SUPPLEMENTAL INFORMATION

A total of 11 field tests were conducted with the fog-and-tube scrubber apparatus (Table S1). Tests 1-4 were "continuous treatment" tests that included two separate trial periods: a control period with the fogger turned off for a total of 2 consecutive hours, and a treatment period with the fogger turned on for a total of 2 consecutive hours. Tests 5-11 were "periodic treatment" tests, conducted by cycling between fog-off and fog-on cases on 20 minute intervals.

Table S1. Summary of conditions for the 11 field tests conducted in the study mine.

Test	Fog treatment	Diesel vehicle	Scaling Factor, S	Average Water Consumption, Q (cm3/s)	Average Droplet Concentration, C_d (#/cm^3)	Average particle concentration, C_p (#/cm^3)			
						Inlet (Control)	Inlet (Fog)	Outlet (Control)	Outlet (Fog)
1	Continuous	Buggy	0.931	1.083	3.68E+05	3.47E+05	3.81E+05	3.17E+05	1.13E+05
2	Continuous	Long Bus	1.022	0.817	2.66E+05	5.08E+05	4.32E+05	4.97E+05	1.75E+05
3	Continuous	Short Bus	0.974	0.650	2.21E+05	2.11E+05	3.21E+05	2.19E+05	1.44E+05
4	Continuous	Roxor Mine Jeep	1.031	0.700	2.38E+05	7.68E+05	1.16E+06	9.34E+05	2.48E+05
5	Periodic	Long Bus	1.03	0.733	2.47E+05	3.53E+05	3.54E+05	3.16E+05	1.64E+05
6	Periodic	Short Bus	0.989	0.750	2.53E+05	9.05E+05	7.78E+05	7.82E+05	3.40E+05
7	Periodic	Buggy	1.001	0.817	2.77E+05	3.38E+05	3.70E+05	2.51E+05	8.72E+04
8	Periodic	Short Bus	1.01	0.750	2.66E+05	2.28E+05	2.59E+05	2.26E+05	1.33E+05
9	Periodic	Buggy	1.011	0.617	2.49E+05	8.04E+04	7.84E+04	6.34E+04	6.23E+04
10	Periodic	Buggy	1.011	0.617	2.06E+05	7.91E+05	7.92E+05	6.93E+05	2.19E+05
11	Periodic	Brown Truck	0.9935	0.550	1.84E+05	9.93E+05	9.90E+05	8.10E+05	3.59E+05

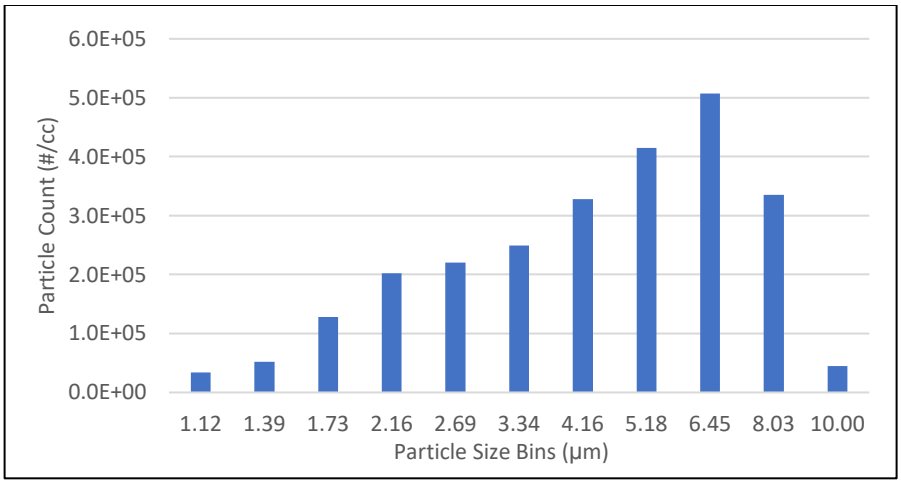

Fig. S1. Fog droplet size distribution based on laboratory data collected using the OPS

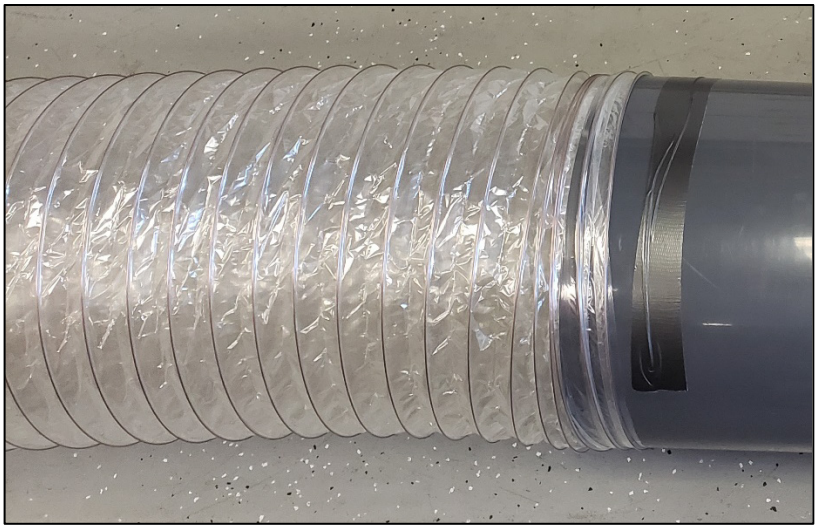

Fig. S2. Photograph of the Mylar tubing used to construct the fog-and-tube scrubber apparatus.

Table S2. Inlet and outlet particle number concentrations by bin and resulting particle removal efficiency, E, for each field test. The outlet concentrations shown here for each test were corrected by multiplying the measured concentrations by the scaling factor shown in Table S1.

Test			Particle size bin (nm)										
			11.5	15.4	20.5	27.8	36.5	48.7	65.9	86.6	115.5	154	Total
1	Fog ON	Inlet	3.53E+04	4.85E+04	3.81E+04	5.61E+04	5.94E+04	4.86E+04	3.54E+04	2.84E+04	2.11E+04	1.03E+04	3.81E+05
		Outlet	1.52E+03	1.85E+03	2.71E+03	7.31E+03	1.17E+04	1.58E+04	1.87E+04	1.92E+04	1.53E+04	8.05E+03	1.13E+05
		E	***96%***	***96%***	***93%***	***87%***	***80%***	***68%***	***47%***	***32%***	***27%***	***22%***	***70%***
	Fog OFF	Inlet	2.66E+04	4.43E+04	4.04E+04	5.52E+04	5.52E+04	4.33E+04	3.07E+04	2.43E+04	1.81E+04	8.79E+03	3.47E+05
		Outlet	1.33E+04	2.90E+04	3.35E+04	4.84E+04	5.01E+04	4.20E+04	3.20E+04	2.58E+04	1.86E+04	8.76E+03	3.01E+05
		E	***50%***	***35%***	***17%***	***12%***	***9%***	***3%***	***-4%***	***-6%***	***-3%***	***0%***	***13%***
2	Fog ON	Inlet	1.74E+03	3.08E+03	2.27E+04	6.43E+04	8.78E+04	8.82E+04	7.21E+04	5.21E+04	3.02E+04	1.02E+04	4.32E+05
		Outlet	3.09E+03	1.57E+03	1.55E+03	1.14E+04	2.29E+04	3.15E+04	3.42E+04	3.07E+04	2.14E+04	9.92E+03	1.75E+05
		E	***-78%***	***49%***	***93%***	***82%***	***74%***	***64%***	***53%***	***41%***	***29%***	***3%***	***60%***
	Fog OFF	Inlet	4.35E+03	4.18E+03	2.64E+04	8.42E+04	1.17E+05	1.14E+05	8.37E+04	4.92E+04	2.02E+04	4.41E+03	5.08E+05
		Outlet	4.90E+03	1.32E+03	1.53E+04	6.62E+04	1.04E+05	1.11E+05	8.88E+04	5.55E+04	2.30E+04	3.22E+03	4.73E+05
		E	***-13%***	***69%***	***42%***	***21%***	***11%***	***3%***	***-6%***	***-13%***	***-14%***	***27%***	***7%***
3	Fog ON	Inlet	2.13E+03	6.16E+03	3.09E+04	5.99E+04	6.59E+04	5.54E+04	3.96E+04	2.89E+04	2.03E+04	1.21E+04	3.21E+05
		Outlet	2.85E+03	1.67E+03	2.89E+03	1.33E+04	2.06E+04	2.30E+04	2.16E+04	1.90E+04	1.48E+04	9.13E+03	1.44E+05
		E	***-34%***	***73%***	***91%***	***78%***	***69%***	***58%***	***45%***	***34%***	***27%***	***25%***	***55%***
	Fog OFF	Inlet	4.69E+03	5.84E+03	1.06E+04	3.33E+04	4.51E+04	4.28E+04	3.04E+04	1.85E+04	1.14E+04	8.05E+03	2.11E+05
		Outlet	1.46E+03	3.32E+03	1.15E+04	3.08E+04	4.03E+04	3.76E+04	2.74E+04	1.78E+04	1.05E+04	5.94E+03	1.87E+05
		E	***69%***	***43%***	***-8%***	***7%***	***11%***	***12%***	***10%***	***4%***	***8%***	***26%***	***11%***
4	Fog ON	Inlet	1.64E+05	2.94E+05	1.78E+05	1.32E+05	9.74E+04	7.20E+04	6.43E+04	6.79E+04	5.87E+04	3.15E+04	1.16E+06
		Outlet	1.02E+03	8.78E+03	1.40E+04	1.78E+04	1.95E+04	2.41E+04	3.14E+04	3.69E+04	3.29E+04	1.95E+04	2.48E+05
		E	***99%***	***97%***	***92%***	***86%***	***80%***	***67%***	***51%***	***46%***	***44%***	***38%***	***79%***
	Fog OFF	Inlet	1.74E+05	1.63E+05	3.49E+04	4.56E+04	6.26E+04	6.22E+04	6.13E+04	6.81E+04	6.13E+04	3.46E+04	7.68E+05
		Outlet	2.23E+04	1.06E+05	1.22E+05	1.01E+05	6.35E+04	4.34E+04	5.03E+04	6.77E+04	6.58E+04	3.88E+04	6.81E+05
		E	***87%***	***35%***	***-249%***	***-122%***	***-2%***	***30%***	***18%***	***1%***	***-7%***	***-12%***	***11%***
5	Fog ON	Inlet	1.72E+03	7.69E+03	2.80E+04	5.92E+04	7.30E+04	6.83E+04	5.24E+04	3.59E+04	2.04E+04	7.90E+03	3.54E+05
		Outlet	3.73E+03	3.10E+03	4.02E+03	1.53E+04	2.51E+04	2.92E+04	2.75E+04	2.24E+04	1.48E+04	7.03E+03	1.64E+05
		E	***-117%***	***60%***	***86%***	***74%***	***66%***	***57%***	***47%***	***38%***	***27%***	***11%***	***54%***
	Fog OFF	Inlet	2.93E+03	8.13E+03	2.59E+04	5.91E+04	7.51E+04	7.00E+04	5.18E+04	3.34E+04	1.83E+04	8.80E+03	3.53E+05
		Outlet	2.95E+03	3.37E+03	1.39E+04	4.54E+04	6.52E+04	6.52E+04	5.02E+04	3.19E+04	1.55E+04	5.26E+03	2.99E+05
		E	***0%***	***59%***	***46%***	***23%***	***13%***	***7%***	***3%***	***5%***	***15%***	***40%***	***15%***
6	Fog ON	Inlet	1.06E+04	1.90E+04	5.13E+04	1.16E+05	1.53E+05	1.52E+05	1.22E+05	8.27E+04	4.83E+04	2.30E+04	7.78E+05
		Outlet	7.14E+03	4.66E+03	4.24E+03	2.46E+04	4.77E+04	6.22E+04	6.32E+04	5.27E+04	3.43E+04	1.51E+04	3.40E+05
		E	***33%***	***76%***	***92%***	***79%***	***69%***	***59%***	***48%***	***36%***	***29%***	***35%***	***56%***
		Inlet	1.24E+04	1.90E+04	5.11E+04	1.34E+05	1.89E+05	1.93E+05	1.50E+05	9.26E+04	4.44E+04	2.05E+04	9.05E+05

	Fog OFF	Outlet	6.65E+03	4.21E+03	2.46E+04	9.42E+04	1.49E+05	1.63E+05	1.39E+05	9.57E+04	4.87E+04	1.39E+04	7.39E+05
		E	***46%***	***78%***	***52%***	***30%***	***21%***	***15%***	***7%***	***-3%***	***-10%***	***32%***	***18%***
7	Fog ON	Inlet	5.46E+04	7.67E+04	4.49E+04	4.70E+04	4.37E+04	3.27E+04	2.32E+04	2.02E+04	1.71E+04	9.95E+03	3.70E+05
		Outlet	4.17E+03	4.41E+03	2.82E+03	5.61E+03	8.89E+03	6.82E+03	1.20E+04	1.26E+04	1.16E+04	7.93E+03	8.72E+04
		E	***92%***	***94%***	***94%***	***88%***	***80%***	***79%***	***48%***	***38%***	***32%***	***20%***	***76%***
	Fog OFF	Inlet	5.38E+04	6.65E+04	3.54E+04	4.15E+04	4.11E+04	3.11E+04	2.18E+04	1.94E+04	1.69E+04	1.02E+04	3.38E+05
		Outlet	1.62E+04	3.02E+04	2.76E+04	3.37E+04	3.16E+04	2.43E+04	1.82E+04	1.63E+04	1.41E+04	8.99E+03	2.21E+05
		E	***70%***	***55%***	***22%***	***19%***	***23%***	***22%***	***17%***	***16%***	***16%***	***12%***	***34%***
8	Fog ON	Inlet	2.36E+03	7.59E+03	1.87E+04	3.84E+04	4.95E+04	4.85E+04	3.90E+04	2.79E+04	1.72E+04	9.48E+03	2.59E+05
		Outlet	4.17E+03	4.09E+03	2.57E+03	7.41E+03	1.19E+04	1.55E+04	1.81E+04	1.93E+04	1.67E+04	1.05E+04	1.33E+05
		E	***-76%***	***46%***	***86%***	***81%***	***76%***	***68%***	***54%***	***31%***	***3%***	***-11%***	***49%***
	Fog OFF	Inlet	1.95E+03	5.90E+03	1.63E+04	3.45E+04	4.30E+04	4.10E+04	3.28E+04	2.50E+04	1.70E+04	1.03E+04	2.28E+05
		Outlet	1.42E+03	2.79E+03	8.99E+03	2.44E+04	3.26E+04	3.24E+04	2.72E+04	2.16E+04	1.55E+04	9.12E+03	1.76E+05
		E	***27%***	***53%***	***45%***	***29%***	***24%***	***21%***	***17%***	***14%***	***9%***	***12%***	***23%***
9	Fog ON	Inlet	4.53E+03	5.70E+03	3.48E+03	5.13E+03	6.18E+03	7.58E+03	1.01E+04	1.28E+04	1.31E+04	9.81E+03	7.84E+04
		Outlet	2.31E+03	3.08E+03	2.08E+03	3.33E+03	4.44E+03	6.07E+03	8.54E+03	1.11E+04	1.18E+04	9.63E+03	6.23E+04
		E	***49%***	***46%***	***40%***	***35%***	***28%***	***20%***	***15%***	***14%***	***10%***	***2%***	***20%***
	Fog OFF	Inlet	5.19E+03	6.62E+03	3.88E+03	5.26E+03	6.30E+03	7.72E+03	1.02E+04	1.28E+04	1.29E+04	9.59E+03	8.04E+04
		Outlet	2.64E+03	3.58E+03	2.32E+03	3.41E+03	4.52E+03	6.19E+03	8.63E+03	1.11E+04	1.16E+04	9.41E+03	6.34E+04
		E	***49%***	***46%***	***40%***	***35%***	***28%***	***20%***	***15%***	***14%***	***10%***	***2%***	***21%***
10	Fog ON	Inlet	9.20E+03	7.45E+04	1.49E+05	2.31E+05	2.00E+05	1.01E+05	1.30E+04	2.81E+02	2.27E+03	1.09E+04	7.92E+05
		Outlet	4.84E+03	5.11E+03	1.48E+04	4.21E+04	4.89E+04	3.63E+04	1.76E+04	7.71E+02	4.69E+03	4.70E+03	2.19E+05
		E	***47%***	***93%***	***90%***	***82%***	***76%***	***64%***	***-35%***	***-175%***	***-107%***	***57%***	***72%***
	Fog OFF	Inlet	1.12E+04	8.30E+04	1.54E+05	2.24E+05	1.87E+05	9.07E+04	1.14E+04	4.15E+03	9.17E+03	1.61E+04	7.91E+05
		Outlet	3.95E+03	3.11E+04	8.46E+04	1.66E+05	1.66E+05	1.04E+05	3.08E+04	2.94E+03	4.18E+03	6.37E+03	6.00E+05
		E	***65%***	***63%***	***45%***	***26%***	***11%***	***-14%***	***-170%***	***29%***	***54%***	***60%***	***24%***
11	Fog ON	Inlet	2.31E+04	8.40E+04	1.35E+05	2.19E+05	2.22E+05	1.61E+05	8.44E+04	3.81E+04	1.63E+04	6.68E+03	9.90E+05
		Outlet	4.57E+03	1.51E+04	3.07E+04	5.90E+04	6.71E+04	5.73E+04	4.05E+04	2.79E+04	1.74E+04	7.50E+03	3.59E+05
		E	***80%***	***82%***	***77%***	***73%***	***70%***	***64%***	***52%***	***27%***	***-7%***	***-12%***	***64%***
	Fog OFF	Inlet	2.74E+04	9.75E+04	1.49E+05	2.26E+05	2.17E+05	1.47E+05	7.04E+04	3.09E+04	1.67E+04	9.90E+03	9.93E+05
		Outlet	7.94E+03	3.97E+04	8.54E+04	1.61E+05	1.75E+05	1.35E+05	7.69E+04	3.80E+04	1.55E+04	4.19E+03	7.39E+05
		E	***71%***	***59%***	***43%***	***29%***	***19%***	***8%***	***-9%***	***-23%***	***7%***	***58%***	***26%***

Table S3. Simulated R_v and corresponding V_{dep_d} values for smooth wall, lower fitted, and higher fitted cases for all tests.

	Smooth Wall Case		Lower Fitted		Higher Fitted	
Test	R_v	V_{dep_d} (cm/s)	R_v	V_{dep_d} (cm/s)	R_v	$V_{dep\_}$ (cm/s)
1	1	3.43E-08	6.12E+06	0.21	4.18E+07	1.44
2	1	3.43E-08	5.53E+06	0.19	2.61E+07	0.90
3	1	3.43E-08	4.66E+06	0.16	3.22E+07	1.11
4	1	3.43E-08	9.90E+06	0.34	2.72E+07	0.93
5	1	3.43E-08	4.08E+06	0.14	3.65E+07	1.25
6	1	3.43E-08	4.66E+06	0.16	3.20E+07	1.10
7	1	3.43E-08	8.16E+06	0.28	3.28E+07	1.13
8	1	3.43E-08	3.50E+06	0.12	4.40E+07	1.51
10	1	3.43E-08	6.12E+06	0.21	3.49E+07	1.20
11	1	3.43E-08	5.53E+06	0.19	3.20E+07	1.10

Table S4. Simulated E values by particle bin size using the measured inlet conditions during the fog treatment for each field test and the lower fitted R_v values from Table S3. The total E values shown here necessarily match those derived from the experimental data shown in Table S2.

	Lower fitted V_{dep_d}	E (%) Particle size bin (nm)										
Test	(cm/s)	11.5	15.4	20.5	27.8	36.5	48.7	65.9	86.6	115.5	154	Total
1	0.21	80	80	79	78	77	72	62	49	36	25	***70***
2	0.19	76	76	76	74	71	64	52	39	27	19	***60***
3	0.16	71	71	70	68	65	57	45	33	23	15	***55***
4	0.34	91	91	91	89	83	71	54	38	26	17	***79***
5	0.14	67	67	66	65	62	55	45	34	24	16	***54***
6	0.16	71	71	70	69	66	59	48	36	25	17	***56***
7	0.28	87	87	86	85	82	73	58	43	30	20	***76***
8	0.12	62	62	61	60	58	52	43	33	23	16	***49***
10	0.21	79	79	78	76	71	61	47	32	23	15	***72***
11	0.19	76	76	75	72	67	57	42	30	20	13	***64***