



Next Generation Citizen Technology Spot the Smoke

Citizen Science Campaign Spot the Smoke

Track: A7 Paper 5

Electric Utility Environmental Conference

2016

San Diego

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Overview

- Brief History
- Integrating Methods and Technology
- Public Awareness Campaign
- “Spot the Smoke” – Using the App
- Concluding Trends





3/8/2013

Next Generation Air Embraces Mobile Apps Image based monitoring

DRAFT Roadmap for Next Generation Air Monitoring



http://www.regulations.gov/#documentDetail=D+EPA+HQ+OAR+2010+0895+0280

Regulations.gov - Rule Docu...

This Rule document was issued by the Environmental Protection Agency (EPA)

For related information, [Open Docket Folder](#)

Action Ferro-Alloy NESHAP BACT Determination Requires DCOT for Opacity measurement

Final rule.

Summary

This action finalizes the residual risk and technology review (RTR) conducted for the Ferroalloys Production source category regulated under national emission standards for hazardous air pollutants (NESHAP). These final amendments include revisions to particulate matter (PM) standards for electric arc furnaces, metal oxygen refining processes, and crushing and screening operations, and expand and revise the requirements to control process fugitive emissions from furnace operations, tapping, casting, and other processes. We are also finalizing opacity limits, as proposed in 2014. However, regarding opacity monitoring, in lieu of Method 9, we are requiring monitoring with the digital camera opacity technique (DCOT). Furthermore, we are finalizing emissions standards for four previously unregulated hazardous air pollutants (HAP): Formaldehyde, hydrogen chloride (HCl), mercury (Hg) and polycyclic aromatic hydrocarbons (PAH). Other requirements related to testing, monitoring, notification, recordkeeping, and reporting are included. This rule is health protective due to the revised emissions limits for the stacks and the requirement of enhanced fugitive emissions controls that will achieve significant reductions of process fugitive emissions, especially manganese.

Dates

This final action is effective on June 30, 2015. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of June 30, 2015.

Addresses

The Environmental Protection Agency (EPA) has established a docket for this action under Docket ID No. EPA-HQ-OAR-2010-0895. All documents in the docket are listed on the www.regulations.gov Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically through <http://www.regulations.gov>, or in hard copy at the EPA Docket Center, EPA WJC West Building, Room Number 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room hours of operation are 8:30 a.m. to 4:30 p.m. Eastern Standard Time (EST), Monday through Friday. The telephone number for the Public Reading Room is (202) 566-1744, and the telephone number for the Air Docket is (202) 566-1742.

For Further Information Contact

For questions about this final action, contact Phil Mulrine, Sector Policies and Programs Division (D243-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711; telephone number: (919) 541-5289; fax number: (919) 541-3207; and email address: mulrine.phil@epa.gov. For specific information regarding the risk modeling methodology, contact Darcie Smith, Health and Environmental Impacts Division (C539-02), Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711; telephone number: (919) 541-2076; fax number: (919) 541-0840; and email address: smith.darcie@epa.gov. For information about the applicability of the NESHAP to a particular entity, contact Cary Secret, Office of Enforcement and Compliance Assurance, U.S. Environmental Protection Agency, EPA WJC Building, 1200 Pennsylvania Ave. NW., Washington, DC 20460; telephone number: (202) 564-8661; and email address: secret.cary@epa.gov.

Supplementary Information

Comments Not Accepted

ID: EPA-HQ-OAR-2010-0895-0280

View original printed format: PDF

Tweet Share Email

Document Information

Date Posted: Jun 30, 2015

RIN: 2060-AQ11

CFR: 40 CFR Part 63

Federal Register Number: 2015-15038

Show More Details

Docket Information

This document is contained in EPA-HQ-OAR-2010-0895

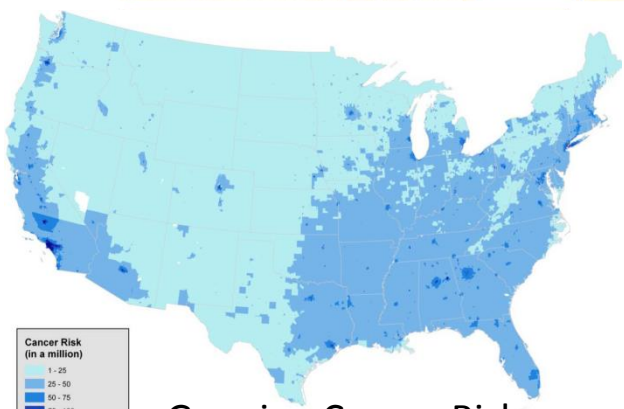
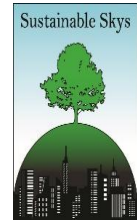
Related Dockets: None

Related RINs: None

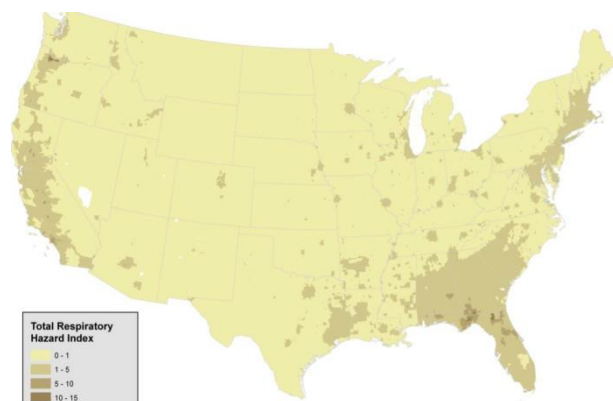
Related Documents:

- National Emission Standards for Hazardous Air Pollutants...
- National Emission Standards for Hazardous Air Pollutants...
- National Emission Standards for Hazardous Air Pollutants...

Document text and images courtesy of the Federal Register



Growing Cancer Risk



Growing Respiratory Risk

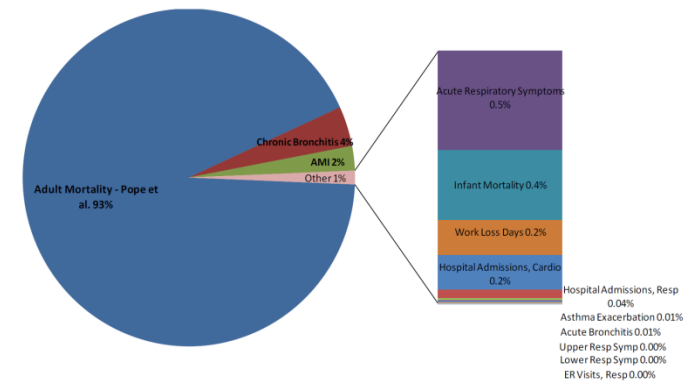


Figure 6-1. Breakdown of Monetized PM_{2.5} Health Benefits Estimates using Mortality Function from Pope et al. (2002)^a

^a This pie chart breakdown is illustrative, using the results based on Pope et al. (2002) as an example. Using the Laden et al. (2006) function for premature mortality, the percentage of total monetized benefits due to adult mortality would be 97%. This chart shows the breakdown using a 3% discount rate, and the results would be similar if a 7% discount rate was used.

Monetizing Mortality

The Growing Risk of PM 2.5 Alone is Monetized into the Billions of Dollars Annually Next Generation Monitoring is a Reality, Everybody Cares and Everybody has a Cell Phone

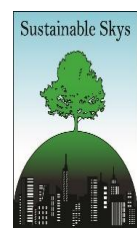




Brief History

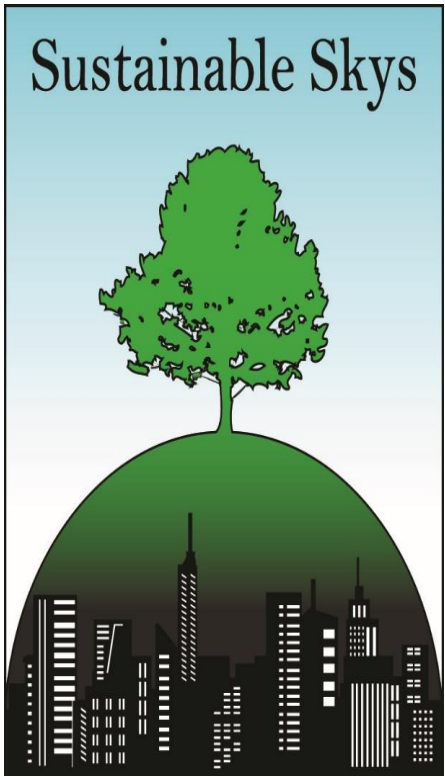
- Air contamination and associated health effects continue to escalate
- Inability for public involvement is due largely to specialization of monitoring methods and detail of education
- Accessible technology improves public participation and increases awareness for concerned citizens
- Citizen science enabled with the use of new methods & technology
- Sustainable Skys' develops "Spot the Smoke" as a citizen science project





Integrating Methods & Technology

“Spot the Smoke”



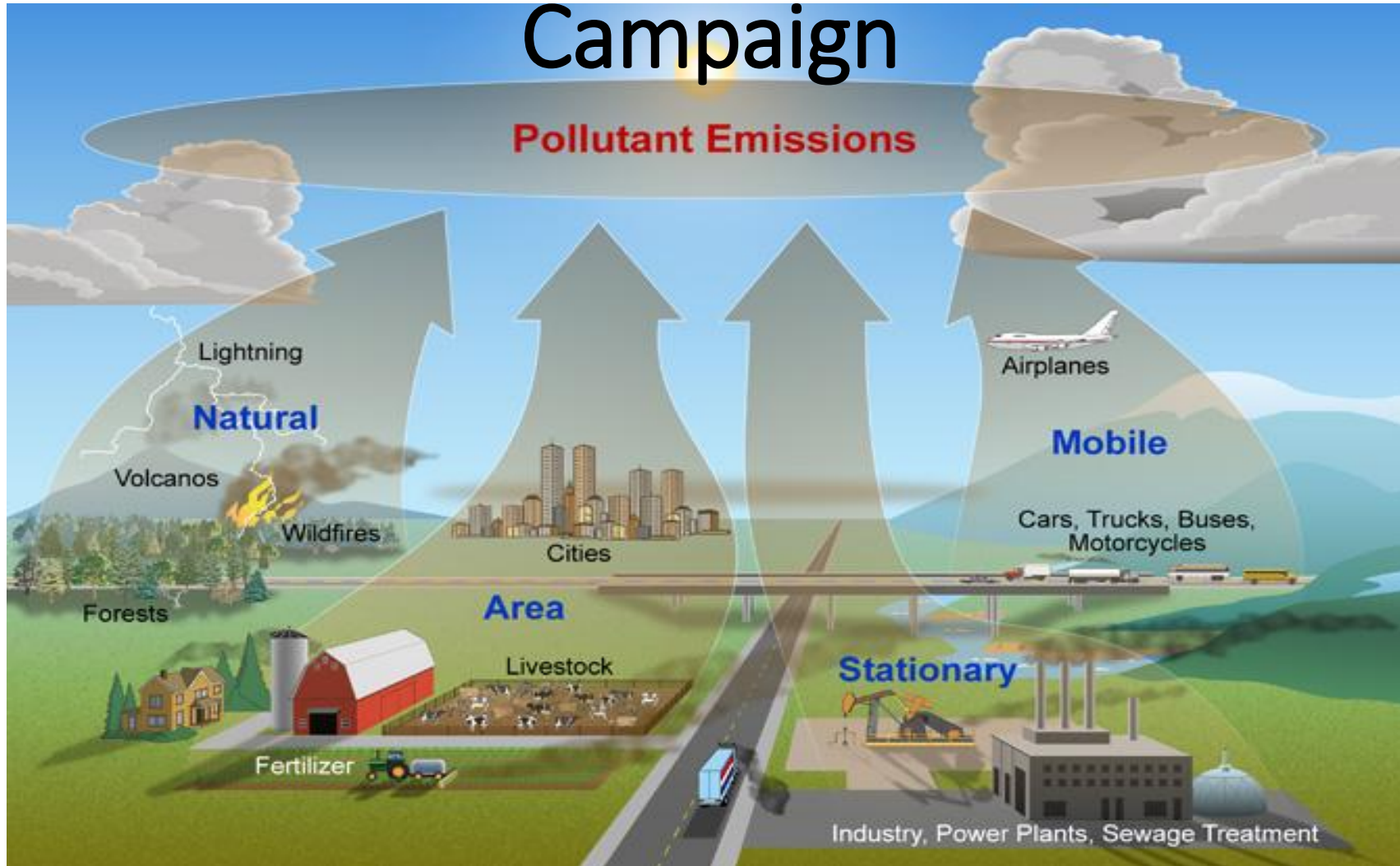
- Technology
 - Digital Opacity Compliance System Second Generation (DOCS II)
- Methods
 - Certified to US EPA Alternative Method 082
 - “in lieu of” Method 9

- Public awareness
 - Outreach and education
 - Social media platforms

- Citizen Science
 - Free public application
 - Cloud hosted & readily available on all platforms



Spot the Smoke Public Awareness Campaign



Proving knowledge through simplifying air pollution

Spot the Smoke, Rev 1

Using the App

Application Methodology



Step 1: Take picture of emission source



Step 2: login



Step 3: Name and describe what it is you see



Step 4: Allow GPS access and tap where the source is on the screen



Step 5: Attach image from gallery



Step 6: Click generate report and an analyst will receive an opacity request notification

REPORT

OBSERVATION NAME: DUST DEVIL DATE: 8/11/2014
 NAME: ALLISON DOLAN
 COMMENTS: DUST SPIRALING UP TO THE SKY



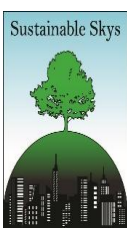

HEIGHT OF EMISSION POINT: N/A
 HEIGHT OF EMISS. PT. REL. TO OBSERVER: N/A
 DISTANCE TO EMISS. POINT: 123.09
 DIRECTION TO EMISS. POINT (DEGREES): 79.45
 VERTICAL ANGLE TO OBS. POINT: N/A
 DIRECTION TO OBS. POINT: 79.29
 DISTANCE TO OBSERVATION POINT FROM EMISSION POINT: 2.64
 DIRECTION TO OBSERVATION POINT FROM EMISSION POINT: 43.29

LONGITUDE: 111.03.05.230 W
 LATITUDE: 31.28.20.292 N

Step 7: Wait for an email back from an analyst with a link that connects you to a full copy of your report



Spot the Smoke, Rev 2 Using the App



Step 1

Home DOCS II SaaS Hello shawn dolan | Logout | Help



Plan Step 2

Date: 2/4/2016
 Name: holdSurvey_31
 What do you see? Demo Screen Shot describes what is being witnessed, bus, train, utility, refinery, and so on

Done

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Open an Existing Observation

Actions	Name	Creation Date	Observer	Status	Analyzed Date
	holdSurvey_8	02/04/2016	shawn dolan	Complete	02/04/2016
	holdSurvey_45	02/04/2016	shawn dolan	Complete	02/04/2016

Do Step 3

GPS Acquired
 Weather Acquired

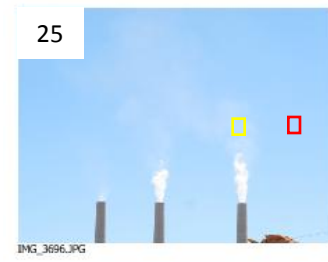
Done

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You must push one of the buttons below to finish the transaction.

REPORT
 OBSERVATION NAME: HOLDSURVEY_32
 DATE: 2/4/2016
 NAME: SHAWN DOLAN
 COMMENTS: DEMO

Step 6



Check

Get Images

Step 4

Done

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-Touch the Get Images Button to browse your local Gallery.
 -Select a picture or video clip (3 seconds) of the pollution.
 -After you select a picture, you will be returned to the Check Screen, and your upload progress will be displayed. When the Upload is complete you will receive a Success message.
 -Touch Done to move to the Act Screen



HEIGHT OF EMISSION POINT: N/A
 HEIGHT OF EMISS. PT. REL. TO OBSERVER: N/A
 DISTANCE TO EMISS. POINT: 32.06
 DIRECTION TO EMISS. POINT (DEGREES): 68.93
 VERTICAL ANGLE TO OBS. POINT: N/A
 DIRECTION TO OBS. POINT: 68.93
 DISTANCE TO OBSERVATION POINT FROM EMISSION POINT: N/A
 DIRECTION TO OBSERVATION POINT FROM EMISSION POINT: N/A

LONGITUDE: 117.09.55.404 W
 LATITUDE: 32.42.29.916 N

How Fast Do You Need It?
 Free
 24 Hours (\$4.99)
 4 Hours (\$14.99)

WEATHER
 WIND SPEED: 5 WIND DIRECTION: 140 AMBIENT TEMPERATURE: 55
 WET BULB TEMPERATURE: 44 RH PERCENT: 67

Act

Generate Report

Done

Step 5

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-Touch Generate Report to see a copy of the report.
 -Touch Done to Return to the Home Screen



Spot the Smoke Report

- Users GPS location (Defines Jurisdiction)
- Time the photo was taken
- Height of emission point
- Direction of emission/observation point
- Weather streamed from NOAA
- Sun position at the time of the photo
- Opacity percentage

REPORT

OBSERVATION NAME: DUST DEVIL

DATE: 8/11/2014

NAME: ALLISON DOLAN

COMMENTS: DUST SPIRALING UP TO THE SKY



HEIGHT OF EMISSION POINT: N/A

HEIGHT OF EMISS. PT. REL. TO OBSERVER: N/A

DISTANCE TO EMISS. POINT: 123.09

DIRECTION TO EMISS. POINT (DEGREES): 79.45

VERTICAL ANGLE TO OBS. POINT: N/A

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LONGITUDE: 111.03.05.230 W

LATITUDE: 31.28.20.292 N





Spot the Smoke

Project Data Discovery



- Spot the Smoke Released in March 2015
 - Buggy and did not operate well on iphone platform until rev 2 in June 2015
 - Still has browser compatibility issues works plug and play 85% of the time.
 - 23,250 Subscribed accounts
- Roughly 10,000 Active accounts any 6 month period
 - Produce about 100 images a day
- Stationary Sources (~20 day)
 - Requiring Permits, require other compliance monitoring
 - Category people pay to expedite
- Mobile Sources
 - Smaller mobile sources, cars, trucks (~5 day)
 - Requiring frequent Licensing
 - Larger mobile sources, planes, trains, ships (~15 day)
 - Reduced licensing frequency
- Area Sources
 - Larger Sources farms and agriculture (~10 day)
 - Fugitive emissions, largest category of undocumented air pollution (~50 day)
 - Includes Wood Smoke also category people pay to expedite
- Natural sources (spikes during event)
 - Great Forest Fire Pictures
 - Not predictable





Spot the Smoke Current Trends



- Technical Lessons Learned, use only Google tools
 - Let Google test on every platform
 - Keep it simple
- Stationary Sources are increasingly being citizen policed
- Mobile Sources
 - Smaller mobile sources, cars, trucks, low priority
 - Larger mobile sources, planes, trains, ships are, increasingly being citizen policed
- Area Sources are increasingly being citizen policed
 - Fugitive emissions, largest category of undocumented air pollution, being citizen policed
- Natural sources, Everybody loves to take pictures





Spot the Smoke Rev. 3



Sustainable Skys

Home Mission **Spot-the-Smoke**

Login To Spot-the-Smoke

Email:

Password:

Login Cancel

Step 1

Problems with Spot-the-Smoke? Support@sustainableSkys.org

sustainablekys.org

Choose File No file chosen

Step 2

Submit [Your Observations](#) [Report](#)

sustainablekys.org

Choose File 14546429293...975133.jpg

Submit [Your Observations](#) [Report](#)

sustainablekys.org

Choose File No file chosen

Choose an action

Step 3

sustainablekys.org

Step 4

Sending...

sustainablekys.org

Step 5

25

Observer: Shawn Dolan

Date: 1/24/2016

Analyst: Pat Grieco

Opacity: 25

Latitude: 41.200994

Longitude: -112.103371

Wind Direction: S
Wind Speed: 12
Ambient Temp: 53
Rel Humidity: 55
Wet Bulb: 37

[Print](#)



Camera

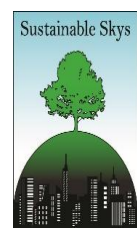


Documents



Revision 3 release February 20, 2016, Get your account Now
www.SustainableSkys.org





Conservation, Compliance, Sustainability, Training
Regulatory Policy and Enforcement, Local and International

FAMILIES FOR CLEAN AIR



ArcelorMittal



California Environmental Protection Agency



Industrial Technology Institute
Sri Lanka



EPA ALT 082, The "Best" solution





Questions

Shawn Dolan

Shawn.Dolan@virtualc.com

888 872 3836

801 309 3626

Download your app today:

<http://www.sustainablekys.org>

(click on “Spot the Smoke” icon)

