



CAMP

Community Air Monitoring Program

STEM Ambassador Leadership

“Think Globally. Act Locally.”

“Knowledge is Power.”

“Youth is the Future.”

Potential for Impact

Education # Research # Advocacy
Emergent Opportunities for Co-Creation

AQM Landscape

Government

Non-Government

EPA

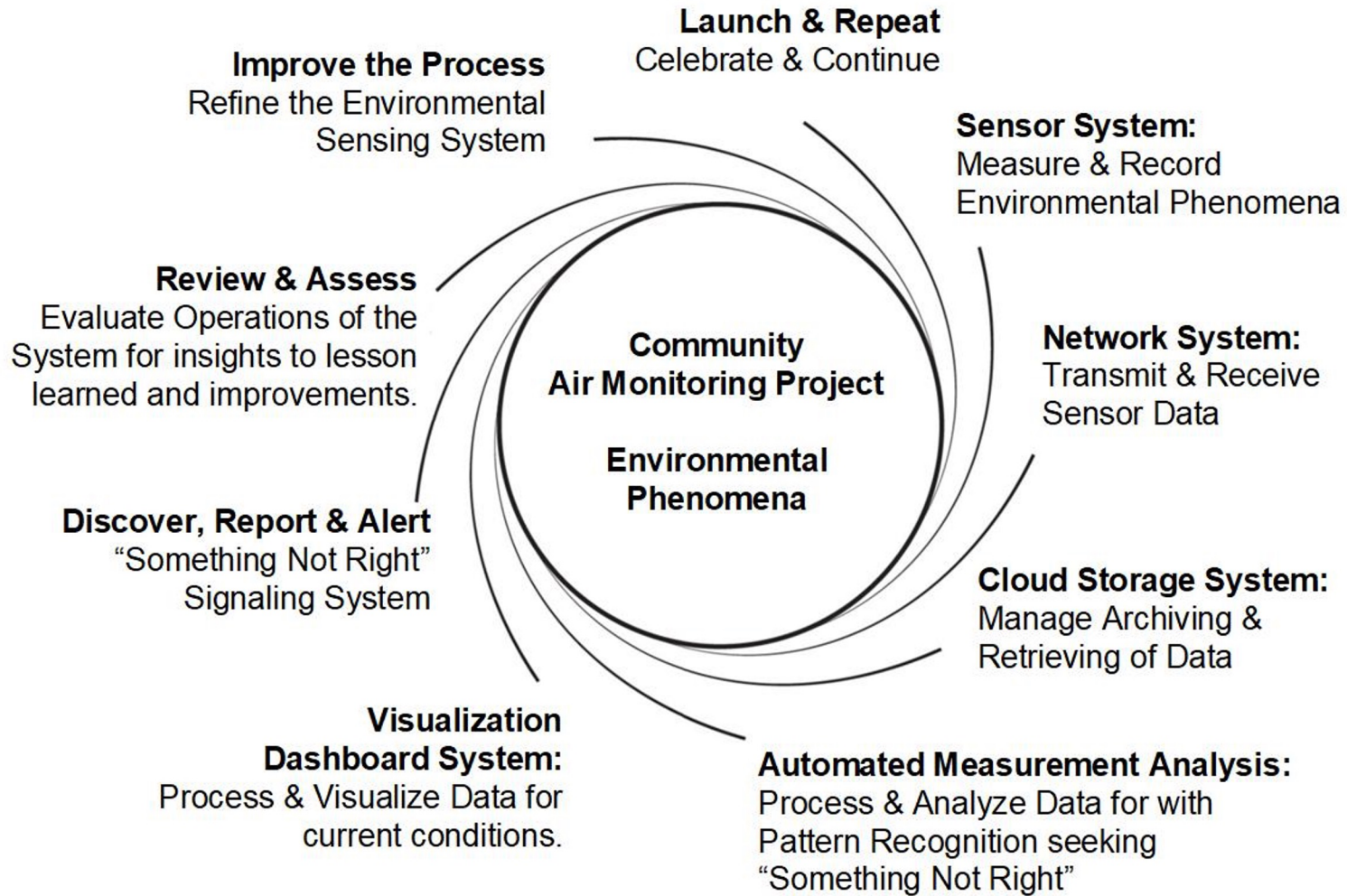
Academia

DEP

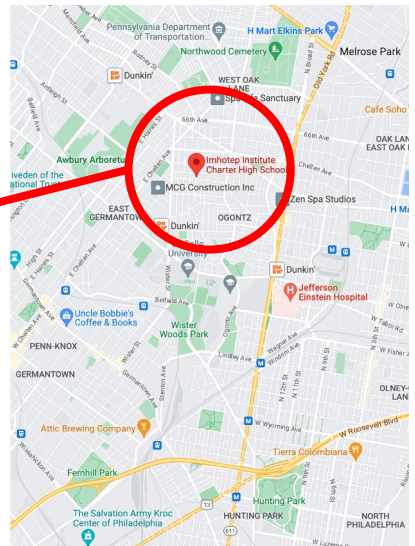
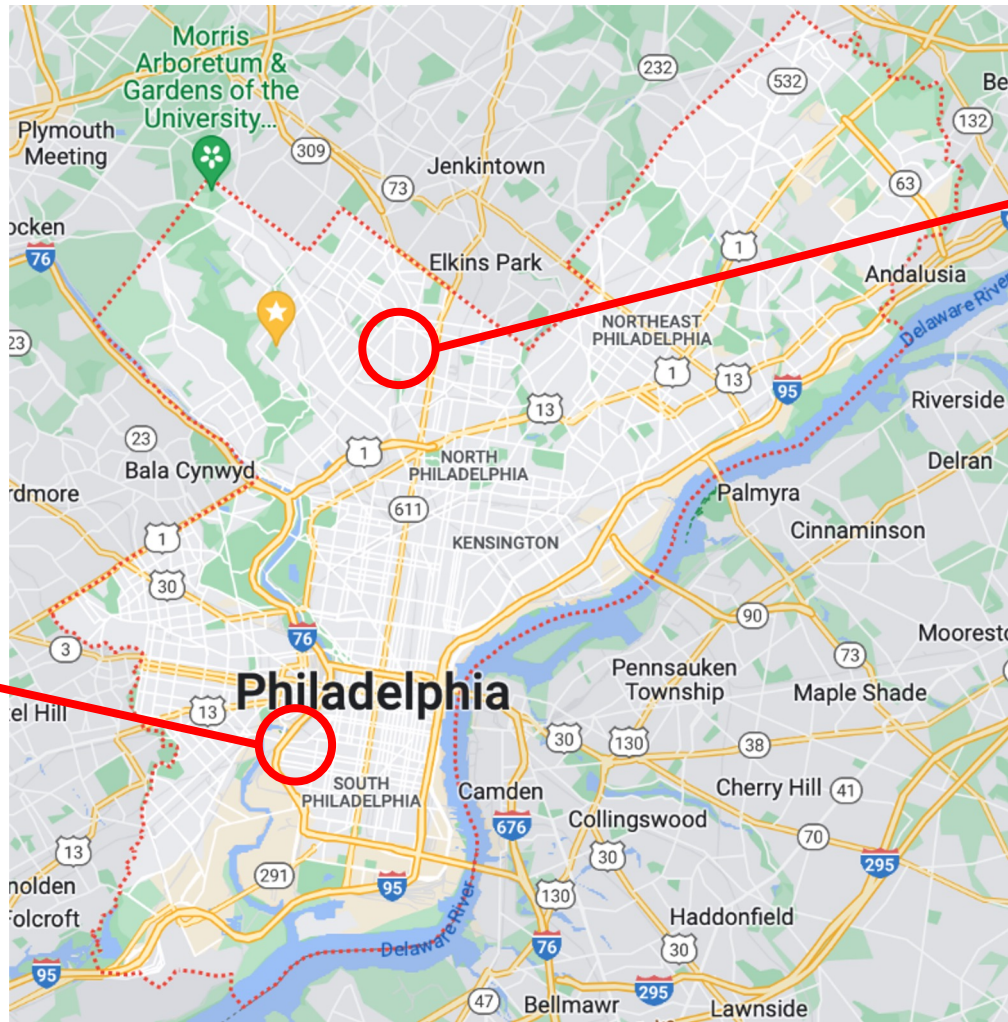
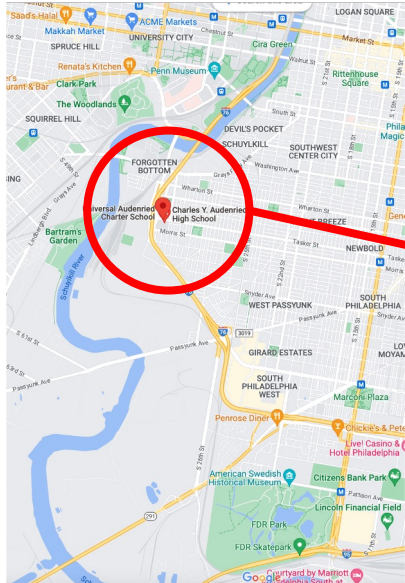
Industry

AMS

Citizen Science



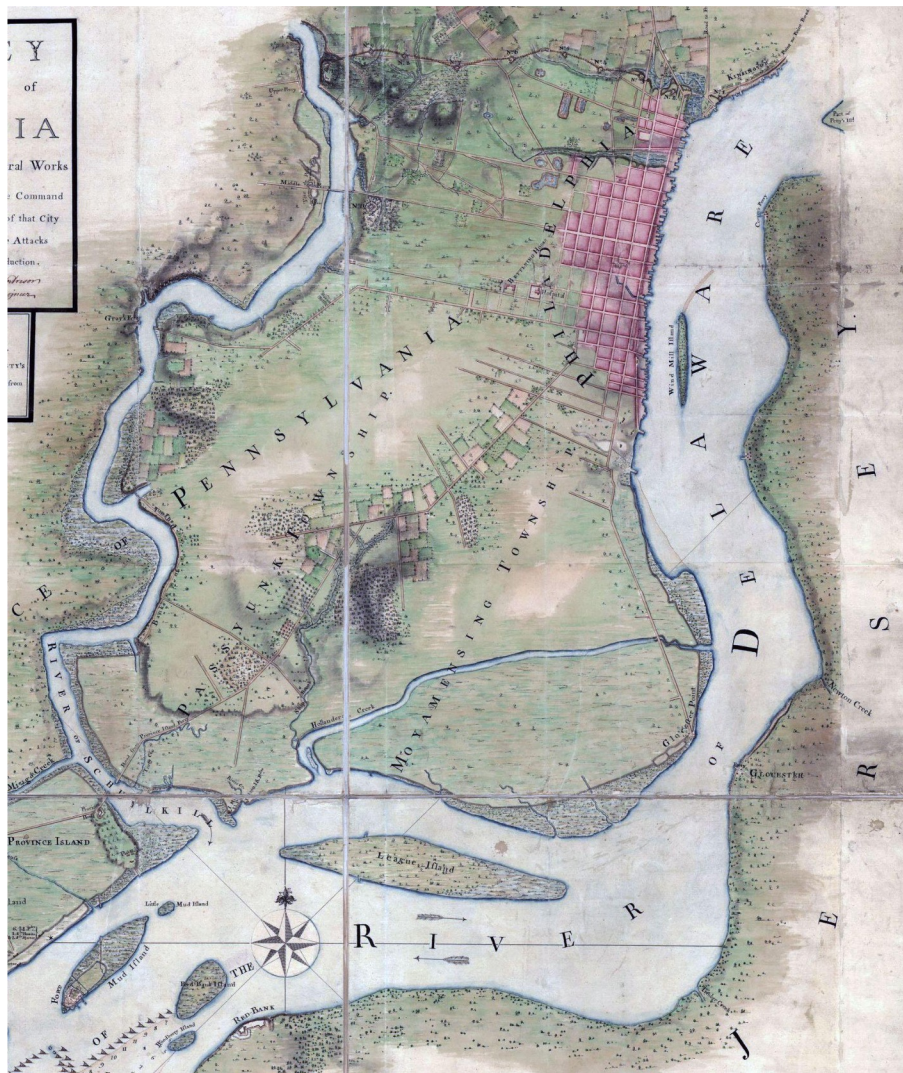
Audenreid



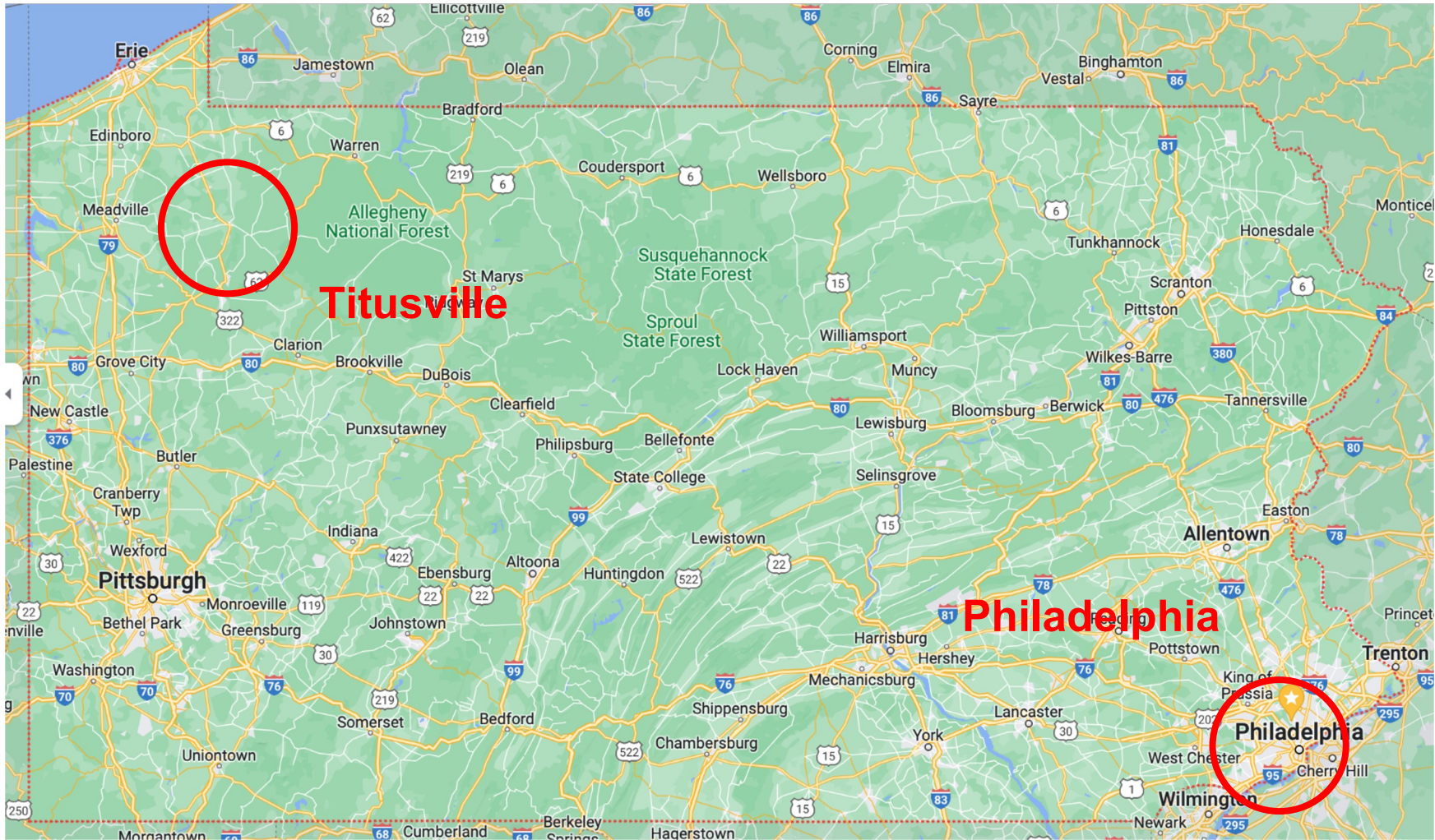
Imhotep



Delaware River Watershed



General Howe's Map 1777



Titusville

Philadelphia

Philadelphia



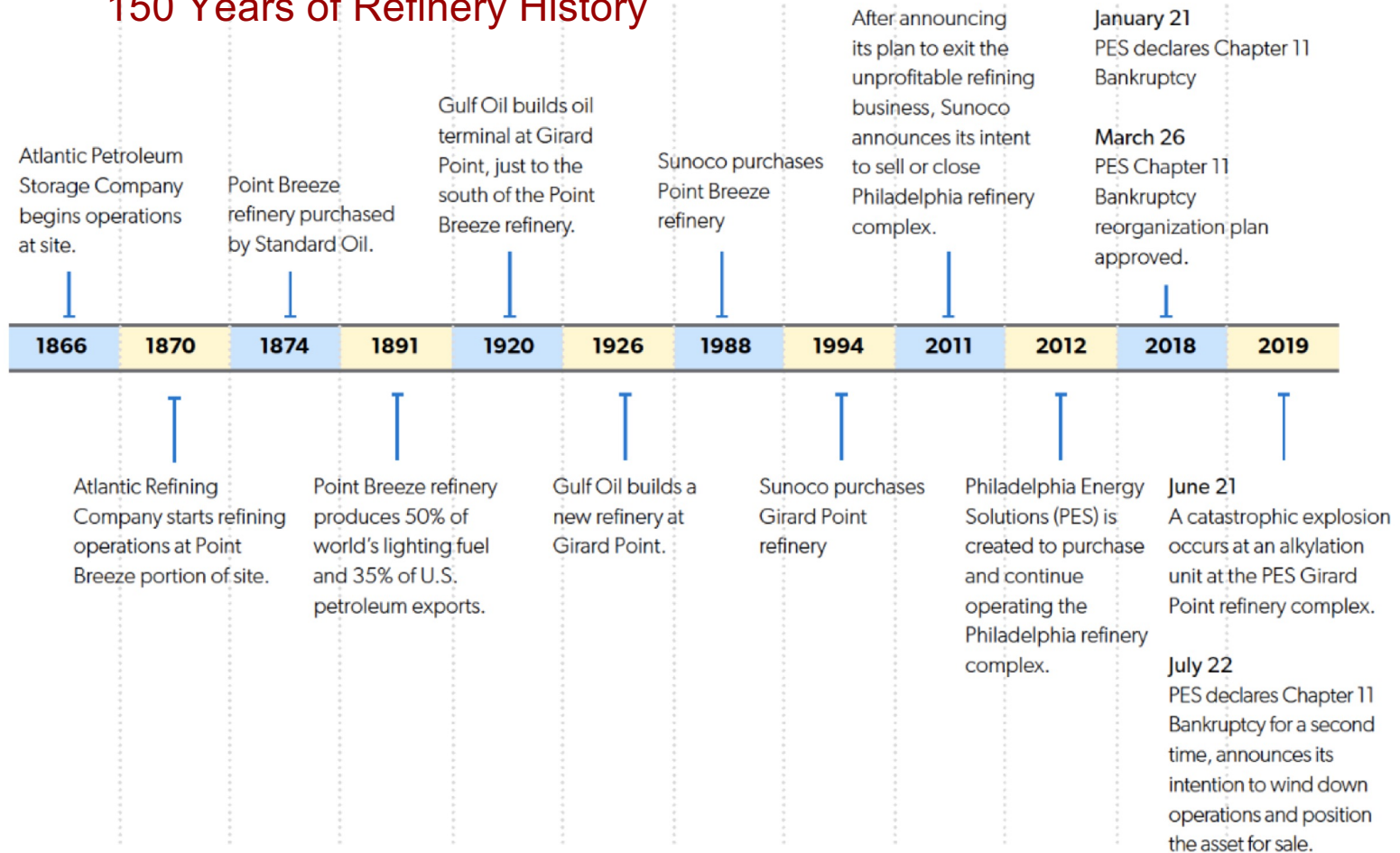
During the 19th-century boom, the domestic output of crude went from 2,000 barrels in 1859, the year of Mr. Drake's well, to four million barrels in 1869 and 10 million in 1873.

“Around that 1870 Penn Brad Oil had drilled 40,000 wells producing 82 percent of world's oil.

Much of that Oil was shipped to the Philadelphia Oil Refineries.

Edwin Drake, left, in 1859 with the first big mechanical oil well drilled in Titusville, Pa

150 Years of Refinery History



Animation of PES Explosion: June 21, 2019

https://www.youtube.com/watch?v=gc8qXTh6tTY&t=10s&ab_channel=USCSB

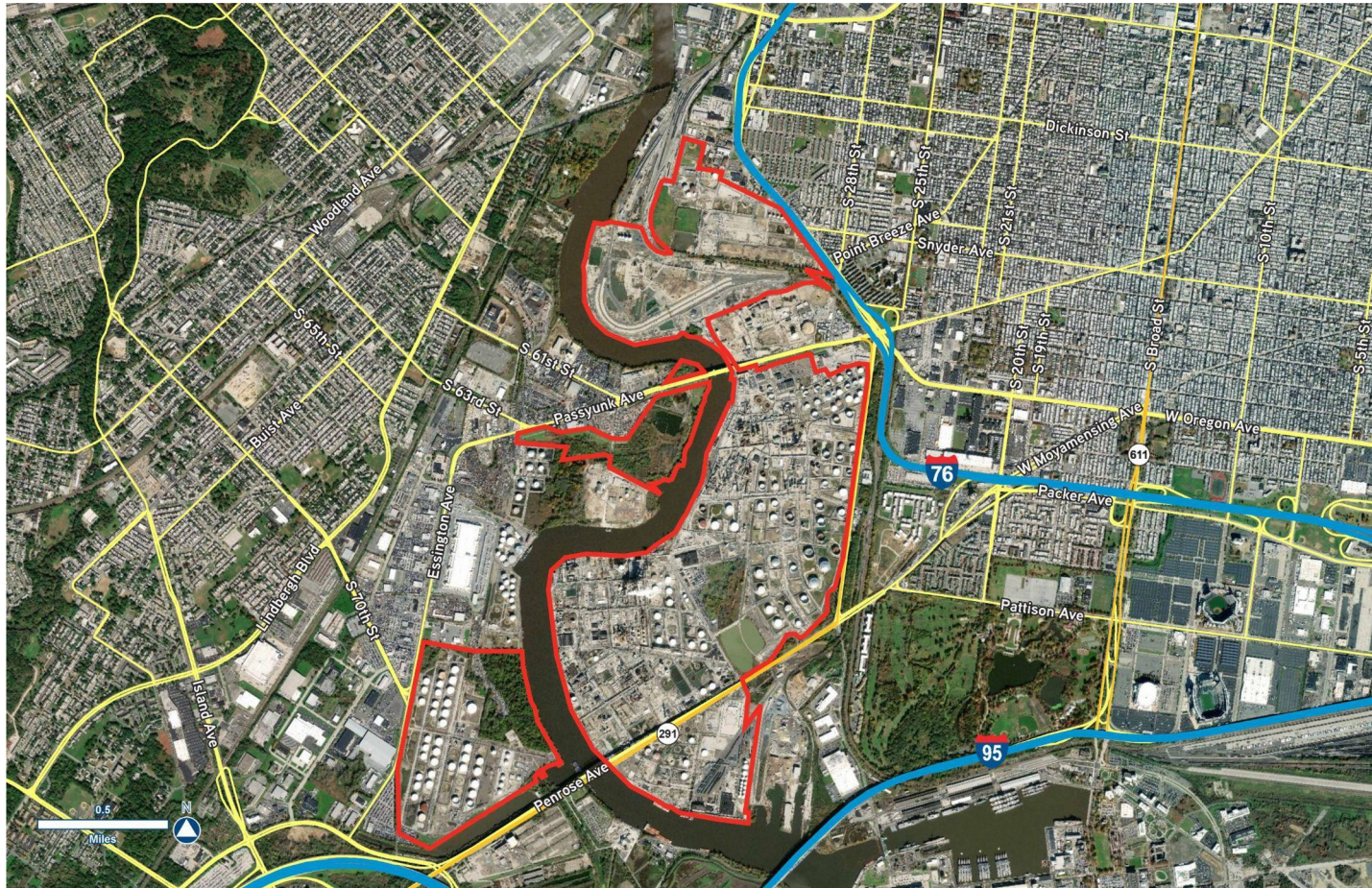


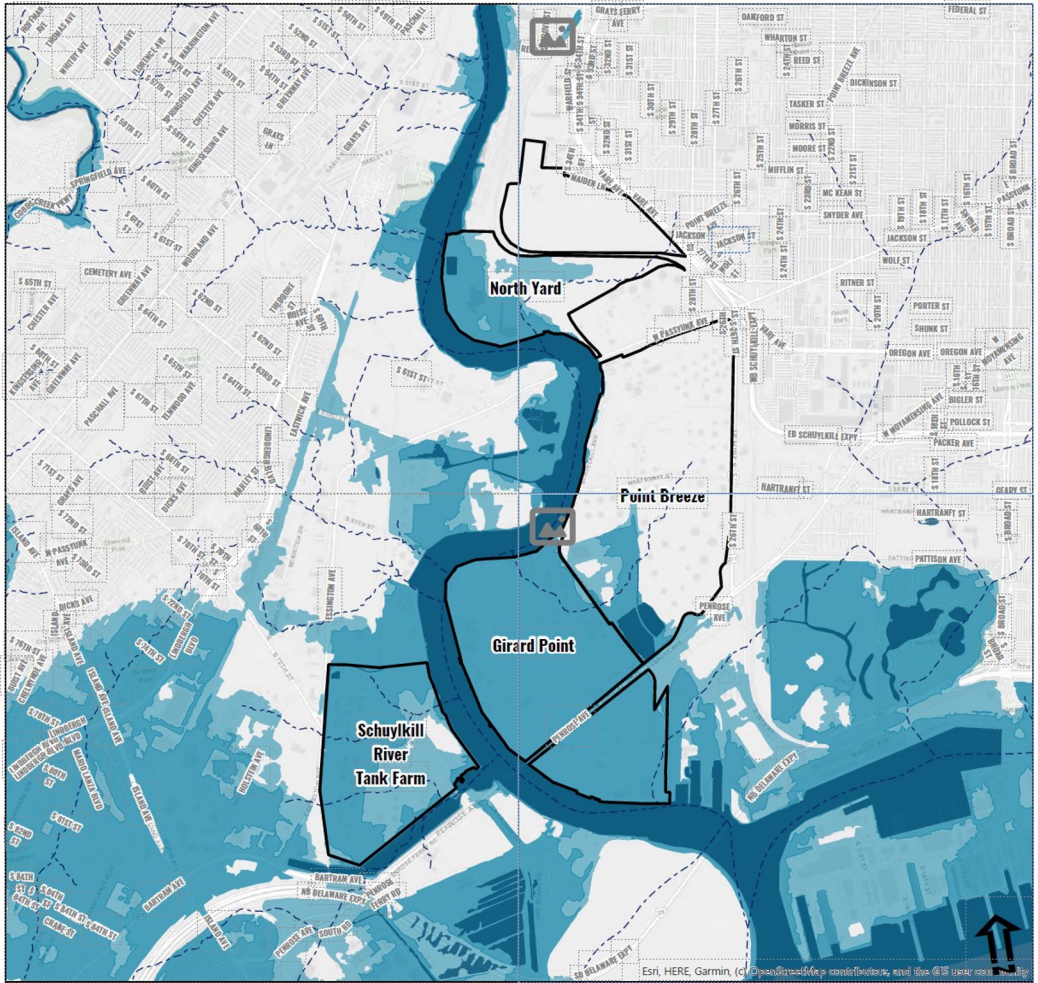
©CSB







South Philadelphia: June 21, 2019

HRP: 1,300 Acres





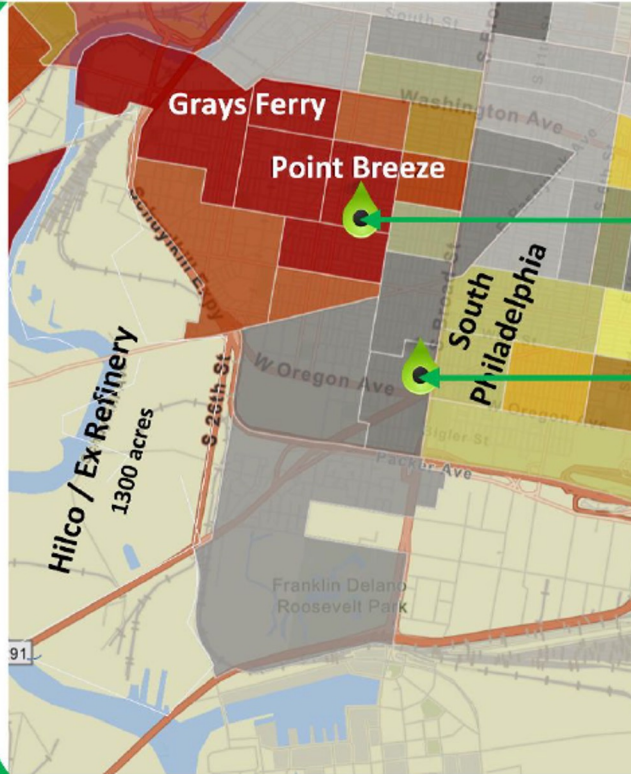
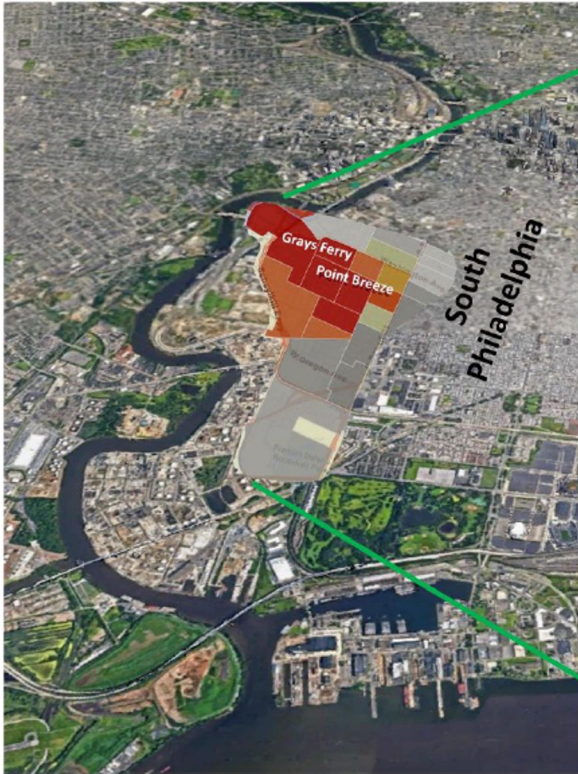
HYDROLOGY: FEMA FLOOD MAPPING

-  PES Parcels
 -  Hydrologic Features
 -  Historic Streams
- FEMA Flood Plains
-  100 Yr Flood Plain
 -  500 Yr Flood Plain

Data Source: Federal Emergency Management Agency



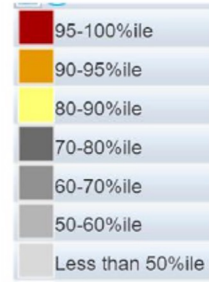
Community Air Monitoring Projects



Philly Thrive
Community Engagement
HQ location



AQM AMS
City of Philadelphia
Monitoring location



LEGEND:
Sum of the percentile
Of the highest asthma
rates and lowest
life expectancy rates
compared to
national averages.



Find address or place



Layer List

RETA 33
10th Street
Center

48th &
Woodland
Playground

Gray's Ferry
Crescent

Meiklejohn
Stadium

Gray's Ferry
Shopping Center

Stinger
Squares

GRAYS
FERRY

POINT
BREEZE

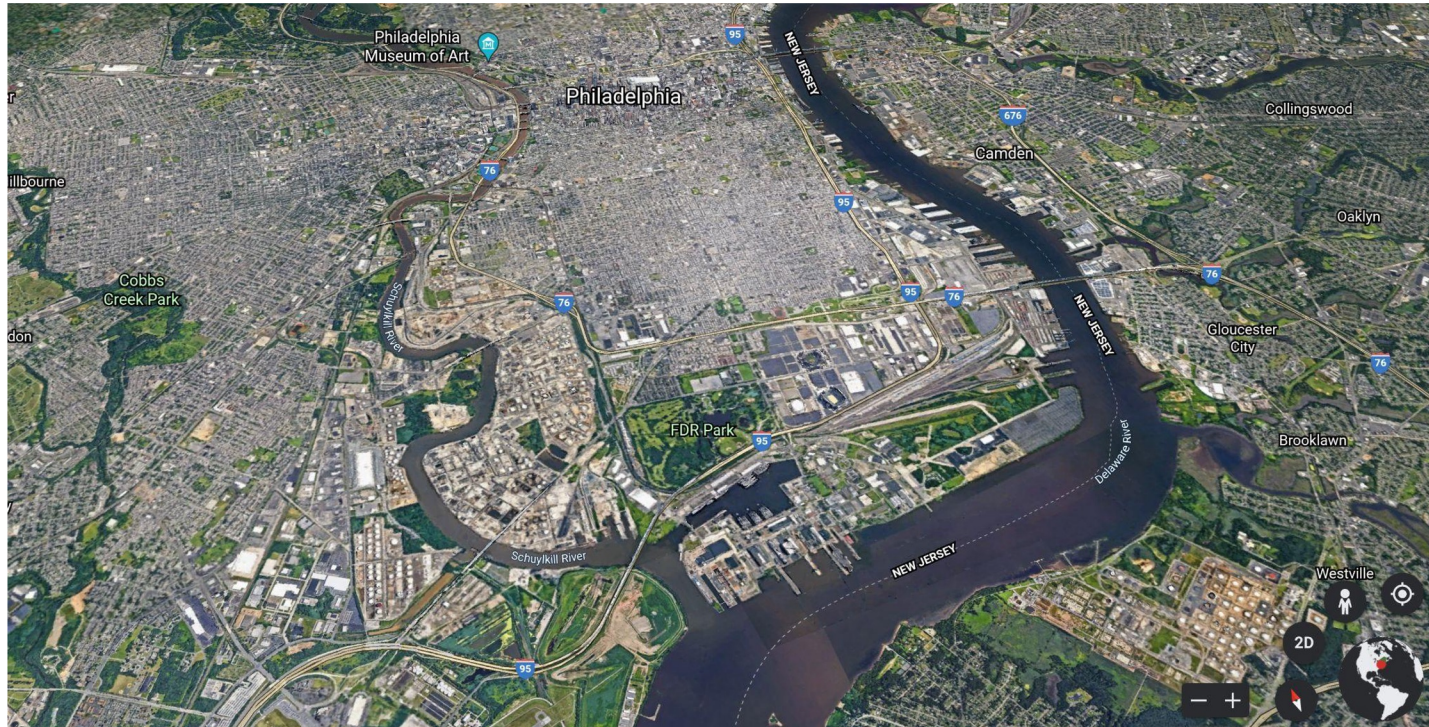
Preparatory
Charter
School

Wilson
Park

Philadelphia
Gas Works

0.2mi

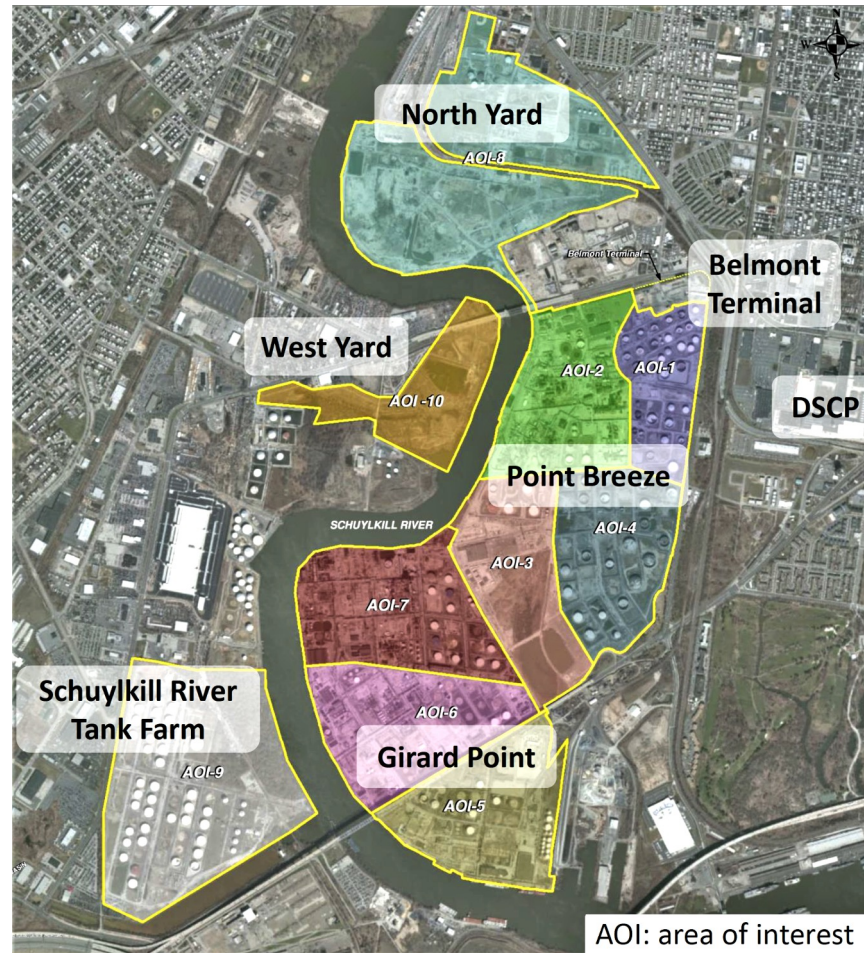
Lower Schuylkill Watershed and Landscape



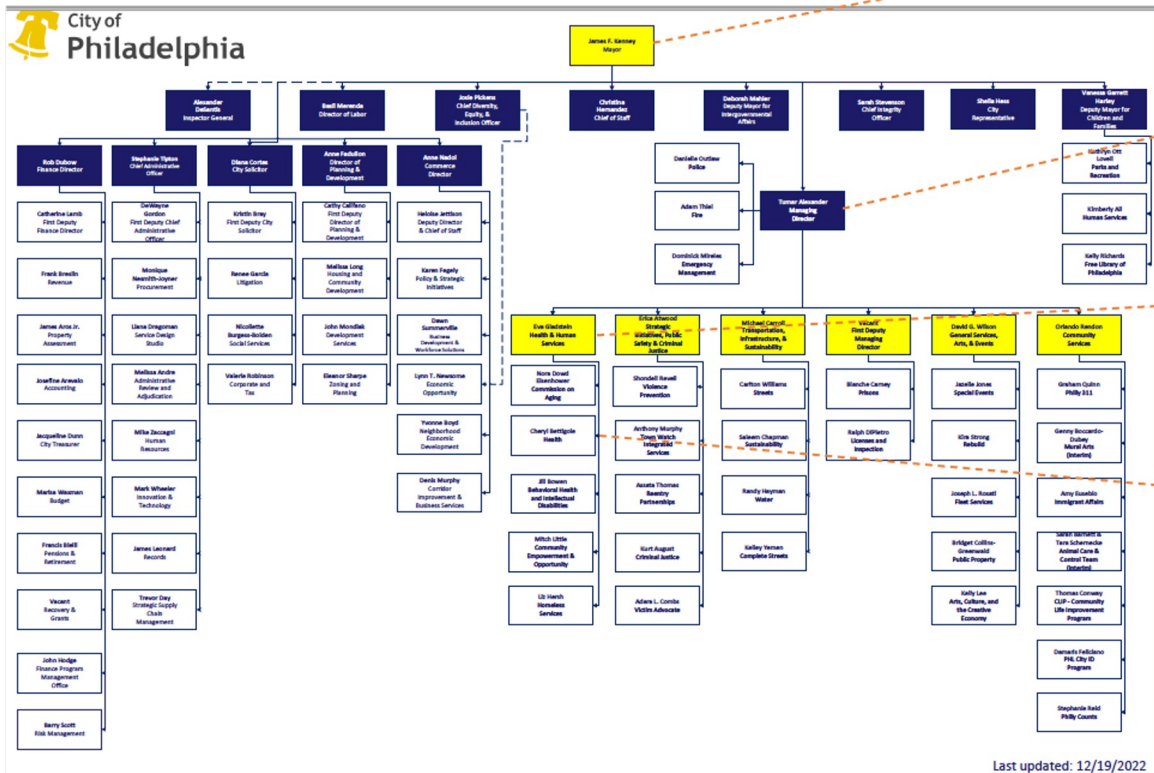
Click Below for GOOGLE EARTH VIEW

<https://earth.google.com/web/search/bartrums+garden+philadelphia/@39.91015462,-75.18769499,6.92587148a,12354.11362718d,35y,23.86715371h,43.68762703t,-0r/data=CigiJgokCYjFt9tk9TNAEYjFt9tk9TPAGS43zihoQTpAIVM1i9SMxFLA>

HRP: 1,300 Acres



AQM in Philadelphia



James F. Kenney
Mayor

Tumar Alexander
Managing Director

Eva Gladstein
Health & Human Services

Cheryl Bettigole
Health Commissioner

Kassahun Sellassie
Air Management Services

Criteria Air Pollutants

PM	Particulate Matter (PM10, PM2.5, PM1)
O ₃	Photochemical Oxidants (Ozone Precursors)
CO	Carbon Monoxide
SO _x	Sulfur Oxides (SO, SO ₂)
No _x	Nitrogen Oxides (NO, NO ₂)
Pb	Lead

NAAQS - National Ambient Air Quality Standards (Clean Air Act)

Meteorological Data

Temperature

Humidity (Relative)

Barometric Pressure

UV Radiation

Solar Radiation

Precipitation

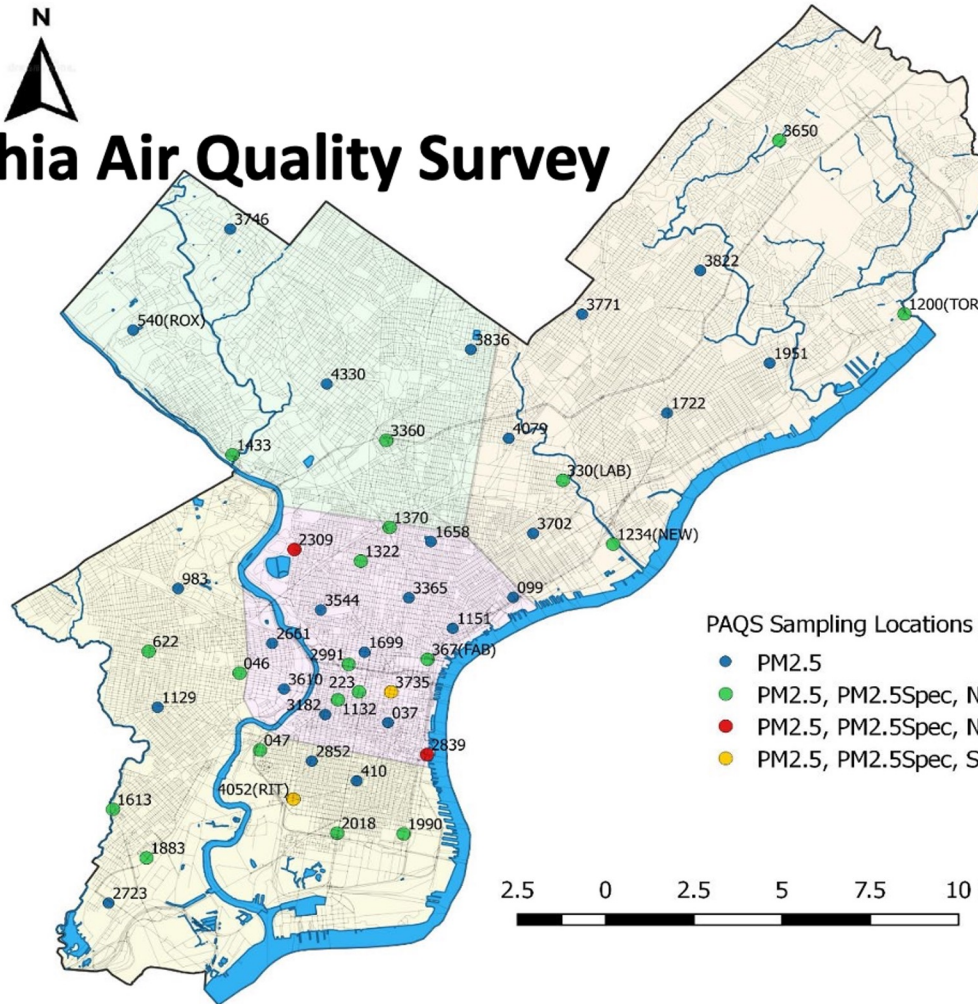
Wind Speed

Wind Direction



Philadelphia Air Quality Survey

(PAQS)



Air Toxics

BTEX

Benzene

Toluene

Ethylbenzene

Xylene (m-, o-, & p-)

Other

Acetaldehyde

Formaldehyde

Top 7 Philadelphia Air Toxics

1. Formaldehyde

2. Benzene

3. Carbon Tetrachloride

4. Naphtalene

5. Acetaldehyde

6. 1,3-Butadiene

7. Ethylene Oxide

188 Hazardous Air Pollutants (HAPS)

30 Urban Air Toxics

Acetaldehyde	Dioxin	Mercury compounds
Acrolein	Propylene dichloride	Methylene chloride (dichloromethane)
Acrylonitrile	1,3-dichloropropene	Nickel compounds
Arsenic compounds	Ethylene dichloride (1,2-dichloroethane)	Polychlorinated biphenyls (PCBs)
Benzene	Ethylene oxide	Polycyclic organic matter (POM)
Beryllium compounds	Formaldehyde	Quinoline
1,3-butadiene	Hexachlorobenzene	1,1,2,2-tetrachloroethane
Cadmium compounds	Hydrazine	Tetrachloroethylene (perchloroethylene)
Chloroform	Lead compounds	Trichloroethylene
Chromium compounds	Manganese compounds	Vinyl chloride

Target Compound List

Priority Compounds			Optional Compounds				
1	1,2,3-trimethylbenzene ^a	19	n-hexane ^b	1	1,3,5-trimethylbenzene	19	m-diethylbenzene
2	1,2,4-trimethylbenzene ^a	20	n-pentane	2	1-pentene	20	methylcyclohexane
3	1-butene	21	o-ethyltoluene ^a	3	2,2-dimethylbutane	21	methylcyclopentane
4	2,2,4-trimethylpentane ^b	22	o-xylene ^{a,b}	4	2,3,4-trimethylpentane	22	n-decane
5	acetaldehyde ^{b,c}	23	p-ethyltoluene ^a	5	2,3-dimethylbutane	23	n-heptane
6	acetone ^{c,d}	24	Propane	6	2,3-dimethylpentane	24	n-nonane
7	benzene ^{a,b}	25	propylene	7	2,4-dimethylpentane	25	n-octane
8	c-2-butene	26	styrene ^{a,b}	8	2-methylheptane	26	n-propylbenzene ^a
9	ethane ^d	27	toluene ^{a,b}	9	2-methylhexane	27	n-undecane
10	ethylbenzene ^{a,b}	28	t-2-butene	10	2-methylpentane	28	p-diethylbenzene
11	Ethylene			11	3-methylheptane	29	t-2-pentene
12	formaldehyde ^{b,c}			12	3-methylhexane	30	α/β -pinene
13	Isobutane			13	3-methylpentane	31	1,3 butadiene ^b
14	Isopentane			14	Acetylene	32	benzaldehyde ^c
15	Isoprene			15	c-2-pentene	33	carbon tetrachloride ^b
16	m&p-xylenes ^{a,b}			16	cyclohexane	34	Ethanol
17	m-ethyltoluene ^a			17	cyclopentane	35	Tetrachloroethylene ^b
18	n-butane			18	isopropylbenzene ^b		

Source: Revisions to the Photochemical Assessment Monitoring Stations Compound Target List.
U.S. EPA, November 20, 2013

^a Important SOAP (Secondary Organic Aerosols Precursor) Compounds

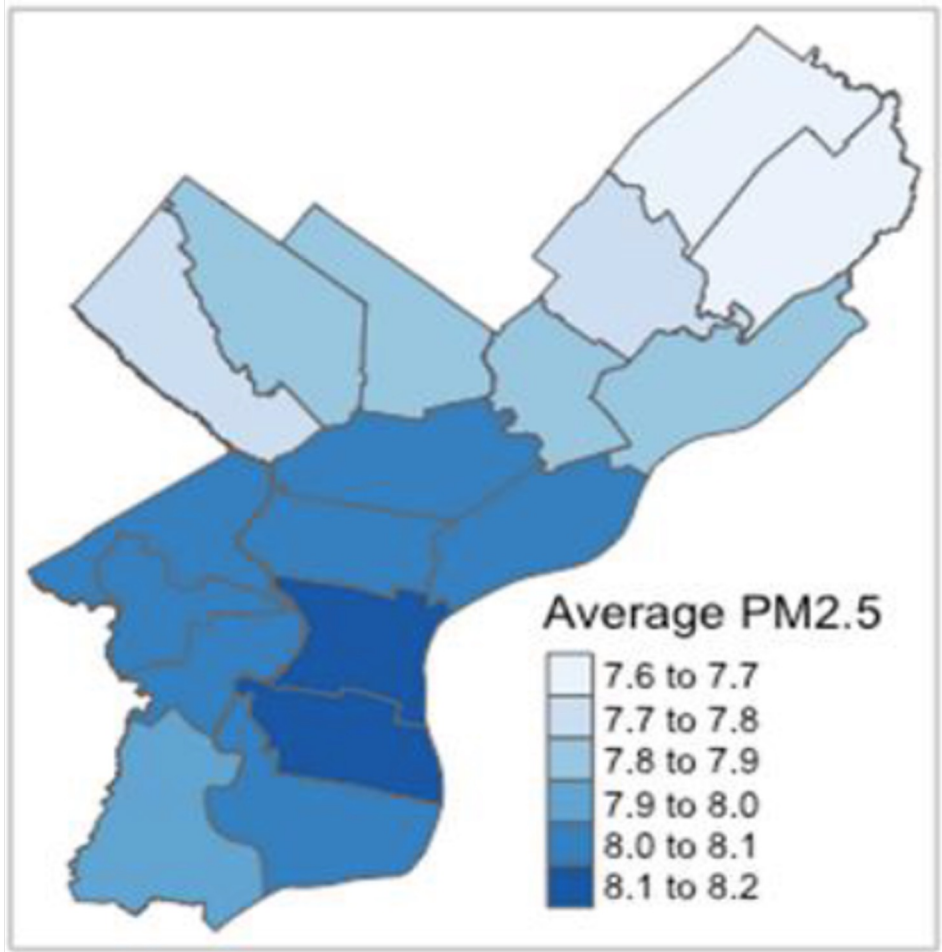
^b HAP (Hazardous Air Pollutant) Compounds

^c Carbonyl compounds

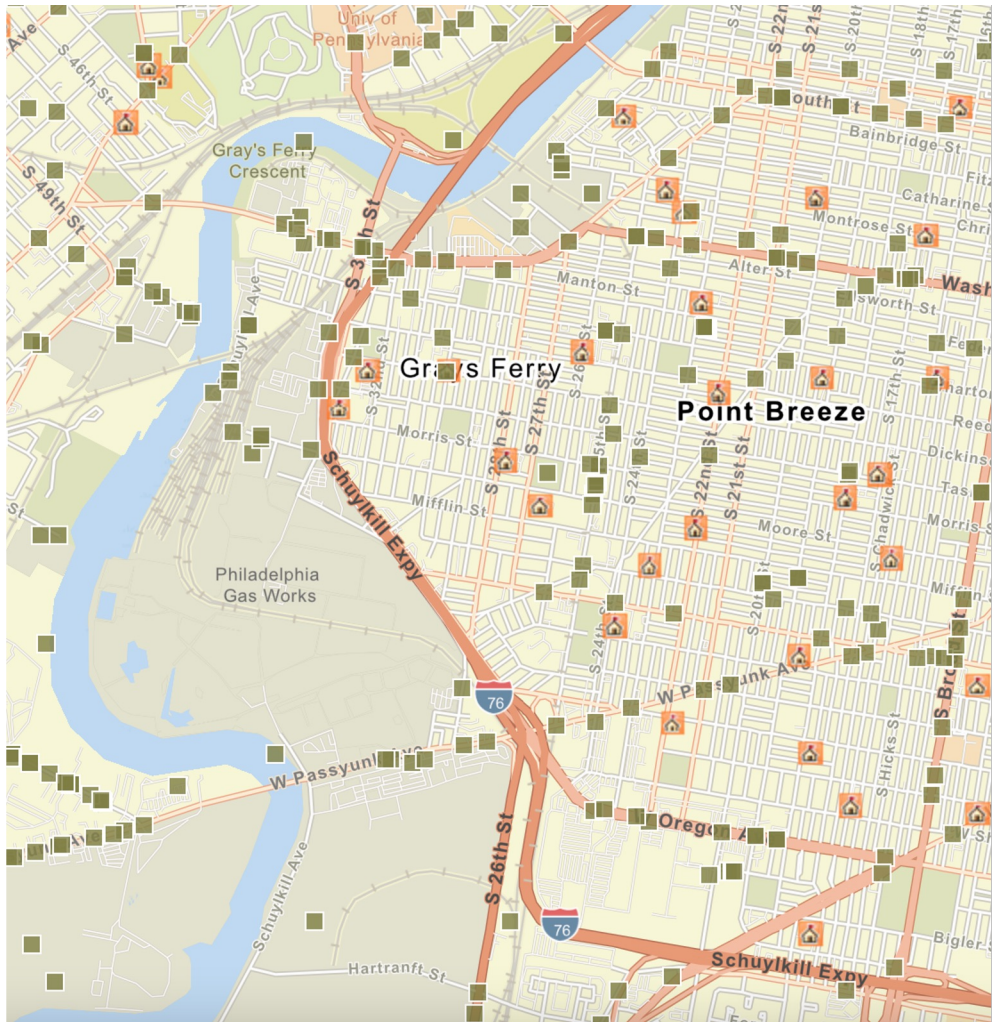
^d Non-reactive compounds, not considered to be VOC for regulatory purposes

RIT – Ritner & 24th Sts

SiteID	Facility Name	Address	2019 Emissions (tons)						
			Pb	CO	NOX	PM10	PM2.5	SO2	VOC
4210110441	LINCOLN FINANCIAL FIELD	1 LINCOLN FINANCIAL FIELD WAY	0.000	1.274	2.686	0.120	0.120	0.011	0.147
421010147	CITIZENS BANK PARK/PHILA	1001 PATTISON AVE	0.000	2.470	2.840	0.210	0.210	0.021	0.170
4210110029	KINDER MORGAN POINT BREEZE TERM/ PHILA	6310 PASSYUNK AVE	0.000	0.127	0.151	0.012	0.012	0.001	16.858
4210101501	PHILA ENERGY SOL REF/ PES	3144 W PASSYUNK AVE	0.008	373.252	581.274	63.383	63.383	65.846	575.338
4210101517	PES/SCHUYLKILL TANK FARM	3144 W PASSYUNK AVE	0.000	1.163	0.435	0.019	0.019	0.019	81.482
4210104921	PHILA GAS WORKS/PASSYUNK PLT	3100 W PASSYUNK AVE	0.000	2.228	3.117	0.262	0.206	0.092	0.358
4210101507	SUNOCO LOGISTICS/BELMONT TERM	2700 W PASSYUNK AVE	0.000	8.830	3.540	0.000	0.000	0.036	13.190
4210102148	CLEAN EARTH OF PHILA LLC/PHILA	3201 S 61ST ST	0.000	0.000	0.000	0.150	0.020	0.000	1.950
4210108016	CONSTITUTION HEALTH PLAZA / PHILA	1930 S BROAD ST	0.000	0.360	0.554	0.023	0.019	0.014	0.030
4210104009	TRANSFLO TERMINAL SERVICES INC/PHIL	3600 MOORE ST	0.000	0.022	0.089	0.404	0.007	0.001	0.042
4210105009	PBF LOGISTICS TERM 51ST/PHILA	1630 S 51ST ST	0.000	0.000	0.000	0.000	0.000	0.000	1.407
4210104942	VICINITY ENERGY SCHUYLKILL STATION	2600 CHRISTIAN ST	0.000	3.250	58.100	0.790	0.790	1.550	0.450
4210104944	GRAYS FERRY COGEN PARTNERSHIP/PHILA	2600 CHRISTIAN ST	0.001	18.410	223.400	15.080	15.080	3.700	0.600
4210110357	VICINITY ENERGY EFFICIENCY	2600 CHRISTIAN ST	0.000	0.040	2.900	0.300	0.300	0.150	1.380
4210104904	EXELON GENERATION CO/SCHUYLKILL STA	2800 CHRISTIAN ST	0.000	0.427	3.281	0.170	0.019	0.006	0.014
4210108069	CHILDRENS HOSP OF PHILA/ PHILA	34TH & CIVIC CENTER BLVD	0.000	14.119	27.485	2.963	2.963	0.929	2.738

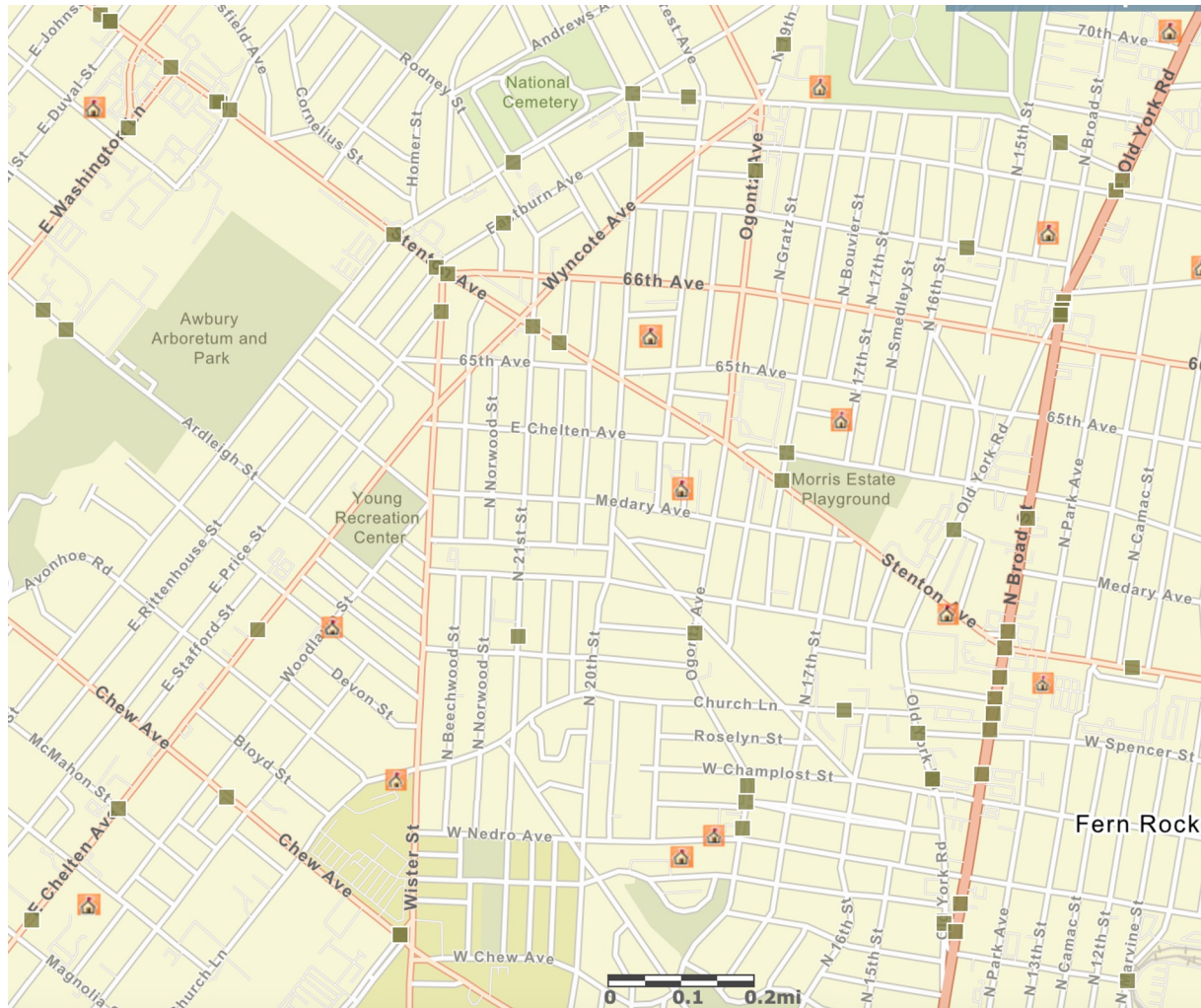


Annual Average PM2.5 Values ($\mu\text{g}/\text{m}^3$) by Planning District



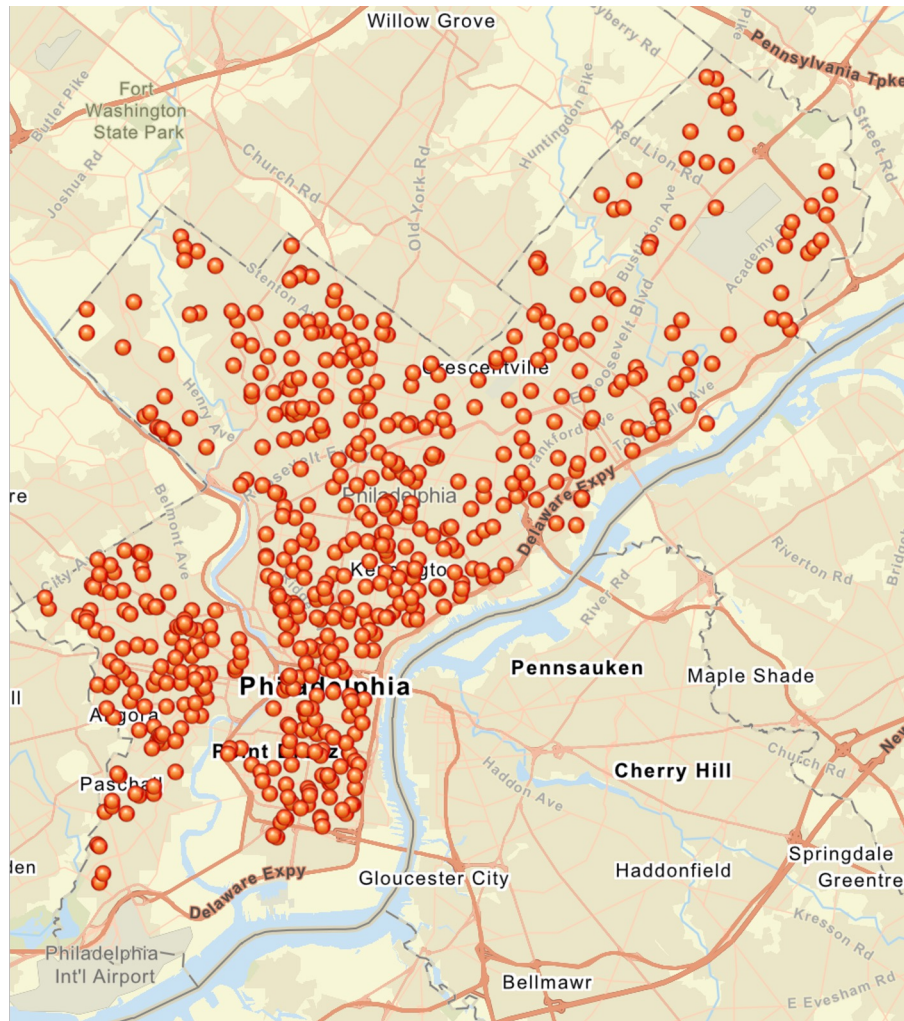
Enviromapper

Sites Reporting to EPA
Schools in Vicinity



Enviromapper

Sites Reporting to EPA
Schools in Vicinity



EnviroMapper Schools in Philadelphia