence a civil action against the Administrator of the U.S. Environmental Protection Agency (“Administrator,” “EPA,” or “you”) for failing to perform a nondiscretionary duty under the Clean Air Act (the “Act”). As further specified below, you have failed to carry out your nondiscretionary duty under Section 110(k)(1) of the Act.¹ You have yet to make a completeness determination regarding the state of Alaska’s failure to timely submit a proposed state implementation plan (“SIP”) addressing requirements newly triggered by EPA’s designation of the Fairbanks North Star Borough (“Fairbanks” or the “Borough”) as a 2006 24-hour fine particulate matter “Serious” nonattainment area.

Inhalable airborne particles present serious air quality problems in many areas of the United States. Numerous scientific studies have linked particle pollution exposure, especially exposure to fine particles (those that are 2.5 micrometers in diameter or smaller, hereinafter “PM_{2.5}”), to a variety of problems, including premature death, heart attacks, aggravated asthma, and other respiratory issues.² EPA has also concluded that PM_{2.5} pollution may cause cancer and developmental and reproductive harm.³

¹ 42 U.S.C. § 7410(k)(1)(B).

² See EPA, *Integrated Science Assessment for Particulate Matter (Final Report)* 6:1-7:114 (Dec. 2009); EPA, *Health and Environmental Effects of Particulate Matter (PM)*, <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm> (last visited Oct. 9, 2018).

³ American Lung Association, *Particle Pollution*, <http://www.lung.org/our-initiatives/healthy-air/outdoor/air-pollution/particle-pollution.html> (last visited Oct. 9, 2018) (citing EPA, *Integrated Science Assessment for Particulate Matter (Final Report)* (Dec. 2009)).

Of all designated nonattainment areas for PM_{2.5}, as measured by their 2015-2017 design values, Fairbanks has the worst episodic pollution, with pollution levels more than twice federal limits.⁴ The entire history of Alaska and Fairbanks's noncompliance with federal air quality standards spans over two decades. Although Fairbanks has some of the worst air pollution in the country—with occasional air-quality readings “twice as bad as Beijing’s”⁵—EPA and the state of Alaska have failed to meet their basic obligations under the Clean Air Act. Our clients have filed three lawsuits in the last four years to enforce the mandatory deadlines set forth by law. We are now prepared to bring a fourth.

The actions and deadlines directly relevant to this notice letter follow below:

In 1997, EPA established a 24-hour National Ambient Air Quality Standard (NAAQS) for PM_{2.5}⁶ and made these standards more stringent in 2006.⁷ On November 13, 2009, EPA identified Fairbanks as a “nonattainment area” for the revised 2006 standard, which became effective in December 14, 2009.⁸ EPA later promulgated a rule in 2014 acknowledging that Fairbanks had been a “Moderate” nonattainment area “by operation of law” since the date of the Borough’s nonattainment designation in December 2009.⁹ Fairbanks’s deadline as a “Moderate”

⁴ EPA, *PM_{2.5} Design Values, 2017* at tbl. 1b (“24hr Std NAA Status”) (July 24, 2018), <https://www.epa.gov/air-trends/air-quality-design-values> (containing data for nonattainment areas of the 2006 24-hour PM_{2.5} National Ambient Air Quality Standard (“NAAQS”)).

⁵ Kim Murphy, *Fairbanks Area, Trying to Stay Warm, Chokes on Wood Stove Pollution*, L.A. Times (Feb. 16, 2013), <http://articles.latimes.com/2013/feb/16/nation/la-na-fairbanks-air-pollution-20130217>.

⁶ 62 Fed. Reg. 38,652 (July 18, 1997).

⁷ 71 Fed. Reg. 61,144 (Oct. 17, 2006) (codified at 40 C.F.R. pt. 50.13).

⁸ 74 Fed. Reg. 58,688, 58,696, 58,702 (Nov. 13, 2009).

⁹ 79 Fed. Reg. 31,566, 31,567 (June 2, 2014); 42 U.S.C. § 7513(a) (“Every area designated nonattainment for PM₁₀ . . . shall be classified at the time of such designation, by operation of law, as a moderate PM₁₀ non-attainment area.”); *see also Natural Res. Def. Council v. EPA*, 706 F.3d 428, 434-37 (D.C. Cir. 2013) (Because PM_{2.5} pollution is a subset of PM₁₀ pollution, the Clean Air Act’s regulatory requirements for PM₁₀ apply to PM_{2.5}).

nonattainment area to meet the 2006 24-hour standard for PM_{2.5} was December 31, 2015.¹⁰ The deadline expired without the Borough reaching the standard.

Pursuant to the requirements of the Clean Air Act,¹¹ EPA proposed in December 2016 to determine that Fairbanks was still in nonattainment with the 2006 24-hour PM_{2.5} standard and to reclassify the Borough as a “Serious” nonattainment area.¹² The EPA finalized this determination in May 2017.¹³ In light of Fairbanks’s “Serious” nonattainment designation, Alaska was required to submit a new proposed SIP no later than December 31, 2017, addressing the more stringent requirements of that designation.¹⁴ EPA, in turn, was required to make a completeness determination regarding Alaska’s SIP submission (or failure to submit) by June 30, 2018.¹⁵

¹⁰ 42 U.S.C. § 7513(c)(1) (“[T]he attainment dates for [Moderate] PM-10 nonattainment areas shall be . . . no later than the end of the sixth calendar year after the area's designation as nonattainment [here, December 14, 2009].”); *see also* 79 Fed. Reg. at 31,570 (Areas identified as Moderate under the rule “are subject to a Moderate area attainment deadline under subpart 4 [of Section 188 of the Clean Air Act] of no later than December 31, 2015.”).

¹¹ 42 U.S.C. § 7513(b)(2) (“Within 6 months following the applicable attainment date for a PM-10 area, the Administrator shall determine whether the area attained the standard by that date. If the Administrator finds that any Moderate Area is not in attainment after the applicable attainment date . . . the area shall be reclassified by operation of law as a Serious Area.”); *see also WildEarth Guardians v. EPA*, 830 F.3d 529, 532 (D.C. Cir. 2016) (citing 42 U.S.C. § 7513(b)(2)(A)) (“Should an area fail to attain the requisite standard by the moderate-area attainment date, it is ‘reclassified by operation of law as a serious area.’”).

¹² 81 Fed. Reg. 91,088, 91,089 (Dec. 16, 2016).

¹³ 82 Fed. Reg. 21,711, 21,712 (May 10, 2017).

¹⁴ 40 C.F.R. pt. 51.1003(b)(2)(ii). In one preliminary draft document, Alaska states that its SIP is not due until 18 months after the effective date of EPA’s reclassification, in December 2018. *See* Alaska Dep’t of Env’tl. Conservation, Preliminary Draft Fairbanks Serious Area SIP 24-hour PM-2.5 Technical Analysis Protocol 1 (Mar. 22, 2018). This is incorrect. “For any nonattainment area reclassified to Serious . . . , the state(s) shall submit to the EPA a Serious area attainment plan . . . within 18 months from the effective date of reclassification, or 2 years before the attainment date, *whichever is earlier*.” 40 C.F.R. pt. 51.1003(b)(2)(ii) (emphasis added). As EPA explicitly found in its May 2017 determination, the Borough’s “attainment date” is December 31, 2019; the serious area attainment plan was therefore due two years before that date, on December 31, 2017. 82 Fed. Reg. at 21,712; *see also id.* (EPA concluding that “Serious area attainment plan submissions for the areas reclassified in this action [including Fairbanks] will be due by December 31, 2017.”).

¹⁵ 42 U.S.C. § 7410(k)(1)(B) (“[N]o later than 6 months after the date, if any, by which a State is required to submit the plan or revision, the Administrator shall” make a completeness determination.).

Both deadlines have come and gone. Alaska has not submitted a new proposed SIP, and EPA has not made a completeness determination as required by law. The EPA has therefore been in violation of Section 110(k) of the Clean Air Act since June 30, 2018.

The parties listed below intend to commence a civil action to enforce your nondiscretionary duty to issue a completeness determination regarding Alaska's failure to submit a new proposed SIP unless EPA fully performs this duty within 60 days of the postmark date of this letter. As required under 40 C.F.R. § 54.3(a), this notice letter is submitted on behalf of the following organizations:

Citizens for Clean Air, a project of Alaska Community Action on Toxics
505 West Northern Lights Blvd., Suite 205
Anchorage, AK 99503
T: (907) 222-7714

Sierra Club
2101 Webster Street, Suite 1300
Oakland, CA 94612
T: (415) 977-5500

Citizens for Clean Air is a coalition of local community members and citizen groups in Fairbanks, Alaska committed to cleaning up the air while keeping everyone warm in the winter. The coalition is a project of Alaska Community Action on Toxics, a non-profit environmental health research and advocacy organization whose mission is to assure justice by advocating for environmental and community health.

The Sierra Club is America's largest and most influential grassroots environmental organization, with more than 64 chapters and 3.5 million members and supporters nationwide, including members in Fairbanks, Alaska.

I am legal counsel for the above-named organizations in this matter. Please feel free to contact me to discuss further the basis for this claim, or to explore possible options for resolving this claim short of litigation. Any communications should be addressed to me using the contact information below.

Sincerely,



Jeremy C. Lieb
EARTHJUSTICE
441 West Fifth Avenue, Suite 301
Anchorage, AK 99501
T: 907-792-7104
E: jlieb@earthjustice.org

cc via First Class Mail:

Chris Hladick, Regional Administrator
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Mail Code: RA-210
Seattle, Washington 98101

cc via Certified Mail:

Denise Koch, Director
Division of Air Quality, Alaska Department of Environmental Conservation
410 Willoughby Avenue
P.O. Box 111800
Juneau, Alaska 99811

cc via First Class U.S. Mail:

Governor Bill Walker
State of Alaska
Office of the Governor
P.O. Box 110001
Juneau, Alaska 99811-0001

SENDER: COMPLETE THIS SECTION	COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"> ■ Complete items 1, 2, and 3. ■ Print your name and address on the reverse so that we can return the card to you. ■ Attach this card to the back of the mailpiece, or on the front if space permits. 	A. Signature <input type="checkbox"/> Agent <input type="checkbox"/> Addressee X	
The Hon. Andrew Wheeler Acting Administrator U.S. Environmental Protection Agency 1200 Pennsylvania Avenue, NW Washington, D.C. 20460	B. Received by (Printed Name)	C. Date of Delivery
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PS Form 3800, July 2015 PSN 7530-02-000-9053		Domestic Return Receipt

OCT 16 2018

EXHIBIT 3

An official website of the United States government.

We've made some changes to EPA.gov. If the information you are looking for is not here, you may be able to find it on the EPA Web Archive or the January 19, 2017 Web Snapshot.

Close



Health and Environmental Effects of Particulate Matter (PM)

Health Effects

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream.

Exposure to such particles can affect both your lungs and your heart. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- premature death in people with heart or lung disease
- nonfatal heart attacks
- irregular heartbeat
- aggravated [asthma](#)
- decreased lung function
- increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing.

People with heart or lung diseases, children, and older adults are the most likely to be affected by particle pollution exposure.

- [AirNow](#) can help you monitor air quality near you, and protect yourself and your family from elevated PM levels.

Environmental Effects

Visibility impairment

Fine particles (PM_{2.5}) are the main cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas. [Learn more about visibility and haze](#)

Environmental damage

Particles can be carried over long distances by wind and then settle on ground or water. Depending on their chemical composition, the effects of this settling may include:

- making lakes and streams acidic

- changing the nutrient balance in coastal waters and large river basins
- depleting the nutrients in soil
- damaging sensitive forests and farm crops
- affecting the diversity of ecosystems
- contributing to [acid rain effects](#).

Materials damage

PM can stain and damage stone and other materials, including culturally important objects such as statues and monuments. Some of these effects are related to [acid rain effects on materials](#).

Further Reading

[Particle Pollution and Your Health \(PDF\)](#) (2 pp, 320 K, [About PDF](#)): Learn who is at risk from exposure to particle pollution, what health effects you may experience as a result of particle exposure, and simple measures you can take to reduce your risk.

[How Smoke From Fires Can Affect Your Health](#): It is important to limit your exposure to smoke -- especially if you may be susceptible.

[EPA research on airborne particulate matter](#): EPA supports research that provides the critical science on PM and other air pollutants to develop and implement Clean Air Act regulations that protect the quality of the air we breathe.

LAST UPDATED ON JUNE 20, 2018

EXHIBIT 4



STATE OF THE AIR 2015





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Two types of air pollution dominate in the U.S.: ozone and particle pollution.¹ These two pollutants threaten the health and the lives of millions of Americans. Thanks to the Clean Air Act, the U.S. has far less of both pollutants now than in the past. Still, more than 138.5 million people live in counties where monitors show unhealthy levels of one or both—meaning the air a family breathes could shorten life or cause lung cancer.

So what are ozone and particle pollution?

Ozone Pollution

It may be hard to imagine that pollution could be invisible, but ozone is. The most widespread pollutant in the U.S. is also one of the most dangerous.

Scientists have studied the effects of ozone on health for decades. Hundreds of research studies have confirmed that ozone harms people at levels currently found in the United States. In the last few years, we've learned that it can also be deadly.

What Is Ozone?

Ozone (O₃) is a gas molecule composed of three oxygen atoms. Often called “smog,” ozone is harmful to breathe. Ozone aggressively attacks lung tissue by reacting chemically with it.

The ozone layer found high in the upper atmosphere (the stratosphere) shields us from much of the sun's ultraviolet radiation. However, ozone air pollution at ground level where we can breathe it (in the troposphere) causes serious health problems.

Where Does Ozone Come From?

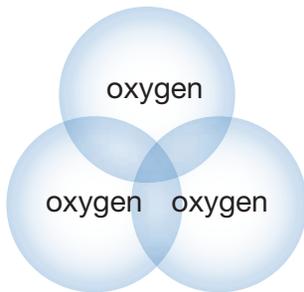
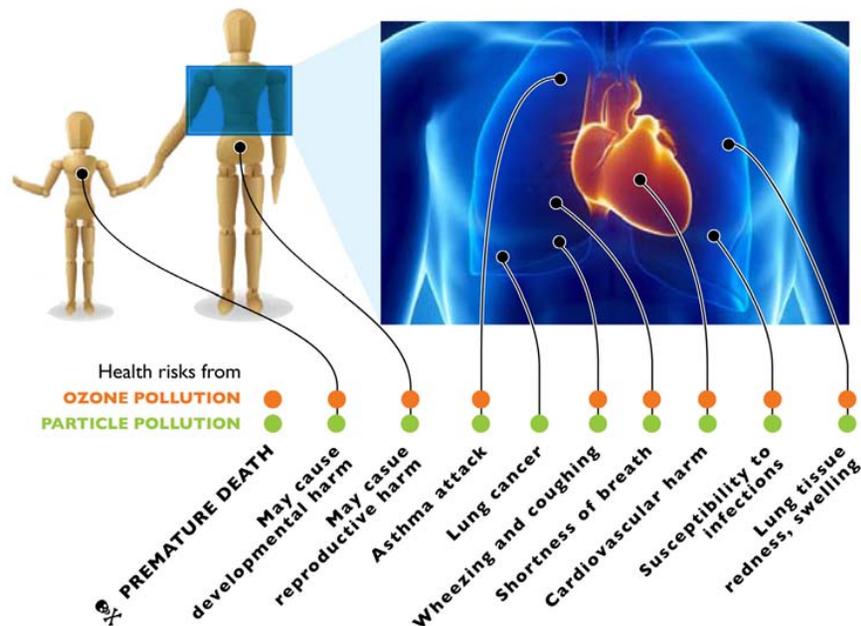
Ozone develops in the atmosphere from gases that come out of tailpipes, smokestacks and

many other sources. When these gases come in contact with sunlight, they react and form ozone smog.

The essential raw ingredients for ozone come from nitrogen oxides (NO_x), hydrocarbons, also called volatile organic compounds (VOCs) and carbon monoxide (CO). They are produced primarily when fossil fuels like gasoline, oil or coal are burned or when some chemicals, like solvents, evaporate. NO_x is emitted from power plants, motor vehicles and other sources of high-heat combustion. VOCs are emitted from motor vehicles, chemical plants, refineries, factories, gas stations, paint and other sources. CO is also primarily emitted from motor vehicles.²

If the ingredients are present under the right conditions, they

Air pollution remains a major danger to the health of children and adults.



react to form ozone. And because the reaction takes place in the atmosphere, the ozone often shows up downwind of the sources of the original gases. In addition, winds can carry ozone far from where it began.



You may have wondered why “ozone action day” warnings are sometimes followed by recommendations to avoid activities such as mowing your lawn or driving your car. Lawn mower exhaust and gasoline vapors are VOCs that could turn into ozone in the heat and sun.

Who is at risk from breathing ozone?

Anyone who spends time outdoors where ozone pollution levels are high may be at risk. Five groups of people are especially vulnerable to the effects of breathing ozone:

- children and teens³;
- anyone 65 and older⁴;
- people who work or exercise outdoors⁵;
- people with existing lung diseases, such as asthma and chronic obstructive pulmonary disease (also known as COPD, which includes emphysema and chronic bronchitis)⁶; and
- people with cardiovascular disease.⁷

In addition, some evidence suggests that other groups—including women, people who suffer from obesity and people with low incomes—may also face higher risk from ozone.⁸ More research is needed to confirm these findings.

The impact on your health can depend on many factors, however. For example, the risks would be greater if ozone levels are higher, if you are breathing faster because you’re working outdoors or if you spend more time outdoors.

Lifeguards in Galveston, Texas, provided evidence of the impact of even short-term exposure to ozone on healthy, active adults in a study published in 2008. Testing the breathing capacity of these outdoor workers several times a day, researchers found that many

lifeguards had greater obstruction in their airways when ozone levels were high. Because of this research, Galveston became the first city in the nation to install an air quality warning flag system on the beach.⁹

How Ozone Pollution Harms Your Health

Premature death. Breathing ozone can shorten your life. Strong evidence exists of the deadly impact of ozone in large studies conducted in cities across the U.S., in Europe and in Asia. Researchers repeatedly found that the risk of premature death increased with higher levels of ozone.¹⁰ Newer research has confirmed that ozone increased the risk of premature death even when other pollutants also exist.¹¹

Even low levels of ozone may be deadly. A large study of 48 U.S. cities looked at the association between ozone and all-cause mortality during the summer months. Ozone concentrations by city in the summer months ranged from 16 percent to 80 percent lower than the U.S. Environmental Protection Agency (EPA) currently considers safe. Researchers found that ozone at those lower levels was associated with deaths from cardiovascular disease, strokes, and respiratory causes.¹²

Immediate breathing problems. Many areas in the United States produce enough ozone during the summer months to cause health problems that can be felt right away. Immediate problems—in addition to increased risk of premature death—include:

- shortness of breath, wheezing and coughing;
- asthma attacks;
- increased risk of respiratory infections;
- increased susceptibility to pulmonary inflammation; and
- increased need for people with lung diseases, like asthma or chronic obstructive pulmonary disease (COPD), to receive medical treatment and to go to the hospital.¹³

Cardiovascular effects. Inhaling ozone may affect the heart as well as the lungs. A 2006 study linked exposures to high ozone levels for as little as one hour to a particular type of cardiac arrhythmia that itself increases the risk of premature death and stroke.¹⁴ A French study found that exposure to elevated ozone levels for one to two days increased the risk of heart attacks for middle-aged

adults without heart disease.¹⁵ Several studies around the world have found increased risk of hospital admissions or emergency department visits for cardiovascular disease.¹⁶

Long-term exposure risks. New studies warn of serious effects from breathing ozone over longer periods. With more long-term data, scientists are finding that long-term exposure—that is, for periods longer than eight hours, including days, months or years—may increase the risk of early death.

- Examining the records from a long-term national database, researchers found a higher risk of death from respiratory diseases associated with increases in ozone.¹⁷
- New York researchers looking at hospital records for children's asthma found that the risk of admission to hospitals for asthma increased with chronic exposure to ozone. Younger children and children from low income families were more likely than other children to need hospital admissions even during the same time periods.¹⁸
- California researchers analyzing data from their long-term Southern California Children's Health Study found that some children with certain genes were more likely to develop asthma as adolescents in response to the variations in ozone levels in their communities.¹⁹
- Studies link lower birth weight and decreased lung function in newborns to ozone levels in their community.²⁰ This research provides increasing evidence that ozone may harm newborns.

Breathing other pollutants in the air may make your lungs more responsive to ozone—and breathing ozone may increase your body's response to other pollutants. For example, research warns that breathing sulfur dioxide and nitrogen oxide—two pollutants common in the eastern U.S.—can make the lungs react more strongly than to just breathing ozone alone. Breathing ozone may also increase the response to allergens in people with allergies. A large study published in 2009 found that children were more likely to suffer from hay fever and respiratory allergies when ozone and PM_{2.5} levels were high.²¹

EPA finds ozone causes harm. The EPA released their most recent review of the current research on ozone pollution in February

2013.²² The EPA had engaged a panel of expert scientists, the Clean Air Scientific Advisory Committee, to help them assess the evidence; in particular, they examined research published between 2006 and 2012. The EPA concluded that ozone pollution posed multiple, serious threats to health. Their findings are highlighted in the box below.

EPA Concludes Ozone Pollution Poses Serious Health Threats

- Causes respiratory harm (e.g. worsened asthma, worsened COPD, inflammation)
- Likely to cause early death (both short-term and long-term exposure)
- Likely to cause cardiovascular harm (e.g. heart attacks, strokes, heart disease, congestive heart failure)
- May cause harm to the central nervous system
- May cause reproductive and developmental harm

—U.S. Environmental Protection Agency, *Integrated Science Assessment for Ozone and Related Photochemical Oxidants*, 2013. EPA/600/R-10/076F.

Particle Pollution

Ever look at dirty truck exhaust?

The dirty, smoky part of that stream of exhaust is made of particle pollution.

Overwhelming evidence shows that particle pollution—like that coming from that exhaust smoke—can kill. Particle pollution can increase the risk of heart disease, lung cancer and asthma attacks and can interfere with the growth and work of the lungs.

What Is Particle Pollution?

Particle pollution refers to a mix of very tiny solid and liquid particles that are in the air we breathe. But nothing about particle pollution is simple. And it is so dangerous it can shorten your life.

Size matters. Particles themselves are different sizes. Some are one-tenth the diameter of a strand of hair. Many are even tinier; some are so small they can only be seen with an electron microscope. Because of their size, you can't see the individual particles. You can only see the haze that forms when millions of particles blur the spread of sunlight.

The differences in size make a big difference in how they affect us. Our natural defenses help us to cough or sneeze larger particles out of our bodies. But those defenses don't keep out smaller particles, those that are smaller than 10 microns (or micrometers) in diameter, or about one-seventh the diameter of a single human hair. These particles get trapped in the lungs, while the smallest are so minute that they can pass through the lungs into the bloodstream, just like the essential oxygen molecules we need to survive.

Researchers categorize particles according to size, grouping them as coarse, fine and ultrafine. Coarse particles fall between 2.5 microns and 10 microns in diameter and are called $PM_{10-2.5}$. Fine particles are 2.5 microns in diameter or smaller and are called $PM_{2.5}$. Ultrafine particles are smaller than 0.1 micron in diameter²³ and are small enough to pass through the lung tissue into the blood stream, circulating like the oxygen molecules themselves. No matter what the size, particles can harm your health.

"A mixture of mixtures." Because particles are formed in so many different ways, they can be composed of many different com-

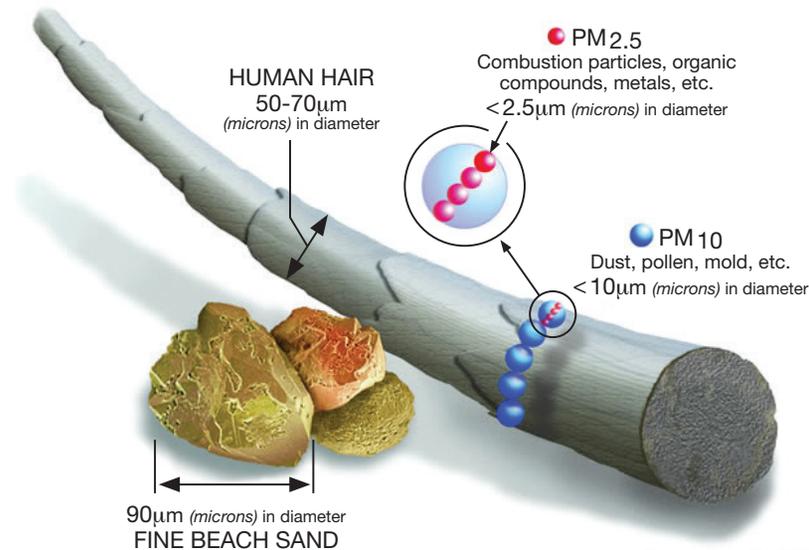


Image courtesy of the U.S. EPA

pounds. Although we often think of particles as solids, not all are. Some are completely liquid; some are solids suspended in liquids. As the EPA puts it, particles are really "a mixture of mixtures."²⁴

The mixtures differ between the eastern and western United States and in different times of the year. For example, the Midwest, South-east and Northeast states have more sulfate particles than the West on average, largely due to the high levels of sulfur dioxide emitted by large, coal-fired power plants. By contrast, nitrate particles from motor vehicle exhaust form a larger proportion of the unhealthy mix in the winter in the Northeast, Southern California, the Northwest, and North Central U.S.²⁵

Who Is at Risk?

Anyone who lives where particle pollution levels are high is at risk. Some people face higher risk, however. People at the greatest risk from particle pollution exposure include:

- Infants, children and teens²⁶;
- People over 65 years of age²⁷;
- People with lung disease such as asthma and chronic obstructive pulmonary disease (COPD), which includes chronic bronchitis and emphysema;
- People with heart disease²⁸ or diabetes²⁹;
- People with low incomes³⁰; and
- People who work or are active outdoors.³¹

Diabetics face increased risk at least in part because of their higher risk for cardiovascular disease.³² A 2010 study examined prevalence of diagnosed diabetes in relation to fine particle pollution in 2004-2005. The evidence suggested that air pollution is a risk factor for diabetes.³³

What Can Particles Do to Your Health?

Particle pollution can be very dangerous to breathe. Breathing particle pollution may trigger illness, hospitalization and premature death, risks that are showing up in new studies that validate earlier research.

Thanks to steps taken to reduce particle pollution, good news is growing from researchers who study the drop in year-round levels of particle pollution.

- Looking at air quality in 545 counties in the U.S. between 2000 and 2007, researchers found that people had approximately four months added to their life expectancy on average due to cleaner air. Women and people who lived in urban and densely populated counties benefited the most.³⁴
- Another long-term study of six U.S. cities tracked from 1974 to 2009 added more evidence of the benefits. Their findings suggest that cleaning up particle pollution had almost immediate health benefits. They estimated that the U.S. could prevent approximately 34,000 premature deaths a year if the nation could lower annual levels of particle pollution by 1 $\mu\text{g}/\text{m}^3$.³⁵

These studies add to the growing research that cleaning up air pollution improves life and health.³⁶ Other researchers estimated that reductions in air pollution can be expected to produce rapid improvements in public health, with fewer deaths occurring within the first two years after reductions.³⁷

Researchers are exploring possible differences in health effects of the three sizes of particles and particles from different sources, such as diesel particles from trucks and buses or sulfates from coal-fired power plants. So far, the evidence remains clear that particles of all sizes from all sources can be dangerous.³⁸

Short-Term Exposure Can Be Deadly

First and foremost, short-term exposure to particle pollution can kill. Peaks or spikes in particle pollution can last for hours to days. Deaths can occur on the very day that particle levels are high, or within one to two months afterward. Particle pollution does not just make people die a few days earlier than they might otherwise—these are deaths that would not have occurred if the air were cleaner.³⁹

Particle pollution also diminishes lung function, causes greater use of asthma medications and increased rates of school absenteeism, emergency room visits and hospital admissions. Other adverse effects can be coughing, wheezing, cardiac arrhythmias and heart attacks. According to the findings from some of the latest studies, short-term increases in particle pollution have been linked to:

- death from respiratory and cardiovascular causes, including strokes^{40,41,42,43};

- increased mortality in infants and young children⁴⁴;
- increased numbers of heart attacks, especially among the elderly and in people with heart conditions⁴⁵;
- inflammation of lung tissue in young, healthy adults⁴⁶;
- increased hospitalization for cardiovascular disease, including strokes and congestive heart failure^{47,48,49};
- increased emergency room visits for patients suffering from acute respiratory ailments⁵⁰;
- increased hospitalization for asthma among children^{51,52,53}; and
- increased severity of asthma attacks in children.⁵⁴

Again, the impact of even short-term exposure to particle pollution on healthy adults showed up in the Galveston lifeguard study. In addition to the harmful effects of ozone pollution, lifeguards had reduced lung volume at the end of the day when fine particle levels were high.⁵⁵

Year-Round Exposure

Breathing high levels of particle pollution day in and day out also can be deadly, as landmark studies in the 1990s conclusively showed⁵⁶ and as other studies confirmed.⁵⁷ Chronic exposure to particle pollution can shorten life by one to three years.⁵⁸

In late 2013, the International Agency for Research on Cancer, part of the World Health Organization, concluded that particle pollution could cause lung cancer. The IARC reviewed the most recent research and reported that the risk of lung cancer increases as the particle levels rise.⁵⁹

Year-round exposure to particle pollution has also been linked to:

- increased hospitalization for asthma attacks for children living near roads with heavy truck or trailer traffic^{60,61};
- slowed lung function growth in children and teenagers^{62,63};
- significant damage to the small airways of the lungs⁶⁴;
- increased risk of death from cardiovascular disease⁶⁵; and
- increased risk of lower birth weight and infant mortality.⁶⁶

Research into the health risks of 65,000 women over age 50 found that those who lived in areas with higher levels of particle pollution faced a much greater risk of dying from heart disease than had been previously estimated. Even women who lived

within the same city faced differing risks depending on the annual levels of pollution in their neighborhood.⁶⁷

The EPA completed their most recent review of the current research on particle pollution in December 2009.⁶⁸ The EPA had engaged a panel of expert scientists, the Clean Air Scientific Advisory Committee, to help them assess the evidence. The EPA concluded that particle pollution caused multiple, serious threats to health. Their findings are highlighted in the box below.

EPA Concludes Fine Particle Pollution Poses Serious Health Threats

- Causes early death (both short-term and long-term exposure)
- Causes cardiovascular harm (e.g. heart attacks, strokes, heart disease, congestive heart failure)
- Likely to cause respiratory harm (e.g. worsened asthma, worsened COPD, inflammation)
- May cause cancer
- May cause reproductive and developmental harm

—U.S. Environmental Protection Agency, Integrated Science Assessment for Particulate Matter, December 2009. EPA 600/R-08/139F.

Where Does Particle Pollution Come From?

Particle pollution is produced through two separate processes—mechanical and chemical.

Mechanical processes break down bigger bits into smaller bits with the material remaining essentially the same, only becoming smaller. Mechanical processes primarily create coarse particles.⁶⁹ Dust storms, construction and demolition, mining operations, and agriculture are among the activities that produce coarse particles. Tire, brake pad and road wear can also create coarse particles. Bacteria, pollen, mold, and plant and animal debris are also included as coarse particles.⁷⁰

By contrast, chemical processes in the atmosphere create most of the tiniest fine and ultrafine particles. Combustion sources burn fuels and emit gases. These gases can vaporize and then condense to become a particle of the same chemical compound. Or, they can react with other gases or particles in the atmosphere to form a particle of a different chemical compound. Particles formed by

this latter process come from the reaction of elemental carbon (soot), heavy metals, sulfur dioxide (SO₂), nitrogen oxides (NO_x) and volatile organic compounds with water and other compounds in the atmosphere.⁷¹ Burning fossil fuels in factories, power plants, steel mills, smelters, diesel- and gasoline-powered motor vehicles (cars and trucks) and equipment generate a large part of the raw materials for fine particles. So does burning wood in residential fireplaces and wood stoves or burning agricultural fields or forests.

Focusing on Children's Health

Children face special risks from air pollution because their lungs are growing and because they are so active.

Just like the arms and legs, the largest portion of a child's lungs will grow long after he or she is born. Eighty percent of their tiny air sacs develop after birth. Those sacs, called the alveoli, are where the life-sustaining transfer of oxygen to the blood takes place. The lungs and their alveoli aren't fully grown until children become adults.⁷² In addition, the body's defenses that help adults fight off infections are still developing in young bodies.⁷³ Children have more respiratory infections than adults, which also seems to increase their susceptibility to air pollution.⁷⁴

Furthermore, children don't behave like adults, and their behavior also affects their vulnerability. They are outside for longer periods and are usually more active when outdoors. Consequently, they inhale more polluted outdoor air than adults typically do.⁷⁵

Air Pollution Increases Risk of Underdeveloped Lungs

The Southern California Children's Health study looked at the long-term effects of particle pollution on teenagers. Tracking 1,759 children who were between ages 10 and 18 from 1993 to 2001, researchers found that those who grew up in more polluted areas face the increased risk of having underdeveloped lungs, which may never recover to their full capacity. The average drop in lung function was 20 percent below what was expected for the child's age, similar to the impact of growing up in a home with parents who smoked.⁷⁶

Community health studies are pointing to less obvious, but serious effects from year-round exposure to ozone, especially for children. Scientists followed 500 Yale University students and

determined that living just four years in a region with high levels of ozone and related co-pollutants was associated with diminished lung function and frequent reports of respiratory symptoms.⁷⁷ A much larger study of 3,300 school children in Southern California found reduced lung function in girls with asthma and boys who spent more time outdoors in areas with high levels of ozone.⁷⁸

Cleaning Up Pollution Can Reduce Risk to Children

There is also real-world evidence that reducing air pollution can help protect children.

A just-published follow-up to that Southern California Children's Health study showed that reducing pollution could improve children's health. This time they tracked a different group of 863 children living in the same area, but growing up between 2007 and 2011, when the air in Southern California was much cleaner. They compared these children to those who had been part of their earlier studies when the air was dirtier. Children growing up in the cleaner air had much greater lung function, a benefit that may help them throughout their lives. As the researchers noted, their study suggested that "all children have the potential to benefit from improvements in air quality."⁷⁹

In Switzerland, particle pollution dropped during a period in the 1990s. Researchers there tracked 9,000 children over a nine-year period, following their respiratory symptoms. After taking other factors such as family characteristics and indoor air pollution into account, the researchers noted that during the years with less pollution, the children had fewer episodes of chronic cough, bronchitis, common cold, and conjunctivitis symptoms.⁸⁰

Disparities in the Impact of Air Pollution

to such pollution. Many studies have explored the differences in harm from air pollution to racial or ethnic groups and people who are in a low socioeconomic position, have less education, or live nearer to major sources,⁸¹ including a workshop the American

The burden of air pollution is not evenly shared. Poorer people and some racial and ethnic groups are among those who often face higher exposure to pollutants and who may experience greater responses

Lung Association held in 2001 that focused on urban air pollution and health inequities.⁸²

Many studies have looked at differences in the impact on premature death. Results have varied widely, particularly for effects between racial groups. Some studies have found no differences among races,⁸³ while others found greater responsiveness for Whites and Hispanics, but not African Americans,⁸⁴ or for African Americans but not other races or ethnic groups.⁸⁵ Other researchers have found greater risk for African Americans from air toxics, including those pollutants that also come from traffic sources.⁸⁶

Socioeconomic position has been more consistently associated with greater harm from air pollution. Recent studies show evidence of that link. Low socioeconomic status consistently increased the risk of premature death from fine particle pollution among 13.2 million Medicare recipients studied in the largest examination of particle pollution mortality nationwide.⁸⁷ In the 2008 study that found greater risk for premature death for African Americans, researchers also found greater risk for people living in areas with higher unemployment or higher use of public transportation.⁸⁸ A 2008 study of Washington, DC found that while poor air quality and worsened asthma went hand-in-hand in areas where Medicaid enrollment was high, the areas with the highest Medicaid enrollment did not always have the strongest association of high air pollution and asthma attacks.⁸⁹ However, two other recent studies in France have found no association with lower income and asthma attacks.⁹⁰

Scientists have speculated that there are three broad reasons why disparities may exist. First, groups may face greater exposure to pollution because of factors ranging from racism to class bias to housing market dynamics and land costs. For example, pollution sources may be located near disadvantaged communities, increasing exposure to harmful pollutants. Second, low social position may make some groups more susceptible to health threats because of factors related to their disadvantage. Lack of access to health care, grocery stores and good jobs, poorer job opportunities, dirtier workplaces or higher traffic exposure are among the factors that could handicap groups and increase the risk of harm. Finally, existing health conditions, behaviors, or traits may predispose some groups to greater risk. For example, diabetics are

among the groups most at risk from air pollutants, and the elderly, African Americans, Mexican Americans and people living near a central city have higher incidence of diabetes.⁹¹

Communities of color also may be more likely to live in counties with higher levels of pollution. Non-Hispanic Blacks and Hispanics were more likely to live in counties that had worse problems with particle pollution, researchers found in a 2011 analysis. Non-Hispanic Blacks were also more likely to live in counties with worse ozone pollution. Income groups, by contrast, differed little in these exposures. However, since few rural counties have monitors, the primarily older, non-Hispanic white residents of those counties lack information about the air quality in their communities.⁹²

Unemployed people, those with low income or low education and non-Hispanic Blacks were found to be more likely to live in areas with higher exposures to particle pollution in a 2012 study. However, the different racial/ethnic and income groups were breathing often very different kinds of particles; the different composition and structure of these particles may have different health impacts.⁹³

Highways May Be Especially Dangerous for Breathing

Being in heavy traffic, or living near a road, may be even more dangerous than being in other places in a community. Growing evidence shows that the vehicle emissions coming directly from those highways may be higher than in the community as a whole, increasing the risk of harm to people who live or work near busy roads.

The number of people living “next to a busy road” may include 30 to 45 percent of the urban population in North America, according to the most recent review of the evidence. In January 2010, the Health Effects Institute published a major review of the evidence by a panel of expert scientists. The panel looked at over 700 studies from around the world, examining the health effects. They concluded that traffic pollution causes asthma attacks in children, and may cause a wide range of other effects including: the onset of childhood asthma, impaired lung function, premature death and death from cardiovascular diseases, and cardiovascular morbidity. The area most affected, they concluded, was roughly 0.2 mile to 0.3 mile (300 to 500 meters) from the highway.⁹⁴

Children and teenagers are among the most vulnerable—though not the only ones at risk. A Danish study found that long-term exposure to traffic air pollution may increase the risk of developing chronic obstructive pulmonary disease (COPD). They found that those most at risk were people who already had asthma or diabetes.⁹⁵ Studies have found increased risk of premature death from living near a major highway or an urban road.⁹⁶ Another study found an increase in risk of heart attacks from being in traffic, whether driving or taking public transportation.⁹⁷ Urban women in a Boston study experienced decreased lung function associated with traffic-related pollution.⁹⁸

How to Protect Yourself from Ozone and Particle Pollution

To minimize your exposure to ozone and particle pollution:

- Pay attention to forecasts for high air pollution days to know when to take precautions;
- Avoid exercising near high-traffic areas;
- Avoid exercising outdoors when pollution levels are high, or substitute an activity that requires less exertion;
- Do not let anyone smoke indoors and support measures to make all places smokefree; and
- Reduce the use of fireplaces and wood-burning stoves.

Bottom line: Help yourself and everyone else breathe easier. Support national, state and local efforts to clean up sources of pollution. Your life and the life of someone you love may depend on it.

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1. Ozone and particle pollution are the most widespread, but they aren't the only serious air pollutants. Others include carbon monoxide, lead, nitrogen dioxide, and sulfur dioxide, as well as scores of toxins such as mercury, arsenic, benzene, formaldehyde, and acid gases. However, the monitoring networks are not as widespread nationwide for the other pollutants.
 2. U.S. Environmental Protection Agency. *Integrated Science Assessment of Ozone and Related Photochemical Oxidants (Final Report)*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/076F, 2013.
 3. Mar TF, Koenig JQ. Relationship between visits to emergency departments for asthma and ozone exposure in greater Seattle, Washington. *Ann Allergy Asthma Immunol*. 2009; 103: 474-479. Villeneuve PJ, Chen L, Rowe BH, Coates F. Outdoor air pollution and emergency department visits for asthma among children and adults: A case-crossover study in northern Alberta, Canada. *Environ Health Global Access Sci Source*. 2007; 6: 40.

4. Medina-Ramón M, Schwartz J. Who is more vulnerable to die from ozone air pollution? *Epidemiology*. 2008; 19: 672-679.
5. Thaller EI, Petronell SA, Hochman D, Howard S, Chhikara RS, Brooks EG. Moderate Increases in Ambient PM 2.5 and Ozone Are Associated With Lung Function Decreases in Beach Lifeguards. *J Occp Environ Med*. 2008; 50: 202-211; Sawyer K, Brown J, Hazucha M, Bennett WD. The effect of exercise on nasal uptake of ozone in healthy human adults. *J Appl Physiol*. 2007;102: 1380-1386; Hu SC, Ben-Jebria A, Ultman JS. Longitudinal distribution of ozone absorption in the lung: Effects of respiratory flow. *J Appl Physiol*. 1994; 77: 574-583.
6. Horstman DH, Ball BA, Brown J, Gerrity T, Folinsbee LJ. Comparison of pulmonary responses of asthmatic and nonasthmatic subjects performing light exercise while exposed to a low level of ozone. *Toxicol Ind Health*. 1995; 11: 369-385; Kreit JW, Gross KB, Moore TB, Lorenzen TJ, D'Arcy J, Eschenbacher WL. Ozone-induced changes in pulmonary function and bronchial responsiveness in asthmatics. *J Appl Physiol*. 1989; 66: 217-222; Medina-Ramón M, Zanobetti A, Schwartz J. The Effect of Ozone and PM10 on Hospital Admissions for Pneumonia and Chronic Obstructive Pulmonary Disease: a national multicity study. *Am J Epidemiol*. 2006; 163(6):579-588.
7. Peel JL, Metzger KB, Klein M, Flanders WD, Mulholland JA, Tolbert PE. Ambient air pollution and cardiovascular emergency department visits in potentially sensitive groups. *Am J Epidemiol*. 2007; 165: 625-633; Medina-Ramón and Schwartz, 2008; Medina-Ramón M, Zanobetti A, Schwartz J, 2006.
8. Medina-Ramón and Schwartz, 2008; Stafoggia M, Forastiere F, Faustini A, Biggeri A, Bisanti L, et al. Susceptibility factors to ozone-related mortality: A population-based case-crossover analysis. *Am J Respir Crit Care Med*. 2010; 182: 376-384; Jerrett M, Burnett RT, Pope CA III, Ito K, Thurston G, Krewski D, Shi Y, Calle E, Thun M. Long-term ozone exposure and mortality. *N Engl J Med*. 2009;360: 1085-1095; Alexeeff SE, Litonjua AA, Suh H, Sparrow D, Vokonas PS, Schwartz J. Ozone exposure and lung function: Effect modified by obesity and airways hyperresponsiveness in the VA Normative Aging Study. *Chest*. 2007; 132: 1890-1897; McDonnell WF, Stewart PW, Smith MV. Prediction of ozone-induced lung function responses in humans. *Inhal Toxicol*. 2010; 22: 160-168. Lin S, Liu X, Le LH, Hwang SA. Chronic exposure to ambient ozone and asthma hospital admissions among children. *Environ Health Perspect*. 2008; 116: 1725-1730; Burra TA, Moineddin R, Agha MM, Glazier RH. Social disadvantage, air pollution, and asthma physician visits in Toronto, Canada. *Environ Res*. 2009;109: 567-574.
9. Thaller, et al., 2008.
10. Bell ML, McDermott A, Zeger SL, Samet JM, Dominici F. Ozone and short-term mortality in 95 US urban communities, 1987-2000. *JAMA*. 2004; 292:2372-2378. Gryparis A, Forsberg B, Katsouyanni K, et al. Acute Effects of Ozone on Mortality from the "Air Pollution and Health: a European approach" project. *Am J Respir Crit Care Med*. 2004; 170: 1080-1087. Bell ML, Dominici F, and Samet JM. A Meta-Analysis of Time-Series Studies of Ozone and Mortality with Comparison to the National Morbidity, Mortality, and Air Pollution Study. *Epidemiology*. 2005; 16:436-445. Levy JI, Chermerynski SM, Sarnat JA. Ozone Exposure and Mortality: an empiric Bayes metaregression analysis. *Epidemiology*. 2005; 16:458-468. Ito K, De Leon SF, Lippmann M. Associations Between Ozone and Daily Mortality: analysis and meta-analysis. *Epidemiology*. 2005; 16:446-429.
11. Zanobetti A, Schwartz J. Mortality displacement in the association of ozone with mortality: an analysis of 48 cities in the United States. *Am J Respir Crit Care Med*. 2008; 177:184-189; Katsouyanni K, Samet JM, Anderson HR, Atkinson R, Le Tertre A, et al. *Air pollution and health: A European and North American approach (APHENA)*. Boston, MA: Health Effects Institute, 2009; Samoli E, Zanobetti A, Schwartz J, Atkinson R, Le Tertre A, et al. The temporal pattern of mortality responses to ambient ozone in the APHEA project. *J Epidemiol Community Health*. 2009; 63: 960-966; Stafoggia M, et al, 2010.
12. Zanobetti and Schwartz. 2008.
13. Gent JF, Triche EW, Holford TR, Belanger K, Bracken MB, Beckett WS, Leaderer BP. Association of Low-Level Ozone and Fine Particles with Respiratory Symptoms in Children with Asthma. *JAMA*. 2003; 290:1859-1867; Desqueyroux H, Pujat JC, Prosper M, Squinazi F, Momas I. Short-Term Effects of Low-Level Air Pollution on Respiratory Health of Adults Suffering from Moderate to Severe Asthma. *Environ Res*. 2002; 89:29-37; Burnett RT, Brook JR, Yung WT, Dales RE, Krewski D. Association between Ozone and Hospitalization for Respiratory Diseases in 16 Canadian Cities. *Environ Res*. 1997; 72:24-31; Medina-Ramón M, Zanobetti A, Schwartz J. The Effect of Ozone and PM10 on Hospital Admissions for Pneumonia and Chronic Obstructive Pulmonary Disease: a national multicity study. *Am J Epidemiol*. 2006; 163(6):579-588.
14. Rich DQ, Mittleman MA, Link MS, Schwartz J, Luttmann-Gibson H, Catalano PJ, Speizer FE, Gold DR, Dockery DW. Increased Risk of Paroxysmal Atrial Fibrillation Episodes Associated with Acute Increases in Ambient Air Pollution. *Environ Health Perspect*. 2006; 114:120-123.
15. Ruidavets J-B, Cournot M, Cassadou S, Giroux M, Meybeck M, Ferrières J. Ozone Air Pollution is Associated with Acute Myocardial Infarction. *Circulation*. 2005; 111:563-569.
16. Azevedo JM, Gonçalves FL, de Fátima Andrade M. Long-range ozone transport and its impact on respiratory and cardiovascular health in the north of Portugal. *Int J Biometeorol*. 2011; 55: 187-202; Linares C, Diaz J. Short-term effect of concentrations of fine particulate matter on hospital admissions due to cardiovascular and respiratory causes among the over-75 age group in Madrid, Spain. *Public Health*. 2010; 124: 28-36; Middleton N, Yiallourou P, Kleanthous S, Kolokotroni O, Schwartz J, et al. A 10-year time-series analysis of respiratory and cardiovascular morbidity in Nicosia, Cyprus: The effect of short-term changes in air pollution and dust storms. *Environ Health*. 2008; 7: 39; Lee JT, Kim H, Cho YS, Hong YC, Ha EH, Park H. Air pollution and hospital admissions for ischemic heart diseases among individuals 64+ years of age residing in Seoul, Korea. *Arch Environ Health*. 2003; 58: 617-623; Wong TW, Lau TS, Yu TS, Neller A, Wong SL, Tam W, Pang SW. Air pollution and hospital admissions for respiratory and cardiovascular diseases in Hong Kong. *Occup Environ Med*. 1999; 56: 679-683.
17. Jerrett, et al., 2009.
18. Lin S, Liu X, Le LH, and Hwang S-A. Chronic exposure to ambient ozone and asthma hospital admissions among children. *Environ Health Perspect*. 2008; 116:1725-1730.
19. Islam T, McConnell R, Gauderman WJ, Avol E, Peters JM, and Gilliland F. Ozone, oxidant defense genes, and risk of asthma during adolescence. *Am J Respir Crit Care Med*. 2009; 177(4):388-395.
20. Salam MT, Millstein J, Li YF, Lurmann FW, Margolis HG, Gilliland FD. Birth outcomes and prenatal exposure to ozone, carbon monoxide, and particulate matter: Results from the Children's Health Study. *Environ Health Perspect*. 2005; 113: 1638-1644; Morello-Frosch R, Jesdale BM, Sadd JL, Pastor M. Ambient air pollution exposure and full-term birth weight in California. *Environ Health*. 2010; 9: 44; Hansen CA, Barnett AG, Pritchard G. The effect of ambient air pollution during early pregnancy on fetal ultrasonic measurements during mid-pregnancy. *Environ Health Perspect*. 2008; 116: 362-369; Mannes T, Jalaludin B, Morgan G, Lincoln D, Sheppard V, Corbett S. Impact of ambient air pollution on birth weight in Sydney, Australia. *Occup Environ Med*. 2005; 62: 524-530.
21. Parker JD, Akinbami LJ, Woodruff TJ. Air Pollution and Childhood Respiratory Allergies in the United States. *Environ Health Perspect*. 2009; 117:140-147.

22. U.S. EPA., 2013.
23. U.S. EPA. Integrated Science Assessment for Particulate Matter (Final Report). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/139F, 2009. Available at <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=216546>
24. U.S. EPA. Air Quality Criteria for Particulate Matter, October 2004. Available at <http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=87903>.
25. U.S. EPA, 2009.
26. Mar TF, Larson TV, Stier RA, Claiborn C, Koenig JQ. An analysis of the association between respiratory symptoms in subjects with asthma and daily air pollution in Spokane, Washington. *Inhal Toxicol.* 2004; 16: 809-815; Peel JL; Tolbert PE; Klein M; Metzger KB, Flanders WD, Knox T; Mulholland JA, Ryan PB, Frumkin H. Ambient air pollution and respiratory emergency department visits. *Epidemiology*, 2005; 16: 164-174.
27. Barnett AG, Williams GM, Schwartz J, Best TL, Neller AH, Petroeschovsky AL, Simpson RW. The effects of air pollution on hospitalizations for cardiovascular disease in elderly people in Australian and New Zealand cities. *Environ Health Perspect*, 2006; 114: 1018-1023.
28. Peel JL, Metzger KB, Klein M, Flanders WD, Mulholland JA, Tolbert PE. Ambient air pollution and cardiovascular emergency department visits in potentially sensitive groups. *Am J Epidemiol.* 2007; 165: 625-633. Pope CA III, Dockery DW. Health Effects of Fine Particulate Air Pollution: Lines that Connect. *J Air Waste Manage Assoc.* 2006; 56:709-742.
29. Zanobetti A, Schwartz J. Are Diabetics More Susceptible to the Health Effects of Airborne Particles? *Am J Respir Crit Care Med.* 2001; 164: 831-833. National Research Council. Research Priorities for Airborne Particulate Matter: IV. Continuing Research Progress. Washington, DC: The National Academies Press, 2004.
30. Ostro B, Broadwin R, Green S, Feng WY, Lipsett M. Fine particulate air pollution and mortality in nine California counties: results from CALFINE. *Environ Health Perspect.* 2006; 114: 29-33; Ostro B, Feng WY, Broadwin R, Malig B, Green S, Lipsett M. The Impact of Components of Fine Particulate Matter on Cardiovascular Mortality in Susceptible Subpopulations. *Occup Environ Med.* 2008; 65(11):750-6.
31. U.S. EPA, 2009.
32. Miller, 2007; O'Neill MS, Veves A, Zanobetti A, Sarnat JA, Gold DR, Economides PA, Horton ES, Schwartz J. Diabetes Enhances Vulnerability to Particulate Air Pollution-Associated Impairment in Vascular Reactivity and Endothelial Function. *Circulation.* 2005; 111:2913-2920;
33. Pearson JF, Bachireddy C, Shyamprasad S, Goldfinch AB, Brownstein JS. Association Between Fine Particulate Matter and Diabetes Prevalence in the U.S. *Diabetes Care.* 2010; 10: 2196-2201.
34. Correia AW, Pope CA III, Dockery DW, Wang Y, Ezzati M, Domenici F. Effect of Air Pollution Control on Life Expectancy in the United States: An Analysis of 545 U.S. Counties for the Period from 2000 to 2007. *Epidemiology.* 2013; 24(1): 23-31.
35. Lepeule J, Laden F, Dockery D, Schwartz J. Chronic Exposure to Fine Particles and Mortality: An Extended Follow-up of the Harvard Six Cities Study from 1974 to 2009. *Environ Health Perspect.* 2012; 120:965-970.
36. Pope and Dockery, 2006.
37. Schwartz J, Coull B, Laden F, Ryan L. The Effect of Dose and Timing of Dose on the Association between Airborne Particles and Survival. *Environ Health Perspect.* 2008; 116:64-69.
38. Pope and Dockery, 2006.
39. Zanobetti A, Schwartz J, Samoli E, Gryparis A, Tuoloumi G, Peacock J, Anderson RH, Le Tertre A, Bobros J, Celko M, Goren A, Forsberg B, Michelozzi P, Rabcszenko D, Perez Hoyos S, Wichmann HE, Katsouyanni K. The Temporal Pattern of Respiratory and Heart Disease Mortality in Response to Air Pollution. *Environ Health Perspect.* 2003; 111:1188-1193; Domenici F, McDermott A, Zeger SL, Samet JM. Airborne Particulate Matter and Mortality: Timescale Effects in Four US Cities. *Am J Epidemiol.* 2003; 157:1055-1065.
40. Domenici F, McDermott A, Zeger SL, Samet JM. On the Use of Generalized Additive Models in Time-Series Studies of Air Pollution and Health. *Am J Epidemiol.* 2002; 156:193-203.
41. Hong Y-C, Lee J-T, Kim H, Ha E-H, Schwartz J, Christiani DC. Effects of Air Pollutants on Acute Stroke Mortality. *Environ Health Perspect.* 2002; 110:187-191.
42. Tsai SS, Goggins WB, Chiu HF, Yang CY. Evidence for an Association Between Air Pollution and Daily Stroke Admissions in Kaohsiung, Taiwan. *Stroke.* 2003; 34: 2612-6.
43. Wellenius GA, Schwartz J, Mittleman MA. Air Pollution and Hospital Admissions for Ischemic and Hemorrhagic Stroke Among Medicare Beneficiaries. *Stroke.* 2005; 36:2549-2553.
44. Pope and Dockery, 2006.
45. D'Ippoliti D, Forastiere F, Ancona C, Agabity N, Fusco D, Michelozzi P, Perucci CA. Air Pollution and Myocardial Infarction in Rome: a case-crossover analysis. *Epidemiology.* 2003;14:528-535. Zanobetti A, Schwartz J. The Effect of Particulate Air Pollution on Emergency Admissions for Myocardial Infarction: a multicity case-crossover analysis. *Environ Health Perspect.* 2005; 113:978-982.
46. Ghio AJ, Kim C, Devlin RB. Concentrated Ambient Air Particles Induce Mild Pulmonary Inflammation in Healthy Human Volunteers. *Am J Respir Crit Care Med.* 2000; 162(3 Pt 1):981-988.
47. Metzger KB, Tolbert PE, Klein M, Peel JL, Flanders WD, Todd K, Mulholland JA, Ryan PB, Frumkin H. Ambient Air Pollution and Cardiovascular Emergency Department Visits in Atlanta, Georgia, 1993-2000. *Epidemiology.* 2004; 15: 46-56.
48. Tsai, et al., 2003.
49. Wellenius GA, Schwartz J, Mittleman MA. Particulate Air Pollution and Hospital Admissions for Congestive Heart Failure in Seven United States Cities. *Am J Cardiol.* 2006; 97 (3):404-408; Wellenius GA, Bateson TF, Mittleman MA, Schwartz J. Particulate Air Pollution and the Rate of Hospitalization for Congestive Heart Failure among Medicare Beneficiaries in Pittsburgh, Pennsylvania. *Am J Epidemiol.* 2005; 161:1030-1036.
50. Van Den Eeden SK, Quesenberry CP Jr, Shan J, Lurmann F. *Particulate Air Pollution and Morbidity in the California Central Valley: a high particulate pollution region.* Final Report to the California Air Resources Board, 2002.
51. Lin M, Chen Y, Burnett RT, Villeneuve PJ, Kerwski D. The Influence of Ambient Coarse Particulate Matter on Asthma Hospitalization in Children: case-crossover and time-series analyses. *Environ Health Perspect.* 2002; 110:575-581.
52. Norris G, YoungPong SN, Koenig JQ, Larson TV, Sheppard L, Stout JW. An Association Between Fine Particles and Asthma Emergency Department Visits for Children in Seattle. *Environ Health Perspect.* 1999;107:489-493.
53. Tolbert PE, Mulholland JA, MacIntosh DD, Xu F, Daniels D, Devine OJ, Carlin BP, Klein M, Dorley J, Butler AJ, Nordenberg DF, Frumkin H, Ryan PB, White MC. Air Quality and Pediatric Emergency Room Visits for Asthma in Atlanta, Georgia. *Am J Epidemiol.* 2000; 151:798-810.

54. Slaughter JC, Lumley T, Sheppard L, Koenig JQ, Shapiro, GG. Effects of Ambient Air Pollution on Symptom Severity and Medication Use in Children with Asthma. *Ann Allergy Asthma Immunol*. 2003; 91:346-353.
55. Thaller, et al., 2008.
56. Dockery DW, Pope CA III, Xu X, Spengler JD, Ware JH, Fay ME, Ferris BG, Speizer FE. An Association Between Air Pollution and Mortality in Six U.S. Cities. *N Engl J Med*. 1993; 329:1753-1759. Pope CA, Thun MJ, Namboodiri MM, Dockery DW, Evans JS, Speizer FE, Heath CW. Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults. *Am J Respir Crit Care Med*. 1995; 151:669-674.
57. Zanobetti A, Schwartz J. The effect of fine and coarse particulate air pollution on mortality: A national analysis. *Environ Health Perspect*. 2009; 117:1-40 2009; Krewski D; Jerrett M; Burnett RT; Ma R; Hughes E; Shi Y; Turner MC; Pope AC III; Thurston G; Calle EE; Thun MJ. Extended follow-up and spatial analysis of the American Cancer Society study linking particulate air pollution and mortality. Report Nr. 140 (Cambridge, MA: Health Effects Institute, 2009); Franklin M, Zeka A, Schwartz J. Association between PM_{2.5} and all-cause and specific cause mortality in 27 U.S. communities. *J Expo Sci Environ Epidemiol*. 2007; 18: 1005-1011. 2007 Lepeule et al, 2012; Pope CA III, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston GD. Lung Cancer, Cardiopulmonary Mortality, and Long-Term Exposure to Fine Particulate Air Pollution. *JAMA*. 2002; 287(9):1132-1141.
58. Pope CA III. *Epidemiology of Fine Particulate Air Pollution and Human Health: biological mechanisms and who's at risk?* *Environ Health Perspect*. 2000;108: 713-723.
59. Hamra GB, Guha N, Cohen A, Laden F, Raaschou-Nielsen O, Samet JM, Vineis P, Forastiere F, Saldiva P, Yorifuji T, and Loomis D. Outdoor Particulate Matter Exposure and Lung Cancer: A Systematic Review and Meta-Analysis. *Environ Health Perspect*. 2014; 122: 906-911.
60. Lin S, Munsie JP, Hwang SA, Fitzgerald E, Cayo MR. Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic. *Environ Res*. 2002; 88:73-81.
61. Gauderman WJ, Vora H, McConnell R, Berhane K, Gilliland GF, Thomas D, Lurmann F, Avol E, Kuenzli N, Jarrett M, Peters J. Effect of Exposure to Traffic on Lung Development from 10 to 18 Years of Age: a cohort study. *Lancet*. 2007; 369:571-577.
62. Gauderman WJ, Gilliland GF, Vora H, Avol E, Stram D, McConnell R, Thomas D, Lurmann F, Margolis HG, Rappaport EB, Berhane K, Peters JM. Association between Air Pollution and Lung Function Growth in Southern California Children: results from a second cohort. *Am J Respir Crit Care Med*. 2002;166:76-84.
63. Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med*. 2004; 351:1057-1067.
64. Churg, A Brauer, M, Avila-Casado, MdC, Fortoul TI, Wright JL. Chronic Exposure to High Levels of Particulate Air Pollution and Small Airway Remodeling. *Environ Health Perspect*. 2003; 111: 714-718.
65. Pope CA III, Burnett RT, Thurston GD, Thun MJ, Calle EE, Krewski D, Godleski JJ. Cardiovascular Mortality and Year-round Exposure to Particulate Air Pollution: epidemiological evidence of general pathophysiological pathways of disease. *Circulation*. 2004; 109:71-77.
66. Bell ML, Ebisu K, Belanger K. Ambient Air Pollution and low birth weight in Connecticut and Massachusetts. *Environ Health Perspect*. 2007; 115: 118-24; Ritz B, Wilhelm M, Zhao Y. Air pollution and infant death in southern California, 1989-2000. *Pediatrics*. 2006; 118: 493-502; Woodruff TJ, Parker JD, Schoendorf KC. Fine particulate matter (PM 2.5) air pollution and selected causes of postneonatal infant mortality in California. *Environ Health Perspect*. 2006; 114: 785-790.
67. Miller KA, Siscovick DS, Shepard L, Shepherd K, Sullivan JH, Anderson GL, Kaufman JD. Long-Term Exposure to Air Pollution and Incidence of Cardiovascular Events in Women. *N Engl J Med*. 2007; 356: 447-458.
68. U.S. EPA, 2009.
69. U.S. EPA, 2009.
70. U.S. EPA, 2009.
71. U.S. EPA, 2009.
72. Dietert RR, Etzel RA, Chen D, et al. Workshop to Identify Critical Windows of Exposure for Children's Health: immune and respiratory systems workgroup summary. *Environ Health Perspect*. 2000; 108 (supp 3); 483-490.
73. World Health Organization: The Effects of Air Pollution on Children's Health and Development: a review of the evidence E86575. 2005. Available at <http://www.euro.who.int/document/E86575.pdf>.
74. WHO, 2005.
75. American Academy of Pediatrics Committee on Environmental Health, Ambient Air Pollution: health hazards to children. *Pediatrics*. 2004; 114: 1699-1707. Statement was reaffirmed in 2010.
76. Gauderman et al., 2004.
77. Galizia A, Kinney PL. Year-round Residence in Areas of High Ozone: association with respiratory health in a nationwide sample of nonsmoking young adults. *Environ Health Perspect*. 1999; 107:675-679.
78. Peters JM, Avol E, Gauderman WJ, Linn WS, Navidi W, London SJ, Margolis H, Rappaport E, Vora H, Gong H, Thomas DC. A Study of Twelve Southern California Communities with Differing Levels and Types of Air Pollution. II. Effects on Pulmonary Function. *Am J Respir Crit Care Med*. 1999; 159:768-775.
79. Gauderman WJ, Urman R, Avol E, Berhane K, McConnell R, Rappaport E, Chang R, Lurmann F, Gilliland F. Association of Improved Air Quality with Lung Development in children. *N Engl J Med*. 2015; (372): 905-913.
80. Bayer-Oglesby L, Grize L, Gassner M, Takken-Sahli K, Sennhauser FH, Neu U, Schindler C, Braun-Fahrlander C. Decline of Ambient Air Pollution Levels and Improved Respiratory Health in Swiss Children. *Environ Health Perspect*. 2005; 113:1632-1637.
81. Institute of Medicine. *Toward Environmental Justice: Research, Education, and Health Policy Needs*. Washington, DC: National Academy Press, 1999; O'Neill MS, Jerrett M, Kawachi I, Levy JI, Cohen AJ, Gouveia N, Wilkinson P, Fletcher T, Cifuentes L, Schwartz J et al. Health, Wealth, and Air Pollution: Advancing Theory and Methods. *Environ Health Perspect*. 2003; 111: 1861-1870; Finkelstein MM; Jerrett M; DeLuca P; Finkelstein N; Verma DK, Chapman K, Sears MR. Relation Between Income, Air Pollution And Mortality: A Cohort Study. *CMAJ*. 2003; 169: 397-402; Ostro B, Broadwin R, Green S, Feng W, Lipsett M. Fine Particulate Air Pollution and Mortality in Nine California Counties: Results from CALFINE. *Environ Health Perspect*. 2005: 114: 29-33; Zeka A, Zanobetti A, Schwartz J. Short term effects of particulate matter on cause specific mortality: effects of lags and modification by city characteristics. *Occup Environ Med*. 2006: 62: 718-725.
82. American Lung Association. Urban Air Pollution and Health Inequities: A Workshop Report. *Environ Health Perspect*. 2001: 109(suppl 3): 357-374.

83. Zeka A, Zanobetti A, Schwartz J. Individual-Level Modifiers of the Effects of Particulate Matter on Daily Mortality. *Am J Epidemiol*. 2006; 163: 849-859.
84. Ostro, et al., 2006; Ostro, et al., 2008.
85. Bell ML, Dominici F. Effect Modification by Community Characteristics on the Short-term Effects of Ozone Exposure and Mortality in 98 US Communities. *Am J Epidemiol*. 2008; 167:986-997.
86. Apelberg BJ, Buckley TJ, White RH. Socioeconomic and Racial Disparities in Cancer Risk from Air Toxics in Maryland. *Environ Health Perspect*. 2005; 113:693-699.
87. Zeger SL, Dominici F, McDermott A, Samet J. Mortality in the Medicare Population and Chronic Exposure to Fine Particulate Air Pollution in Urban Centers (2000-2005). *Environ Health Perspect*. 2008; 116:1614-1619.
88. Bell and Dominici, 2008.
89. Babin S, Burkom H, Holtry R, Taberner N, Davies-Cole J, Stokes L, Dehaan K, Lee D. Medicaid Patient Asthma-Related Acute Care Visits And Their Associations with Ozone and Particulates in Washington, DC, from 1994-2005. *Int J Environ Health Res*. 2008; 18(3):209-221.
90. Laurent O, Pedrono G, Segala C, Filleul L, Havard S, Deguen S, Schillinger C, Rivière E, Bard D. Air pollution, asthma attacks, and socioeconomic deprivation: a small-area case-crossover study. *Am J Epidemiol*. 2008; 168:58-65; Laurent O, Pedrono G, Filleul L, Segala C, Lefranc A, Schillinger C, Riviere E, Bard D. Influence of Socioeconomic Deprivation on the Relation Between Air Pollution and Beta-Agonist Sales for Asthma. *Chest*. 2009; 135(3):717-716.
91. O'Neill et al., 2003.
92. Miranda ML, Edwards SE, Keating MH, Paul CJ. Making the Environmental Justice Grade: The Relative Burden of Air Pollution Exposure in the United States. *Int J Environ Res Public Health*. 2011; 8: 1755-1771.
93. Bell ML, Ebisu K. Environmental Inequality in Exposures to Airborne Particulate Matter Component in the United States. *Environ Health Perspect*. 2012; 120:1699-1704.
94. Health Effects Institute Panel on the Health Effects of Traffic-Related Air Pollution. *Traffic-Related Air Pollution: A Critical Review of the Literature on Emissions, Exposure, and Health Effects*. Health Effects Institute: Boston, 2010. Available at www.healtheffects.org.
95. Andersen ZJ, Hvidberg M, Jensen SS, Ketzel M, Loft S, Sørensen M, Tjønneland A, Overvad K, and Raaschou-Nielsen O. Chronic Obstructive Pulmonary Disease and Long-Term Exposure to Traffic-related Air Pollution: A Cohort Study. *Am J Respir Crit Care Med*. 2011; 183:455-461.
96. Finklestein MM, Jerrett M., Sears M.R. Traffic Air Pollution and Mortality Rate Advancement Periods. *Am J Epidemiol*. 2004; 160:173-177; Hoek G, Brunkreef B, Goldbohn S, Fischer P, van den Brandt. Associations between mortality and indicators of traffic-related air pollution in the Netherlands: a cohort study. *Lancet*. 2002; 360:1203-1209.
97. Peters A, von Klot S, Heier M, Trentinaglia I, Cyrys J, Hormann A, Hauptmann M, Wichmann HE, Lowel H. Exposure to Traffic and the Onset of Myocardial Infarction. *N Engl J Med*. 2004; 351:1721-1730.
98. Suglia SF, Gryparis A, Schwartz J, Wright RJ. Association between Traffic-Related Black Carbon Exposure and Lung Function among Urban Women. *Environ Health Perspect*. 2008; 116(10):1333-1337.

CIVIL COVER SHEET

The JS 44 civil cover sheet and the information contained herein neither replace nor supplement the filing and service of pleadings or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. (SEE INSTRUCTIONS ON NEXT PAGE OF THIS FORM.)

I. (a) PLAINTIFFS

See attachment.

(b) County of Residence of First Listed Plaintiff (EXCEPT IN U.S. PLAINTIFF CASES)

(c) Attorneys (Firm Name, Address, and Telephone Number)

See attachment.

DEFENDANTS

See attachment.

County of Residence of First Listed Defendant (IN U.S. PLAINTIFF CASES ONLY)

NOTE: IN LAND CONDEMNATION CASES, USE THE LOCATION OF THE TRACT OF LAND INVOLVED.

Attorneys (If Known)

II. BASIS OF JURISDICTION (Place an "X" in One Box Only)

- 1 U.S. Government Plaintiff, 2 U.S. Government Defendant, 3 Federal Question, 4 Diversity

III. CITIZENSHIP OF PRINCIPAL PARTIES (Place an "X" in One Box for Plaintiff and One Box for Defendant)

- Citizen of This State, Citizen of Another State, Citizen or Subject of a Foreign Country, PTF DEF, Incorporated or Principal Place of Business In This State, Incorporated and Principal Place of Business In Another State, Foreign Nation

IV. NATURE OF SUIT (Place an "X" in One Box Only)

Table with 5 columns: CONTRACT, REAL PROPERTY, TORTS, CIVIL RIGHTS, PRISONER PETITIONS, FORFEITURE/PENALTY, LABOR, IMMIGRATION, BANKRUPTCY, SOCIAL SECURITY, FEDERAL TAX SUITS, OTHER STATUTES. Includes various legal categories like Insurance, Personal Injury, Labor, etc.

V. ORIGIN (Place an "X" in One Box Only)

- 1 Original Proceeding, 2 Removed from State Court, 3 Remanded from Appellate Court, 4 Reinstated or Reopened, 5 Transferred from Another District, 6 Multidistrict Litigation

VI. CAUSE OF ACTION

Cite the U.S. Civil Statute under which you are filing (Do not cite jurisdictional statutes unless diversity): See attachment. Brief description of cause: See attachment.

VII. REQUESTED IN COMPLAINT:

CHECK IF THIS IS A CLASS ACTION UNDER RULE 23, F.R.Cv.P. DEMAND \$ CHECK YES only if demanded in complaint: JURY DEMAND: Yes No

VIII. RELATED CASE(S) IF ANY

(See instructions): JUDGE DOCKET NUMBER

DATE 12/14/2018 SIGNATURE OF ATTORNEY OF RECORD s/ Jeremy C. Lieb

FOR OFFICE USE ONLY

RECEIPT # AMOUNT APPLYING IFP JUDGE MAG. JUDGE

INSTRUCTIONS FOR ATTORNEYS COMPLETING CIVIL COVER SHEET FORM JS 44

Authority For Civil Cover Sheet

The JS 44 civil cover sheet and the information contained herein neither replaces nor supplements the filings and service of pleading or other papers as required by law, except as provided by local rules of court. This form, approved by the Judicial Conference of the United States in September 1974, is required for the use of the Clerk of Court for the purpose of initiating the civil docket sheet. Consequently, a civil cover sheet is submitted to the Clerk of Court for each civil complaint filed. The attorney filing a case should complete the form as follows:

- I.(a) Plaintiffs-Defendants.** Enter names (last, first, middle initial) of plaintiff and defendant. If the plaintiff or defendant is a government agency, use only the full name or standard abbreviations. If the plaintiff or defendant is an official within a government agency, identify first the agency and then the official, giving both name and title.
- (b) County of Residence.** For each civil case filed, except U.S. plaintiff cases, enter the name of the county where the first listed plaintiff resides at the time of filing. In U.S. plaintiff cases, enter the name of the county in which the first listed defendant resides at the time of filing. (NOTE: In land condemnation cases, the county of residence of the "defendant" is the location of the tract of land involved.)
- (c) Attorneys.** Enter the firm name, address, telephone number, and attorney of record. If there are several attorneys, list them on an attachment, noting in this section "(see attachment)".
- II. Jurisdiction.** The basis of jurisdiction is set forth under Rule 8(a), F.R.Cv.P., which requires that jurisdictions be shown in pleadings. Place an "X" in one of the boxes. If there is more than one basis of jurisdiction, precedence is given in the order shown below.
 United States plaintiff. (1) Jurisdiction based on 28 U.S.C. 1345 and 1348. Suits by agencies and officers of the United States are included here.
 United States defendant. (2) When the plaintiff is suing the United States, its officers or agencies, place an "X" in this box.
 Federal question. (3) This refers to suits under 28 U.S.C. 1331, where jurisdiction arises under the Constitution of the United States, an amendment to the Constitution, an act of Congress or a treaty of the United States. In cases where the U.S. is a party, the U.S. plaintiff or defendant code takes precedence, and box 1 or 2 should be marked.
 Diversity of citizenship. (4) This refers to suits under 28 U.S.C. 1332, where parties are citizens of different states. When Box 4 is checked, the citizenship of the different parties must be checked. (See Section III below; **NOTE: federal question actions take precedence over diversity cases.**)
- III. Residence (citizenship) of Principal Parties.** This section of the JS 44 is to be completed if diversity of citizenship was indicated above. Mark this section for each principal party.
- IV. Nature of Suit.** Place an "X" in the appropriate box. If the nature of suit cannot be determined, be sure the cause of action, in Section VI below, is sufficient to enable the deputy clerk or the statistical clerk(s) in the Administrative Office to determine the nature of suit. If the cause fits more than one nature of suit, select the most definitive.
- V. Origin.** Place an "X" in one of the six boxes.
 Original Proceedings. (1) Cases which originate in the United States district courts.
 Removed from State Court. (2) Proceedings initiated in state courts may be removed to the district courts under Title 28 U.S.C., Section 1441. When the petition for removal is granted, check this box.
 Remanded from Appellate Court. (3) Check this box for cases remanded to the district court for further action. Use the date of remand as the filing date.
 Reinstated or Reopened. (4) Check this box for cases reinstated or reopened in the district court. Use the reopening date as the filing date.
 Transferred from Another District. (5) For cases transferred under Title 28 U.S.C. Section 1404(a). Do not use this for within district transfers or multidistrict litigation transfers.
 Multidistrict Litigation. (6) Check this box when a multidistrict case is transferred into the district under authority of Title 28 U.S.C. Section 1407. When this box is checked, do not check (5) above.
- VI. Cause of Action.** Report the civil statute directly related to the cause of action and give a brief description of the cause. **Do not cite jurisdictional statutes unless diversity.** Example: U.S. Civil Statute: 47 USC 553 Brief Description: Unauthorized reception of cable service
- VII. Requested in Complaint.** Class Action. Place an "X" in this box if you are filing a class action under Rule 23, F.R.Cv.P.
 Demand. In this space enter the actual dollar amount being demanded or indicate other demand, such as a preliminary injunction.
 Jury Demand. Check the appropriate box to indicate whether or not a jury is being demanded.
- VIII. Related Cases.** This section of the JS 44 is used to reference related pending cases, if any. If there are related pending cases, insert the docket numbers and the corresponding judge names for such cases.

Date and Attorney Signature. Date and sign the civil cover sheet.

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3 **ATTACHMENT TO CIVIL COVER SHEET**

4 **I. (a)**

5 **PLAINTIFFS**

6 CITIZENS FOR CLEAN AIR, a project of ALASKA COMMUNITY ACTION ON TOXICS

7 SIERRA CLUB

8 **DEFENDANTS**

9 ANDREW WHEELER, in his official capacity as Acting Administrator of the United States
10 Environmental Protection Agency

11 CHRIS HLADICK, in his official capacity as Regional Administrator of the United States
12 Environmental Protection Agency Region 10

13 **I. (b)**

14 **County of Residence of First Listed Plaintiff**

15 Fairbanks North Star Borough, Alaska

16 **I. (c) ATTORNEYS FOR PLAINTIFFS**

17 Jeremy C. Lieb
18 EARTHJUSTICE
19 441 W 5th Avenue, Suite 301
20 Anchorage, AK 99501
21 T: 907.792.7104

22 Erik Grafe
23 EARTHJUSTICE
24 441 W 5th Avenue, Suite 301
25 Anchorage, AK 99501
26 T: 907.792.7102

Kristen L. Boyles
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104
T: 206.343.7340

1 **VI. CAUSE OF ACTION**

2 **Cite the U.S. Civil Statute under which you are filing (Do not cite jurisdictional statutes**
3 **unless diversity):**

4 Clean Air Act citizen suit provision, 42 U.S.C. § 7604

5 **Brief description of cause:**

6 Challenge to the U.S. Environmental Protection Agency's failure to fulfill its statutory duty to
7 issue a finding that the State of Alaska has failed to submit a state implementation plan to
8 address violations of the 24-hour national ambient air quality standard for fine particulate matter
9 in the Fairbanks North Star Borough, Alaska.

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AO 440 (Rev. 06/12) Summons in a Civil Action

UNITED STATES DISTRICT COURT

for the

Western District of Washington

CITIZENS FOR CLEAN AIR, a project of
ALASKA COMMUNITY ACTION ON TOXICS, and
SIERRA CLUB,

Plaintiff(s)

v.

ANDREW WHEELER, in his official capacity as Acting
Administrator of the United States Environmental Protection
Agency, and CHRIS HLADICK, in his official capacity as Regional
Administrator of the United States Environmental Protection
Agency Region 10,

Defendant(s)

Civil Action No. 2:18-cv-01803

SUMMONS IN A CIVIL ACTION

To: (Defendant's name and address) Andrew Wheeler, Acting Administrator
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

A lawsuit has been filed against you.

Within 21 days after service of this summons on you (not counting the day you received it) — or 60 days if you
are the United States or a United States agency, or an officer or employee of the United States described in Fed. R. Civ.
P. 12 (a)(2) or (3) — you must serve on the plaintiff an answer to the attached complaint or a motion under Rule 12 of
the Federal Rules of Civil Procedure. The answer or motion must be served on the plaintiff or plaintiff's attorney,
whose name and address are:

Jeremy C. Lieb
Erik Grafe
EARTHJUSTICE
441 W 5th Avenue, Suite 301
Anchorage, AK 99501

Kristen L. Boyles
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104

If you fail to respond, judgment by default will be entered against you for the relief demanded in the complaint.
You also must file your answer or motion with the court.

CLERK OF COURT

Date:

Signature of Clerk or Deputy Clerk

Civil Action No. 2:18-cv-01803

PROOF OF SERVICE

(This section should not be filed with the court unless required by Fed. R. Civ. P. 4 (l))

This summons for *(name of individual and title, if any)* _____
was received by me on *(date)* _____.

I personally served the summons on the individual at *(place)* _____
_____ on *(date)* _____; or

I left the summons at the individual's residence or usual place of abode with *(name)* _____
_____, a person of suitable age and discretion who resides there,
on *(date)* _____, and mailed a copy to the individual's last known address; or

I served the summons on *(name of individual)* _____, who is
designated by law to accept service of process on behalf of *(name of organization)* _____
_____ on *(date)* _____; or

I returned the summons unexecuted because _____; or

Other *(specify)*:

My fees are \$ _____ for travel and \$ _____ for services, for a total of \$ _____ 0.00 _____.

I declare under penalty of perjury that this information is true.

Date: _____

Server's signature

Printed name and title

Server's address

Additional information regarding attempted service, etc:

AO 440 (Rev. 06/12) Summons in a Civil Action

UNITED STATES DISTRICT COURT

for the

Western District of Washington

CITIZENS FOR CLEAN AIR, a project of
ALASKA COMMUNITY ACTION ON TOXICS, and
SIERRA CLUB,

Plaintiff(s)

v.

ANDREW WHEELER, in his official capacity as Acting
Administrator of the United States Environmental Protection
Agency, and CHRIS HLADICK, in his official capacity as Regional
Administrator of the United States Environmental Protection
Agency Region 10,

Defendant(s)

Civil Action No. 2:18-cv-01803

SUMMONS IN A CIVIL ACTION

To: (Defendant's name and address) Chris Hladick, Regional Administrator
United States Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101

A lawsuit has been filed against you.

Within 21 days after service of this summons on you (not counting the day you received it) — or 60 days if you
are the United States or a United States agency, or an officer or employee of the United States described in Fed. R. Civ.
P. 12 (a)(2) or (3) — you must serve on the plaintiff an answer to the attached complaint or a motion under Rule 12 of
the Federal Rules of Civil Procedure. The answer or motion must be served on the plaintiff or plaintiff's attorney,
whose name and address are:

Jeremy C. Lieb
Erik Grafe
EARTHJUSTICE
441 W 5th Avenue, Suite 301
Anchorage, AK 99501

Kristen L. Boyles
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104

If you fail to respond, judgment by default will be entered against you for the relief demanded in the complaint.
You also must file your answer or motion with the court.

CLERK OF COURT

Date:

Signature of Clerk or Deputy Clerk

Civil Action No. 2:18-cv-01803

PROOF OF SERVICE

(This section should not be filed with the court unless required by Fed. R. Civ. P. 4 (l))

This summons for *(name of individual and title, if any)* _____
was received by me on *(date)* _____.

I personally served the summons on the individual at *(place)* _____
_____ on *(date)* _____; or

I left the summons at the individual's residence or usual place of abode with *(name)* _____
_____, a person of suitable age and discretion who resides there,
on *(date)* _____, and mailed a copy to the individual's last known address; or

I served the summons on *(name of individual)* _____, who is
designated by law to accept service of process on behalf of *(name of organization)* _____
_____ on *(date)* _____; or

I returned the summons unexecuted because _____; or

Other *(specify)*:

My fees are \$ _____ for travel and \$ _____ for services, for a total of \$ _____ 0.00 _____.

I declare under penalty of perjury that this information is true.

Date: _____

Server's signature

Printed name and title

Server's address

Additional information regarding attempted service, etc:

AO 440 (Rev. 06/12) Summons in a Civil Action

UNITED STATES DISTRICT COURT

for the

Western District of Washington

CITIZENS FOR CLEAN AIR, a project of
ALASKA COMMUNITY ACTION ON TOXICS, and
SIERRA CLUB,

Plaintiff(s)

v.

ANDREW WHEELER, in his official capacity as Acting
Administrator of the United States Environmental Protection
Agency, and CHRIS HLADICK, in his official capacity as Regional
Administrator of the United States Environmental Protection
Agency Region 10,

Defendant(s)

Civil Action No. 2:18-cv-01803

SUMMONS IN A CIVIL ACTION

To: (Defendant's name and address) Matthew G. Whitaker, Acting Attorney General
U.S. Department of Justice
950 Pennsylvania Avenue, NW
Washington, DC 20530

A lawsuit has been filed against you.

Within 21 days after service of this summons on you (not counting the day you received it) — or 60 days if you
are the United States or a United States agency, or an officer or employee of the United States described in Fed. R. Civ.
P. 12 (a)(2) or (3) — you must serve on the plaintiff an answer to the attached complaint or a motion under Rule 12 of
the Federal Rules of Civil Procedure. The answer or motion must be served on the plaintiff or plaintiff's attorney,
whose name and address are:

Jeremy C. Lieb
Erik Grafe
EARTHJUSTICE
441 W 5th Avenue, Suite 301
Anchorage, AK 99501

Kristen L. Boyles
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104

If you fail to respond, judgment by default will be entered against you for the relief demanded in the complaint.
You also must file your answer or motion with the court.

CLERK OF COURT

Date:

Signature of Clerk or Deputy Clerk

Civil Action No. 2:18-cv-01803

PROOF OF SERVICE

(This section should not be filed with the court unless required by Fed. R. Civ. P. 4 (l))

This summons for *(name of individual and title, if any)* _____
was received by me on *(date)* _____.

I personally served the summons on the individual at *(place)* _____
_____ on *(date)* _____; or

I left the summons at the individual's residence or usual place of abode with *(name)* _____
_____, a person of suitable age and discretion who resides there,
on *(date)* _____, and mailed a copy to the individual's last known address; or

I served the summons on *(name of individual)* _____, who is
designated by law to accept service of process on behalf of *(name of organization)* _____
_____ on *(date)* _____; or

I returned the summons unexecuted because _____; or

Other *(specify)*:

My fees are \$ _____ for travel and \$ _____ for services, for a total of \$ _____ 0.00 _____.

I declare under penalty of perjury that this information is true.

Date: _____

Server's signature

Printed name and title

Server's address

Additional information regarding attempted service, etc:

AO 440 (Rev. 06/12) Summons in a Civil Action

UNITED STATES DISTRICT COURT

for the

Western District of Washington

CITIZENS FOR CLEAN AIR, a project of
ALASKA COMMUNITY ACTION ON TOXICS, and
SIERRA CLUB,

Plaintiff(s)

v.

ANDREW WHEELER, in his official capacity as Acting
Administrator of the United States Environmental Protection
Agency, and CHRIS HLADICK, in his official capacity as Regional
Administrator of the United States Environmental Protection
Agency Region 10,

Defendant(s)

Civil Action No. 2:18-cv-01803

SUMMONS IN A CIVIL ACTION

To: (Defendant's name and address) Annette L. Hayes, U.S. Attorney
Western District of Washington
700 Stewart Street, Suite 5220
Seattle, WA 98101

A lawsuit has been filed against you.

Within 21 days after service of this summons on you (not counting the day you received it) — or 60 days if you
are the United States or a United States agency, or an officer or employee of the United States described in Fed. R. Civ.
P. 12 (a)(2) or (3) — you must serve on the plaintiff an answer to the attached complaint or a motion under Rule 12 of
the Federal Rules of Civil Procedure. The answer or motion must be served on the plaintiff or plaintiff's attorney,
whose name and address are:

Jeremy C. Lieb
Erik Grafe
EARTHJUSTICE
441 W 5th Avenue, Suite 301
Anchorage, AK 99501

Kristen L. Boyles
EARTHJUSTICE
705 Second Avenue, Suite 203
Seattle, WA 98104

If you fail to respond, judgment by default will be entered against you for the relief demanded in the complaint.
You also must file your answer or motion with the court.

CLERK OF COURT

Date:

Signature of Clerk or Deputy Clerk

Civil Action No. 2:18-cv-01803

PROOF OF SERVICE

(This section should not be filed with the court unless required by Fed. R. Civ. P. 4 (l))

This summons for *(name of individual and title, if any)* _____
was received by me on *(date)* _____.

I personally served the summons on the individual at *(place)* _____
_____ on *(date)* _____; or

I left the summons at the individual's residence or usual place of abode with *(name)* _____
_____, a person of suitable age and discretion who resides there,
on *(date)* _____, and mailed a copy to the individual's last known address; or

I served the summons on *(name of individual)* _____, who is
designated by law to accept service of process on behalf of *(name of organization)* _____
_____ on *(date)* _____; or

I returned the summons unexecuted because _____; or

Other *(specify)*:

My fees are \$ _____ for travel and \$ _____ for services, for a total of \$ _____ 0.00 _____.

I declare under penalty of perjury that this information is true.

Date: _____

Server's signature

Printed name and title

Server's address

Additional information regarding attempted service, etc: