



November 6, 2013

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**RE: Colorado Air Monitoring Plan for PM<sub>2.5</sub> and NO<sub>2</sub>**

Dear Ms. Rudolph and Mr. Allison,

We are writing on behalf of the communities who live, work, play, and send their children to attend school near the intersection of I-70 and I-25 (“the mousetrap”) in response to a message from Will Allison regarding the potential location of highway-oriented air monitors for fine particulate matter (PM<sub>2.5</sub>) and nitrogen dioxide (NO<sub>2</sub>).<sup>1</sup> Close proximity to the two major highways has resulted in environmental, social, economic, and physical deterioration of the surrounding neighborhoods of Elyria, Swansea and Globeville. These communities also face higher incidence and severity of adverse health risks resulting from increased exposure to harmful air pollutants.

The current air monitoring network in Denver fails to adequately measure population exposures to elevated concentrations of NO<sub>2</sub> and PM<sub>2.5</sub> in communities adjacent to I-70 and I-25 in the vicinity of the mousetrap. The monitoring site selected for the first highway-oriented NO<sub>2</sub> monitor near I-25 and 8<sup>th</sup> Avenue has significantly less vehicle traffic than the combined annual average daily traffic (AADT) from both I-25 and I-70 at the mousetrap. EPA’s near highway monitoring criteria and the statutory requirement that all geographic areas of the state attain the National Ambient Air Quality Standards (NAAQS) require that air agencies site monitors to ensure that all communities located adjacent to highways will be protected by attainment of the NAAQS. The current NO<sub>2</sub> monitor location near I-25 and 8<sup>th</sup> Avenue is not representative of the higher traffic, highway emissions and community exposures occurring at the mousetrap. Our groups respectfully request CDPHE place an air monitoring station at the mousetrap to fulfill the

requirements of the Clean Air Act.

Communities near the mousetrap are severely impacted by air quality

The neighborhood of Globeville is bisected by I-70 and I-25. More than 80 percent of the nearly 4,000 residents are of Hispanic origin.<sup>ii</sup> The Globeville neighborhood poverty rate is over 23 percent, well above the Denver and national averages. There are two schools in Globeville – Garden Place Elementary School and Laradon Hall, a private institution that provides services to children and adults with developmental disabilities.<sup>iii</sup>

The Elyria and Swansea neighborhoods are also bisected by I-70 near the mousetrap. Elyria and Swansea have a population just over 6,000, with more than 80 percent being Latino. Nearly 28 percent of residents live in poverty.<sup>iv</sup> Swansea Elementary School serves both neighborhoods and is one of two elementary schools in Denver that is within 500 feet of a major freeway, the distance at which health effects are most acute.<sup>v</sup>

These neighborhoods are also within the Children’s Corridor, a geographic area so strongly associated with high numbers of at-risk children that it is the center of a campaign by the Piton Foundation to make the neighborhoods more visible and actionable to the community.<sup>vi</sup>

The 2013 Health Disparities Report, conducted by CDPHE, looked at the race/ethnicity of individuals who live within 500 feet of I-70 on the section that runs east from the mousetrap through these neighborhoods. The Department selected the section of I-70 “because it’s one of the most heavily traveled highways in the state with up to 139,000 vehicles per day, almost seven times the 20,000 vehicle threshold determined to be dangerous.” The study found that 79 percent of individuals living within 500 feet of this section of I-70 are Hispanic/Latino, compared with only 21 percent statewide.<sup>vii</sup>

These three neighborhoods suffer from some of the worst air in the state. More than half a million pounds of toxics were released into the air in Globeville, Swansea, and Elyria in 2012, according to EPA’s Toxics Release Inventory – more than any other zip code in Colorado, and more than 20 percent of the state’s total toxic air releases.<sup>viii</sup> Denver County as a whole suffers from some of the worst diesel particulate pollution in the entire nation – ranking 9<sup>th</sup> out of the 3,109 counties nationwide. The lifetime cancer risk from diesel soot in Denver exceeds the risk of all other air toxics tracked by EPA. Diesel soot is a major component of PM<sub>2.5</sub> near highways, and is a major source of the health risks linked to breathing fine particles. The average lifetime diesel soot cancer risk for a resident of Denver County is 1 in 1,938, which is *516 times greater* than the EPA’s acceptable cancer level of 1 in a million.<sup>ix</sup> Much of this diesel pollution is likely concentrated at the mousetrap, where Colorado’s two largest highways intersect.

State Monitoring Plan Required Under the Clean Air Act

State or local agencies are required under 40 CFR Section 58 to submit an annual monitoring network plan for “the establishment and maintenance of an air quality surveillance system that consists of a network of [State or Local Air Monitoring Systems (“SLAMS”)].”<sup>x</sup> The monitoring plan is required to include “a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements stated in appendices A, C, D, and E.”<sup>xi</sup> Appendix D addresses criteria for assembling monitoring networks. Appendix E addresses specific criteria for the location of monitoring sites.

Appendix D of Part 58 details “monitoring objectives and general criteria to be applied in establishing the required SLAMS ambient air quality monitoring stations and for choosing general locations for additional monitoring sites.”<sup>xii</sup> The three criteria for monitoring networks are: “(a) Provide air pollution data to the general public in a timely manner... (b) Support compliance with ambient air quality standards and emissions strategy development... (c) Support for air pollution research studies...”<sup>xiii</sup> “Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources.”<sup>xiv</sup>

Of particular concern to the communities located in the vicinity of the mousetrap are the requirements that the monitoring plan include—

- (a) Sites located to determine the highest concentrations expected to occur in the area covered by the network;
- (b) Sites located to measure typical concentrations in areas of high population density;
- (c) Sites located to determine the impact of significant sources or source categories on air quality.<sup>xv</sup>

The facts that 1) the mousetrap includes the highest concentration of vehicle traffic in the state, and therefore the greatest emissions of mobile source related pollutants, and 2) that these neighborhoods are also in close proximity to a large, multi-unit coal-fired power plant<sup>xvi</sup>, two oil refineries, the Purina Mill and other large industrial sources of emissions, strongly suggests that the mousetrap is likely the location with “the highest concentrations expected to occur in the [Denver CBSA] covered by the network.” The fact that CDPHE measures the highest PM concentrations in the Denver PM maintenance area at the Commerce City monitor, which is sited as a regional scale monitor not near a major highway, confirms that this north metro area is exposed to the worst PM levels linked to stationary sources. When additional concentrations attributable to mobile source emissions are added at the mousetrap, total exposures to PM<sub>2.5</sub> must be highest at the mousetrap location. For this reason, EPA’s network criteria require that a monitor be located to ensure attainment in these mousetrap communities.

#### Near highway monitors are needed to better characterize community exposures

Studies have shown that people who live, work, or attend school near major highways have an increased incidence and severity of health problems including reduced lung

function and impaired development in children, asthma, cardiovascular disease, low birth weight, and pre-term newborns, and premature death.<sup>xvii</sup>

Historically, air quality monitors were placed in areas away from highways because they were intended to measure air pollution across entire regions to determine compliance with state and federal air standards. As a result, many current monitoring stations significantly underestimate the harmful exposures in neighborhoods near highways.

In the 2011 update to the NAAQS for NO<sub>2</sub>, EPA recognized that highway-associated exposures account for a majority of ambient exposures to peak NO<sub>2</sub> concentrations. In particular, the EPA recognized that the combination of increased mobile source emissions and increased urban population densities lead to increased potential for exposure and associated risks.<sup>xviii</sup> And in the 2012 proposal to update the PM NAAQS for fine particles less than 2.5 micrometers in diameter, EPA states its belief “that there are gradients in near-roadway PM<sub>2.5</sub> that are most likely to be associated with heavily travelled roads, particularly those with significant heavy-duty diesel activity...”<sup>xix</sup>

To supplement the long-standing requirement of Part 58 that States include monitoring sites at locations to measure the expected highest concentrations in an area, the EPA added requirements for near-road monitors in urban areas near heavily trafficked highways to “better understand the potential health impacts of these exposures.”<sup>xx</sup> The Agency further explained that “a number of key monitoring objectives will be supported, including collection of NAAQS comparable data in the near-road environment, support for long-term health studies investigating adverse effects on people, providing a better understanding of pollutant gradients impacting neighborhoods that parallel major roads, availability of data to validate performance of models simulating near-road dispersion, characterization of areas with potentially elevated concentrations and/or poor air quality...”<sup>xxi</sup> and others.

Federal near roadway monitoring rules, beginning in January 2014, require states to add new monitors within 50 meters of major highways to measure NO<sub>2</sub>, PM<sub>2.5</sub> and carbon monoxide (CO). To achieve the health protection objectives of the Clean Air Act, these monitors must be placed at sites with the expected highest highway emissions and therefore the highest exposures to highway emissions. Only then will the data collected be able to fulfill the important monitoring objectives laid out by EPA above, and ensure that air quality will attain the NAAQS in all communities exposed to the elevated pollution levels associated with highway emissions.

#### Denver near highway air monitors required under the Clean Air Act

In February 2010, EPA strengthened the NAAQS for NO<sub>2</sub>. As part of the revisions, EPA requires microscale near-road NO<sub>2</sub> monitors in urban areas near heavily trafficked highways where peak 1-hour NO<sub>2</sub> concentrations are expected to occur. With a Core Based Statistical Area (CBSA) population of 2,500,000 or more persons, Denver is required to have two near-road NO<sub>2</sub> monitors. The rule requires the first monitor to be operational by January 1, 2014 and the second monitor to be reflected in the state Annual

Monitoring Network Plan submitted July 1, 2014, with the monitor operational by January 1, 2015.<sup>xxii</sup>

EPA also issued a decision in 2011, as part of the NAAQS for carbon monoxide, to require one CO monitor to be collocated with one NO<sub>2</sub> near road monitor. Based on its CBSA, Denver is required to have its near road CO monitor operational by January 1, 2015 at either of the required NO<sub>2</sub> stations.<sup>xxiii</sup>

In December 2012, EPA strengthened the NAAQS for PM<sub>2.5</sub>, requiring near highway monitors at one location in each urban area with a population of 1 million or more. The PM<sub>2.5</sub> monitors will be collocated at near-road monitoring sites also measuring NO<sub>2</sub> and CO. Denver is required to have a PM monitoring station operational by January 1, 2015.<sup>xxiv</sup>

#### Near highway NO<sub>2</sub> monitoring criteria apply to PM<sub>2.5</sub> monitor siting

In the final PM NAAQS rule, EPA requires one near-road PM<sub>2.5</sub> monitor to be collocated at a planned near-road NO<sub>2</sub> station.<sup>xxv</sup> EPA explains that “the NO<sub>2</sub> network design considers multiple factors that are also relevant for PM<sub>2.5</sub> concentrations (i.e., average annual daily traffic, fleet mix, roadway design, congestion patterns, terrain, and meteorology) and significant thought and review has already gone into its design, including pilot studies at five locations, and the development of a technical assistance document in conjunction with the affected monitoring agencies and the CASAC AAMMS (Russell and Samet, 2010b) to support deployment.”<sup>xxvi</sup>

Therefore, the design criteria in 40 CFR Section 58, Appendix D, ¶ 4.3, “Requirement for Near-road NO<sub>2</sub> Monitors,” also apply to near highway PM<sub>2.5</sub> monitors.

4.3.2(a)(1) The near-road NO<sub>2</sub> monitoring stations shall be selected by ranking all road segments within a CBSA by AADT and then identifying a location or locations adjacent to those highest ranked road segments, considering fleet mix, roadway design, congestion patterns, terrain, and meteorology, *where maximum hourly NO<sub>2</sub> concentrations are expected to occur* and siting criteria can be met in accordance with appendix E of this part. Where a State or local air monitoring agency identifies multiple acceptable candidate sites where maximum hourly NO<sub>2</sub> concentrations are expected to occur, the monitoring agency shall *consider the potential for population exposure in the criteria utilized to select the final site location*. Where one CBSA is required to have two near-road NO<sub>2</sub> monitoring stations, the sites shall be differentiated from each other by one or more of the following factors: fleet mix; congestion patterns; terrain; geographic area within the CBSA; or different route, interstate, or freeway designation. [Emphasis added.]

Moreover, in the final PM NAAQS rule EPA stated that, “To the extent that air agencies are still determining the optimum location for their multi-pollutant near-road monitoring

stations, *EPA encourages consideration of sites that best reflect measurement of maximum concentrations associated with exposure of people living in areas that parallel major roads*, to maximize the value of the data for use later in health studies.<sup>xxvii</sup>  
[Emphasis added.]

In both of these provisions, EPA reiterates the importance of selecting sites *where maximum hourly concentrations are expected to occur*. And EPA specifically states that these criteria apply to the siting of both NO<sub>2</sub> and PM<sub>2.5</sub> monitors.

### CDPHE should place second NO<sub>2</sub> monitor and PM monitor at the mousetrap

Based on the criteria outlined above, CDPHE is required to choose a near road NO<sub>2</sub> and PM monitoring site that prioritizes AADT, hourly concentrations and population exposure. It is clear that the mousetrap is the appropriate location to place Denver's second NO<sub>2</sub> monitor and the near road PM monitor.

CDPHE recently placed a near-highway monitoring site near I-25 and 8<sup>th</sup> Avenue, about 15 meters from I-25. CDPHE stated that the site is predominantly for NO<sub>2</sub>, but will soon begin collecting both PM<sub>2.5</sub> and PM<sub>10</sub> data.<sup>xxviii</sup> CDPHE also stated that it used EPA's Technical Assistance Document for near-road monitoring and the chosen road segment ranked the highest based on a weighted annual average traffic volume. According to CDPHE, highway segments on I-25 near the mousetrap ranked just below, and road segments along I-70 were quite a bit lower.<sup>xxix</sup> However, CDPHE did not look at the cumulative AADT at the mousetrap.

The AADT along I-25 at 8<sup>th</sup> Avenue is only 249,000, as reported on the spreadsheet provided by Mr. Allison, whereas at the mousetrap the total trips passing through the interchange are 326,000, more than 30 percent more traffic. Traffic counts reported by CDOT for 2012 show AADT at the mousetrap as (truck share shown in parenthesis):<sup>xxx</sup>

I-25 south of interchange: 243,000 (9.1%)  
I-25 north of interchange: 198,000 (10.9%)  
I-70 west of interchange: 150,000 (9.1%)  
I-70 east of interchange: 140,000 (9.3%)

Especially important is the fact that the share of AADT represented by truck trips at the mousetrap is much higher than at the current NO<sub>2</sub> monitoring site. CDOT's data show that approximately 40 percent more truck trips use the I-25 segments north and south of the mousetrap than at 8<sup>th</sup> Avenue.

Together, the higher AADT and the greater number of truck trips show that the mousetrap is the location in the Denver CBSA where mobile source emissions are the highest. Concentrations of NO<sub>2</sub> and PM<sub>2.5</sub> measured at the current monitor location will not be representative of concentrations occurring within the neighborhoods adjacent to the mousetrap. To satisfy the requirements of EPA's Appendix D that near-highway monitors be located *where maximum hourly NO<sub>2</sub> concentrations are expected to occur*,

and to ensure that attainment is being demonstrated throughout the entire geographic area of the State, as required by CAA section 107(a), the second NO<sub>2</sub> monitor and the PM<sub>2.5</sub> monitor must be located at the mousetrap.

The air quality data provided by Mr. Allison from the monitor located at the Swansea Elementary School does not justify a different result. Mr. Allison stated that there was a monitor on the roof of the Swansea Elementary School from 2005-2012 but it was removed because it “did not show concentrations materially different than our downtown monitor (called CAMP and located at 2105 Broadway).”<sup>xxxix</sup> However, the Swansea School is located nearly 2 miles east of the mousetrap at a location where CDOT shows only 140,000 trips per day. AADT at the school is 186,000 less than at the mousetrap. These concentration data suggest that measurements at the mousetrap, within the 50-meter zone required by EPA, will be significantly higher than at the Swansea school site. The fact that the Swansea site was as high as at the CAMP station even though AADT is much lower than at the mousetrap demonstrates why a monitor must be located at the mousetrap to meet EPA’s criteria for the monitoring network and to protect residents in the nearby neighborhoods, including those who attend the Swansea School.

CDOT currently operates a secure met station with access to power at the mousetrap, which would make it relatively easy and cost-effective for CDPHE to install air monitors at this location as well.

Should CDPHE choose not to site the second NO<sub>2</sub> monitor at the mousetrap, we request that the Department still place a PM monitor at the mousetrap as authorized by EPA: “While only a single near-road PM<sub>2.5</sub> monitor is required within each of the CBSAs, agencies may elect to add additional PM<sub>2.5</sub> monitoring sites in near-road environments.”<sup>xxxix</sup>

#### Proximity to stationary sources is not a reason for rejecting mousetrap site

Mr. Allison stated in a meeting with community representatives on September 30 that the mousetrap location had been rejected for citing the first NO<sub>2</sub> monitor because of the possibility that the impact of emissions from the highways could be confounded by emissions from the Cherokee Power Plant and other local stationary sources, and that responsibility for NAAQS violations could not be clearly attributed to mobile versus industrial sources. However, EPA clearly states in the final PM NAAQS rule that “continuous PM<sub>2.5</sub> FEMs, which provide mass concentration data on an hourly basis, are better suited to accomplish the goals of near-road monitoring as they will complement the time resolution of the other air quality measurements and traffic data collected at the same sites. In this regard, particular PM<sub>2.5</sub> FEMs are better suited for near-road monitoring than FRMs.”<sup>xxxix</sup>

At the mousetrap, such hourly data can be combined with wind direction data from the met station to clearly distinguish the contribution from stationary sources from the concentrations contributed by highway emissions.

CDPHE should act quickly to submit a revised monitoring plan

CDPHE is required to submit to EPA a revised monitoring plan that includes the new highway-oriented monitoring stations no later than July 1, 2014. However, we urge the Department to act more quickly to get a PM<sub>2.5</sub> monitor in place at the mousetrap. The sooner data is collected from this site, the sooner the community can be assured that air quality is attaining national health standards, or that remedial action might be necessary to protect the residents and children attending the schools in close proximity to the mousetrap.

Thank you for considering our concerns and recommendations.  
If you have any questions, please do not hesitate to contact Vickie Patton at (303) 447-7215 or [vpatton@edf.org](mailto:vpatton@edf.org).

Respectfully submitted,

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<sup>i</sup> Email from Will Allison, CDPHE, to Thad Tecza dated October 4, 2013.

<sup>ii</sup> Denver Department of Planning & Community Development, “Globeville Assessment,” January 2008, Page 18-20.

<sup>iii</sup> Globeville Assessment, page 53.

<sup>iv</sup> Piton Foundation website, Elyria Swansea Neighborhood Summary, available at: [http://www.piton.org/?fuseaction=CommunityFacts.Summary&Neighborhood\\_ID=885](http://www.piton.org/?fuseaction=CommunityFacts.Summary&Neighborhood_ID=885) (last accessed on October 14, 2013).

<sup>v</sup> CDPHE, Health Disparities Report (2013). Available online at: [http://www.colorado.gov/cs/Satellite?c=Document\\_C&childpagename=CDPHE-Main%2FDocument\\_C%2FCBONAddLinkView&cid=1251647411145&pagename=CBONWrap\\_per](http://www.colorado.gov/cs/Satellite?c=Document_C&childpagename=CDPHE-Main%2FDocument_C%2FCBONAddLinkView&cid=1251647411145&pagename=CBONWrap_per) (last accessed October 30, 2013).

<sup>vi</sup> Piton Foundation website at: [www.denverchildrenscorridor.org](http://www.denverchildrenscorridor.org) (last accessed October 30, 2013).

<sup>vii</sup> CDPHE, Health Disparities Report (2013).

<sup>viii</sup> EPA’s TRI website at: <http://www2.epa.gov/toxics-release-inventory-tri-program> using zip code 80216.

<sup>ix</sup> Clean Air Task Force website, Diesel Soot Health Impacts: Where You Live, Denver County. Available at: <http://www.catf.us/diesel/dieselhealth/county.php?c=08031&site=0> (last accessed October 14, 2013).

<sup>x</sup> 40 C.F.R. 58.10(a)(1).

<sup>xi</sup> 40 C.F.R. 58.10(a)(1).

<sup>xii</sup> 40 C.F.R. 58, App. D(1).

<sup>xiii</sup> 40 C.F.R. 58, App. D(1.1).

<sup>xiv</sup> 40 C.F.R. 58, App. D(1.1.1).

<sup>xv</sup> 40 C.F.R. 58, App. D (1.1.1).

<sup>xvi</sup> We recognize and strongly support the transition underway at the Cherokee coal-fired power plant, and urge the full and swift phase out of coal combustion at that facility.

<sup>xvii</sup> EPA, Near Roadway Research website, available at: <http://www.epa.gov/nrml/appcd/nearroadway/index.html> (last accessed October 14, 2013).

<sup>xviii</sup> EPA, *Implementation of a National Near-Road NO<sub>2</sub> Monitoring Network*, 2011. [http://cfpub.epa.gov/si/si\\_public\\_file\\_download.cfm?p\\_download\\_id=505642](http://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=505642)

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<sup>xix</sup> 77 Fed. Reg. at 39009 (June 29, 2012).

<sup>xx</sup> *Id.*

<sup>xxi</sup> *Id.*

<sup>xxii</sup> 78 Fed. Reg. at 16,184 (March 14, 2013), *Revisions to Ambient Nitrogen Dioxide Monitoring Requirements*, Final Rule. <http://www.epa.gov/airquality/nitrogenoxides/pdfs/20130307fr.pdf>

<sup>xxiii</sup> EPA, *Fact Sheet: National Ambient Air Quality Standards for Carbon Monoxide*, 2011.

<http://www.epa.gov/airquality/carbonmonoxide/pdfs/COFactSheetAugust12v4.pdf>

<sup>xxiv</sup> EPA, *EPA's Revised Air Quality Standards for Particulate Pollution: Monitoring, Designations and Permitting Requirements*, 2012.

<http://www.epa.gov/airquality/particulatepollution/2012/decfsimp.pdf>

<sup>xxv</sup> EPA can use its discretion in approving a deviation from the PM<sub>2.5</sub> monitoring requirements as already exists in the network design criteria. Such deviations are to be approved by the Regional Administrator as described in section 4.7.1 of Appendix D to part 58.

<sup>xxvi</sup> 78 Fed. Reg. at 3238 (January 15, 2013).

<sup>xxvii</sup> 78 Fed. Reg. at 3238 (January 15, 2013).

<sup>xxviii</sup> Email from Will Allison, CDPHE, to Thad Tecza dated October 4, 2013.

<sup>xxix</sup> *Id.*

<sup>xxx</sup> Colorado Department of Transportation, *Traffic Data Explorer*, 2013. Available online at: <http://dtdapps.coloradodot.info/Otis/TrafficData> (last accessed October 30, 2013).

<sup>xxx1</sup> Email from Will Allison, CDPHE, to Thad Tecza dated October 4, 2013.

<sup>xxxii</sup> 78 Fed. Reg. at 3238.

<sup>xxxiii</sup> 78 Fed. Reg. at 3238.