



VISIONING THE REUSE OF THE PHILADELPHIA ENERGY SOLUTIONS REFINERY COMPLEX

A CHARRETTE BRIEFING BOOK

**CLEAN AIR COUNCIL
LINDY INSTITUTE FOR URBAN INNOVATION AT DREXEL UNIVERSITY**

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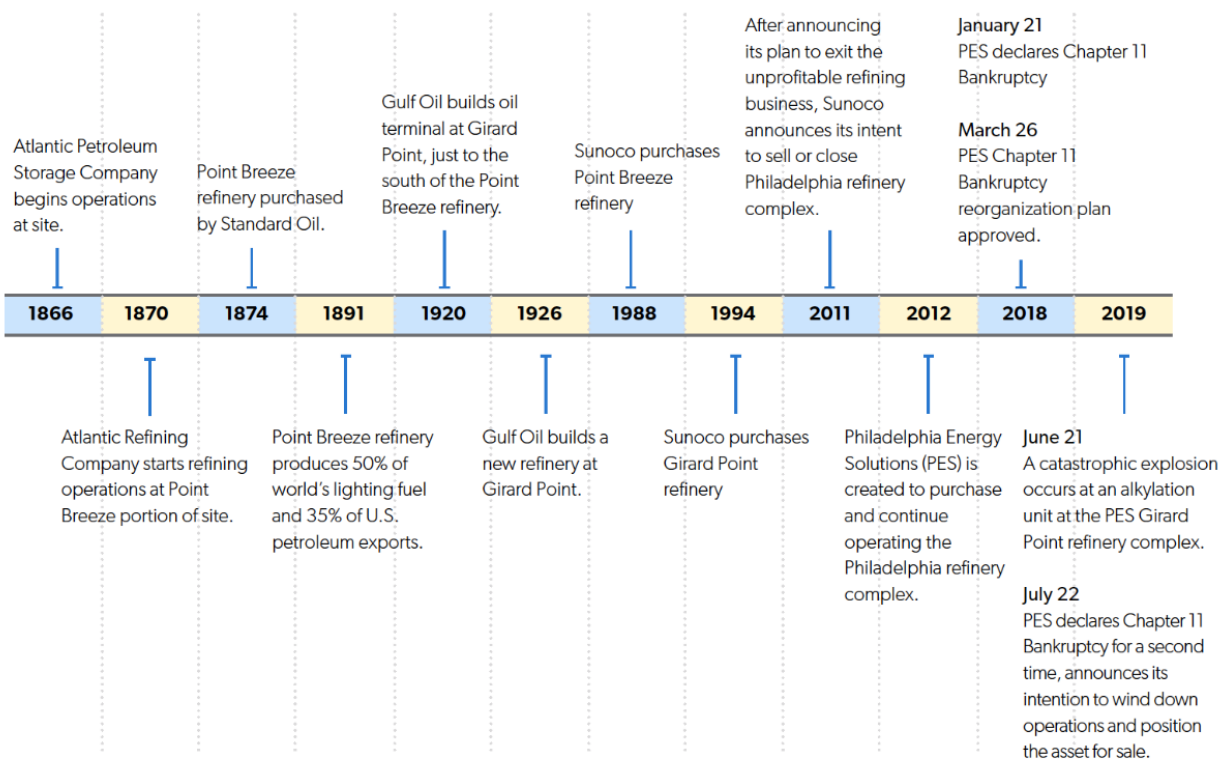


INTRODUCTION

Background

The Philadelphia Energy Solutions Refinery is sited on several parcels spanning approximately 1300 acres on both sides of the lower Schuylkill River. Now the largest petroleum refinery complex on the East Coast, the site has undergone multiple ownership changes in its recent history, although petroleum refining uses have existed

onsite since the mid 1800s. The complex includes two separate refineries that totaled a production of 335,000 barrels of crude oil per day. Operations permanently ceased following a pipe rupture and resultant explosion on June 21, 2019.



The Philadelphia Refinery: A Business History

The above timeline, from the City's Refinery Report, illustrates the past 150 years of the site's ownership by private petrochemical industries. The long history of refining creates significant hurdles to the site's reuse (Abernathy and Thiel 2019, 12).

Opposite: an aerial view of the parcels comprising the refinery site, overlaid in orange, in context along the lower Schuylkill River in south/southwest Philadelphia. PES's holdings encompass an area of approximately 1300 acres, with some sources reporting up to 1400 acres when including refining uses on adjacent parcels.

A Close Call and an Uncertain Future

Following the explosion on June 21st, the city convened a working group focused on the future of the PES Refinery site. The Refinery Advisory Group, made up of representatives from several sectors including business, community, labor, academics, environment, and city government, convened six public meetings to gather input from various stakeholders. The central charge for the Refinery Advisory Group was information gathering, and the group pursued several research agendas to gain a clearer understanding of the impact of the refinery's closure, environmental damages related to its operations, and the potential future uses of the site. Following this process, the group's co-chairs, Brian Abernathy (Managing Director for the City of Philadelphia) and Adam Thiel (Fire Commissioner and Director of Emergency Management), published a report entitled "*A Close Call and an Uncertain Future: An assessment of the past, present, and next steps for Philadelphia's largest refinery,*" summarizing



the information presented to the Refinery Advisory Group. Though a majority of the report is dedicated to information sharing, the co-chairs also included some broad, initial recommendations.

The key takeaways of these recommendations are excerpted here:

Guiding values for future use of the site

Puts the public's safety as a top priority. Risks and hazards to the public should be minimized to the greatest extent possible in every aspect of how the site is used.

Has a more positive impact on public health and the environment than the status quo ever had. Air, soil, and groundwater pollution from the site should be minimized and ***remediated and operations should be more environmentally friendly than ever before.***

Provides ***significant long-term economic benefit*** to Philadelphia and its residents, including through high quality, family sustaining jobs. The site should be put to a productive use that is financially viable and creates high quality employment opportunities.

Provides direct community investment and engages meaningfully with surrounding communities. Future users should ***work collaboratively with surrounding neighborhoods to ensure that there is openness, transparency, trust, and positive impacts across the fence line*** – including through community benefits agreements or targeted job training or hiring initiatives. Future users should listen and respond to community concerns.

Provides for diverse uses/activities on the 1,300+ acre site. Regardless of how it is used in the future, the site is large enough to ***accommodate more than one use.*** The site's size should be utilized to support as many economically, socially, and environmentally positive activities as possible (Abernathy and Thiel 2019, 35). ”

“ Mechanisms for city influence

Economic Incentives. Much of the refinery site is enrolled in Pennsylvania’s Keystone Opportunity Zone (KOZ) program, which is designed to encourage business activity and investment at specific sites that are abandoned, vacant, or underutilized. Properties and businesses located within KOZs pay little to no state and local business taxes for a defined period of time. The City may submit an application to the State seeking extension of KOZ benefits subject to authorization for specific parcels by both City Council via legislation and the School District of Philadelphia Board of Education via resolution. Any extension of KOZ benefits would be conditioned upon continuance of the PILOT agreement. While the KOZ program is the most robust incentive program at the City’s disposal, the City also has a range of additional discretionary economic development incentives it can use to encourage business growth and development within the City, including Tax Increment Financing (TIF) or grants and forgivable loans. These programs can be utilized to encourage business activities that align with the City’s values and vision.

Infrastructure Assistance. Much of the 1,300-acre refinery site currently exists as large tracts of privately-owned land that are fenced off with relatively few

connections to the City’s roadway or infrastructure network. If the future of the site is conducive to a range of activities, it is likely that parcels of the site may either require subdivision or the construction of additional infrastructure like streets, water, sewer, or river access to improve connectivity to the rest of the City. Should this situation occur, the City could leverage its infrastructure to help support the development of uses that support the City’s values and vision. Should the City decline to assist with building this type of infrastructure, the onus to provide it would be on the property owner.

Targeted Assistance for Specific Initiatives. The City may also be able to exert influence to encourage certain uses on the site in a more targeted way than offering tax breaks or building roads. For example, the City has substantial purchasing power that could be leveraged to encourage the development of green energy. The City, therefore, could enter into a power purchase agreement to encourage the development of solar or wind energy on portions of the site, or agree to purchase biofuels for use in municipal vehicles. The City can also offer targeted workforce development assistance through its partner agencies like Philadelphia Works to ensure that future users of the site have access to the trained workforce they require (Abernathy and Thiel 2019, 31). ”



Opposite: The cover of the City’s Refinery Report released by the Managing Director’s Office and Department of Emergency Management. Above: View of the Refinery Site with Center City in the background. Photo credit: Elvert Barnes.

Key Facts of City's Power Over Reuse Process

- *The refinery site is privately owned and controlled.*
- *The refinery site is involved in a bankruptcy proceeding.*
- *Zoning changes cannot prohibit a future refinery or mandate a change of use for the site – at least in the short term.*
- *The refinery's infrastructure has not been upgraded to the most state of the art technologies due to a lack of investment from recent operators.*

The PES site is privately held, which affects public control over the site's future. Private ownership and control severely limits the City of Philadelphia's ability to direct the current owner's sale conditions. The City can assume an advising role, but cannot administer actual terms. Eminent domain is a possibility but not feasible, as it would require a full market value reimbursement to the owner and would saddle taxpayers with the extreme ongoing costs of site remediation (Abernathy and Thiel 2019, 12).

PES is in the midst of finalizing bankruptcy negotiations and the sale of the site to a bidder.

The most direct decider for the future of the refinery site is the conclusion of bankruptcy proceedings. The resulting purchaser or purchasers of PES and its assets, and accompanying satisfaction of involved creditors, will determine the immediate next phase of site uses (as a refinery or otherwise). The bankruptcy process is conducted with the intent of returning the highest attainable value for PES creditors, and will be judged by the U.S. Bankruptcy Court accordingly. Additionally, the City is itself a creditor, and as an interested party cannot impose regulations on the possible outcomes of a bankruptcy process (Abernathy and Thiel 2019, 30-31).

As of January 22nd, 2020, *Hilco Redevelopment Partners, a subsidiary of Hilco Global based out of Chicago, emerged as the selected bidder* by the Bankruptcy Court with a bid of \$265 million. Hilco's

portfolio includes similar industrial adaptive reuse and redevelopment projects, including the redevelopment of a 3100-acre waterfront site home to the former Bethlehem Steel mill in Baltimore, and has indicated that continued refining use is unlikely to be part of their redevelopment strategy. The sale is far from final, however, as Hilco Global's bid is being challenged by PES creditors due to the fact that it was \$25 million less than the highest bidder (Maykuth 2020).

In the short term, rezoning measures are unable to prevent refining uses or mandate other land use changes. Even if the site had not been used for refining since the late 1800s, existing use alone allows continued use as a refinery if the underlying zoning is changed. In this instance, refining would simply continue as a "nonconforming" use, and would not be illegal; in fact, even expansion would be allowable. Changes in ownership would not nullify this "grandfathering," and the only process for voiding it—"abandoned" or "discontinued" use—is subject to legal hurdles. The nonconforming use must be discontinued for over three consecutive years for abandonment to be considered, but has a high threshold that includes evidence that the owner or operator of the parcel did not intend the same use for the entirety of that period. Although Hilco has indicated their redevelopment plans don't include continued refining use, they are legally entitled to continue to operate a refinery should they choose to do so (Abernathy and Thiel 2019, 30-31).

Investment in infrastructure upgrades has lagged or stopped. Like all refineries, an enormous amount of capital investment in built infrastructure is needed for regular refining operations and logistics. In addition to the continued investment required for regular maintenance of this infrastructure, innovation and upgrades are necessary for the refinery to stay current, especially as the industry recently has seen substantial shifts in regulations and crude sourcing. The PES refinery was not retrofitted to respond to these changes, and PES did not adequately invest in upgrades that would have appropriately positioned a sale of refinery assets to a new refining operator (Abernathy and Thiel 2019, 30-31).

“ In a statement, Mayor Jim Kenney said, “Though many challenges and years of work lie ahead, we are optimistic that the firm can develop this site in a way that supports the core values in the city’s recent report summarizing the work of the Refinery Advisory Group: a diverse range of uses on the site that put the public’s safety as a top priority, has a more positive impact on the environment, engages meaningfully with the surrounding communities and contributes significantly to the region’s economy.”

”

—from “New owner of PES site has no plans to continue refinery operations, city says,” January 22, 2020, WHYY

Refinery Report’s challenges for site reuse, potential near-term uses, and recommendations for city/future owner of site

Despite significant challenges to the site’s reuse, including extensive soil and groundwater contamination, damage to the petrochemical processing equipment from the explosion, the increasing flood risk from sea level rise, and the fact that a large portion of the infrastructure onsite cannot be reused for industrial activities other than refining, the city outlined several potential near-term reuses for the site. These include the following:

- Continued petroleum processing by reusing the existing infrastructure
- Alternative energy, such as biofuel refining or other forms of renewable energy
- Energy-adjacent industries that use natural gas liquids in their manufacturing and operations
- Petrochemical manufacturing and recycling
- Manufacturing, warehousing, logistics, and distribution

(Abernathy and Thiel 2019, 33-34)

Additionally, the City Report identified these next steps for the City to ensure that the public is kept better informed of public health risks, environmental remediation and monitoring, and the site’s economic long-term trajectory:

- Improve monitoring of air quality
- Increase oversight of Hydrofluoric Acid and other chemicals
- Review HazMat Response Capabilities
- Improve Environmental Impacts of the Site
- Develop clean and renewable energy
- Enhance pollution control
- Continue wastewater treatment activities
- Plan for climate resilience
- Incorporate landscaping, beautification, and public amenities
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 - Enhance pollution control
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 - Plan for climate resilience
 - Incorporate landscaping, beautification, and public amenities

(Abernathy and Thiel 2019, 36-41).

“ Philly Thrive... said it wanted assurances from Hilco there would be no refining operations on the site; that Hilco would provide funding to assist the public with technical participation in clean up plans; allow active public involvement in plans for redevelopment; and establish a quota for quality, union jobs to surrounding neighborhoods.

”

—from “‘Their timeline is aggressive’: Hilco plans to clean up polluted South Philly refinery site, city says,” January 24th, 2020, Philadelphia Inquirer

Site Analysis

Environmental

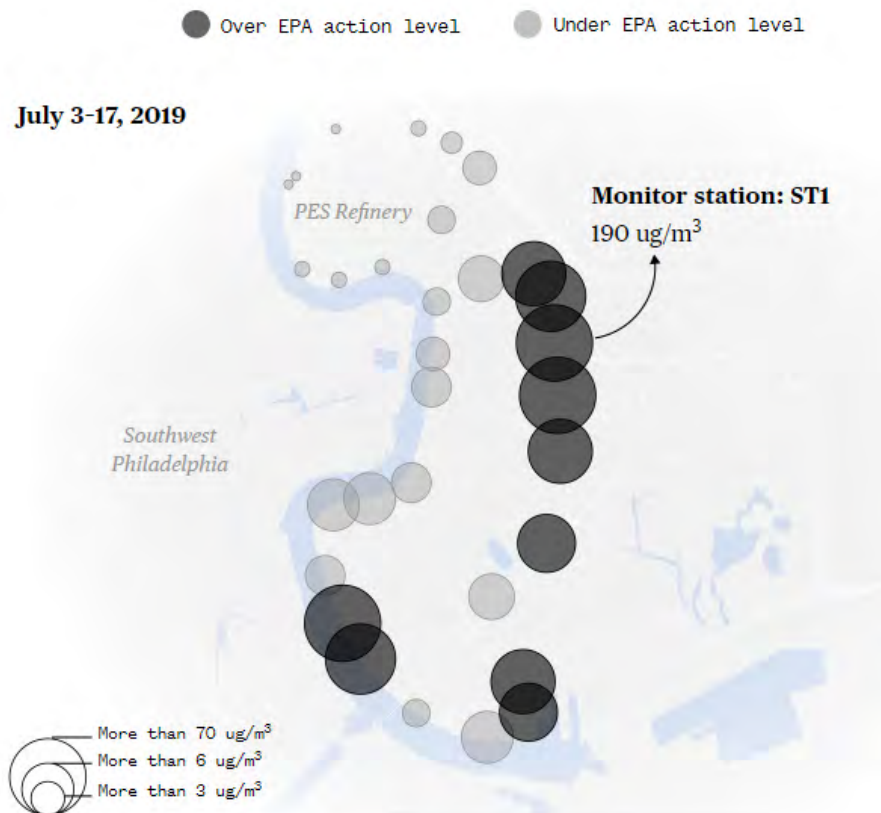
Pollution

Air Pollution. The site annually released 467,600 pounds of air toxics annually since 2014, which includes benzene and other carcinogens. 9% of the entire city's fine particle emissions and 20% of all Philadelphia's greenhouse gas emissions came from the refinery (Abernathy and Thiel 2019, 17).

- According to the EPA and as reported by Christina Simeone, the PES refinery was the 8th largest emitter of greenhouse gases in Pennsylvania and the largest, by far, in Philadelphia. As of 2014, the refinery emitted between 2.9 and 3.2 million metric tons of carbon dioxide equivalent annually (Abernathy and Thiel 2019, 21).

- According to recent investigative reporting by NBC News, E&E News, and the Investigative Reporting Workshop, high levels of benzene, a carcinogenic gas, were recorded by air monitors at the refinery fence line throughout 2019. As of September, the annual average was 49 ug/m³, more than five times the EPA action level of 9 ug/m³. Regulations require refineries to take corrective action if average annual benzene readings top 9 ug/m³. City officials were notified of the readings and received a required "corrective action plan" from PES, but the public was never informed of the potential hazard (Hiar, E&E News, Riordan Seville 2020).

Water Pollution. the refinery is still responsible for more than 5,000 pounds of water pollution annually and historical contamination remains in the ground throughout the site (Abernathy and Thiel 2019, 19).



Benzene Monitoring at PES

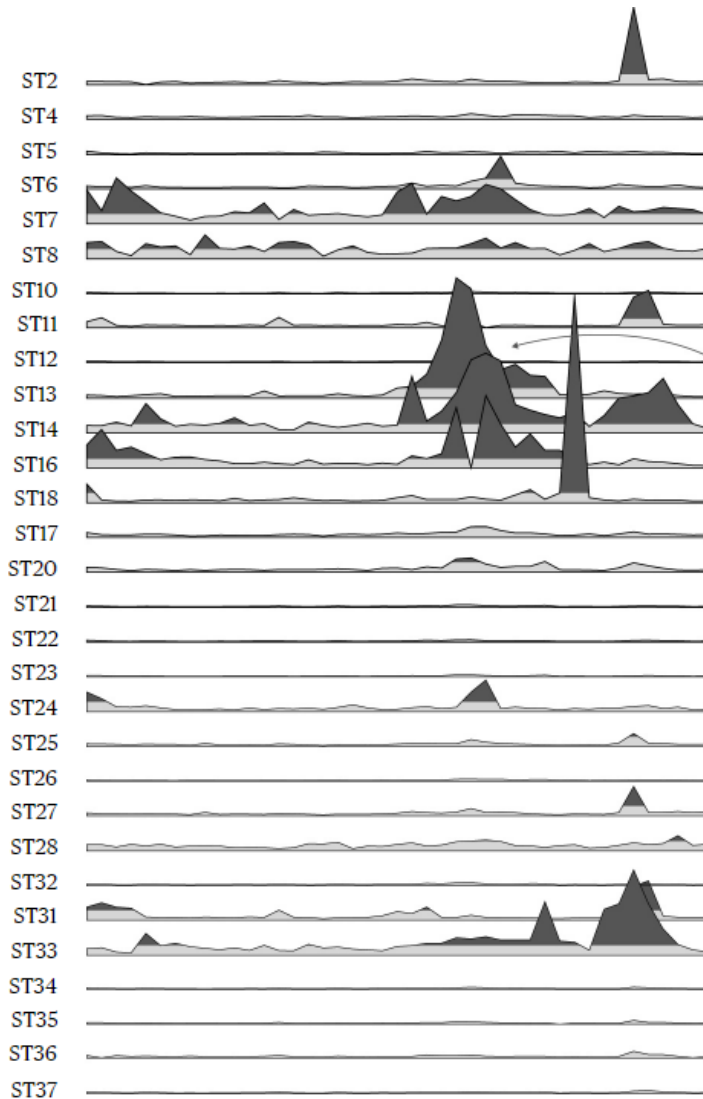
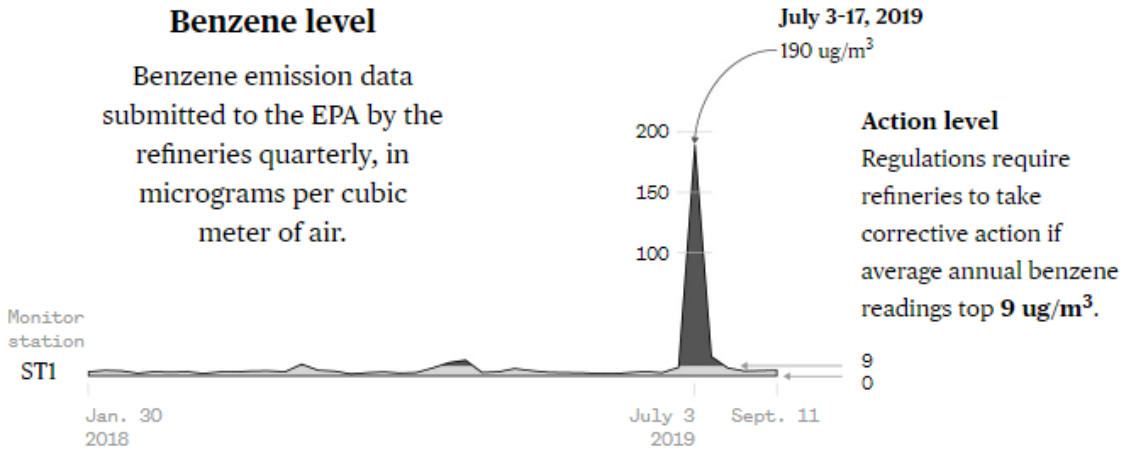
Left: Air monitors on the PES site perimeter recorded benzene levels in July as high as 190 micrograms per cubic meter (the EPA "action level" threshold is 9 ug/m³).

Right: EPA thresholds are 9 ug/m³ annual average; PES registered at 2019 average of 49 ug/m³. A series of high emissions put PES well over the benchmark.

Image Credit: NBC News, "Massive oil refinery leaks toxic chemical in the middle of Philadelphia." January 16, 2020.

Benzene level

Benzene emission data submitted to the EPA by the refineries quarterly, in micrograms per cubic meter of air.



A single high emission doesn't trigger the action, but the series of high emissions from the refinery put the facility over the edge.

Source: Environmental Integrity Project
Graphic: Jiachuan Wu / NBC News

Climate change

According to projections by the U.S. National Oceanographic and Atmospheric Administration (NOAA), portions of the refinery site are currently vulnerable to minor flooding during extreme high tides – particularly the areas near Girard Point and west of the Schuylkill River. In a future scenario with mean higher high water (MHHW) increasing by just 2 feet over current levels, portions of the tank farm west of the Schuylkill River become inundated. Increases of 3 feet over current levels are projected to significantly inundate large portions of the Girard Point section of the refinery – with flooding risks and impacts increasing with projected sea level increases. Future uses of the refinery site – regardless of what those uses are – must seriously plan for these scenarios when determining what types of infrastructure should be built, as well as where and how that infrastructure should be built on the site to minimize risks posed by flooding. Careful attention should also be paid throughout the environmental remediation process on the site to ensure that soil and groundwater contaminants are addressed in a way that minimizes the risks of contaminants migrating off-site in the event of more frequent and more severe flooding events (Abernathy and Thiel 2019, 40).

Remediation

The site's long history in the petroleum industry has led to substantial environmental contamination in the soil and ground water throughout the site. These conditions will significantly influence the range of activities that are viable or safe on the site (Abernathy and Thiel 2019, 32).

- The Act 2 remediation process will take many years and, at the time of this report, will not remediate conditions to a level that will support non-commercial development. While future owners of the site will not be responsible for remediating this contamination, the existing conditions will limit future development to industrial and commercial uses and may complicate the construction and engineering methods required to build new structures on the site (Abernathy and Thiel 2019, 33)

With the contaminants of concern identified on the PES Site, the next step before selecting remediation techniques would be to determine the future use. Current plans call for most of the refinery site to be

remediated to a site-specific non-residential standard based on the site's current and longstanding use as a heavy industrial site. Unless it is decided, and deemed technically feasible, to clean portions of the site to a higher standard, the site will likely remain in use primarily for industrial or commercial purposes in the years ahead (Bhandal, et al 2019).

Social

Residents living in fenceline communities have reported negative health impacts that they believe are related to pollution from the refinery. Philly Thrive, an environmental advocacy group leading the “Right to Breathe Campaign,” has long opposed the refinery's operations and has facilitated outreach to both community and city government to attempt to address the issues.

- Philly Thrive's 2017 #WeDecide Survey findings:
 - 33.9% of participants living near the refinery had asthma at some point in their life, compared to the national average of 7.7%
 - 52.6% of respondents living near the refinery had one or more of the following health conditions: asthma, heart disease, cancer, or another respiratory condition.
 - 82% of respondents expressed negative feelings about the PES refinery, with the top critique being that it's dangerous, a hazard and a health concern.
- The environmental burdens of living in close proximity to the refinery are disproportionately shouldered by low-income communities of color, “many of whom did not choose to reside in close proximity to an oil refinery or have the means to relocate.”
 - Of the 113, 271 people who live within 1 mile of the refinery, 60.4% are Black (a total of 77.1% are non-white) compared to the city, which is 42.3% Black
 - 38.6% of households within 1 mile of the refinery earn less than \$25K/yr, compared to 31.5% city-wide

(Philly Thrive 2019)

Economic

Cost of Closure

It is difficult to precisely quantify the cost of closure for the city's economy, in addition to the many individual employees that were laid off. Several estimates, including those generated for the city's Refinery Advisory Group, have been published since the refinery shuttered its doors.

Several sources approximate that 1,100 people were employed at the refinery at the time of the explosion. These employees worked "in a wide variety of occupations including but not limited to managers and corporate executives, refinery operators, rail car unloaders, tank field operators, laboratory technicians, scale operators, warehouse staff, mechanics, and skilled trades" and "earned approximately \$107,000 per year, on average." An economic analysis prepared by Econsult Solutions (commissioned by the Refinery Advisory Group) found that PES directly employed 1,950 full-time employees, paying \$237 million annually in salaries and wages. The company's expenditures totaled more than \$1 billion annually (Abernathy and Thiel 2019, 14-15).

The city-commissioned analysis valued the PES refinery's economic impact for the city at \$2.1 billion. When including jobs indirectly supported or induced by PES operations, the job count rises to 6,300 full-time jobs in Philadelphia, accounting for \$600 million annually in employee compensation. Finally, the analysis estimated that "the PES refinery had a total annual tax impact to the City of Philadelphia of \$33.2 million, and a tax impact to the Commonwealth of Pennsylvania of \$30 million (while also accounting for the refinery's KOZ status)." This data was not based on actual tax data due to confidentiality issues (Abernathy and Thiel 2019, 14).

The closure of the refinery reduced refining capacity on the east coast by 28%. According to the city's report, there have been no direct fuel shortages as a result of the closure; however, the region's increasing dependence on fuel from other places (delivered by pipeline from neighboring regions) may have longer term economic and environmental implications (Abernathy and Thiel 2019, 15).

Existing Assets

Operating as a refinery, the site is bolstered by several advantages that result from its long industrial history. As outlined in the city report, there are 4 key assets: infrastructure, zoning, labor, and location.

The site currently contains extensive, specialized infrastructure for petroleum processing. Industrial operations are also supported by a wastewater treatment plant, freight rail, and a shipping port.

Current zoning (I-3) allows for the most permissible and intense forms of industrial use, so the site could be utilized in many ways without requiring a lengthy rezoning process. Any non-industrial use would require zoning changes in addition to significant remediation.

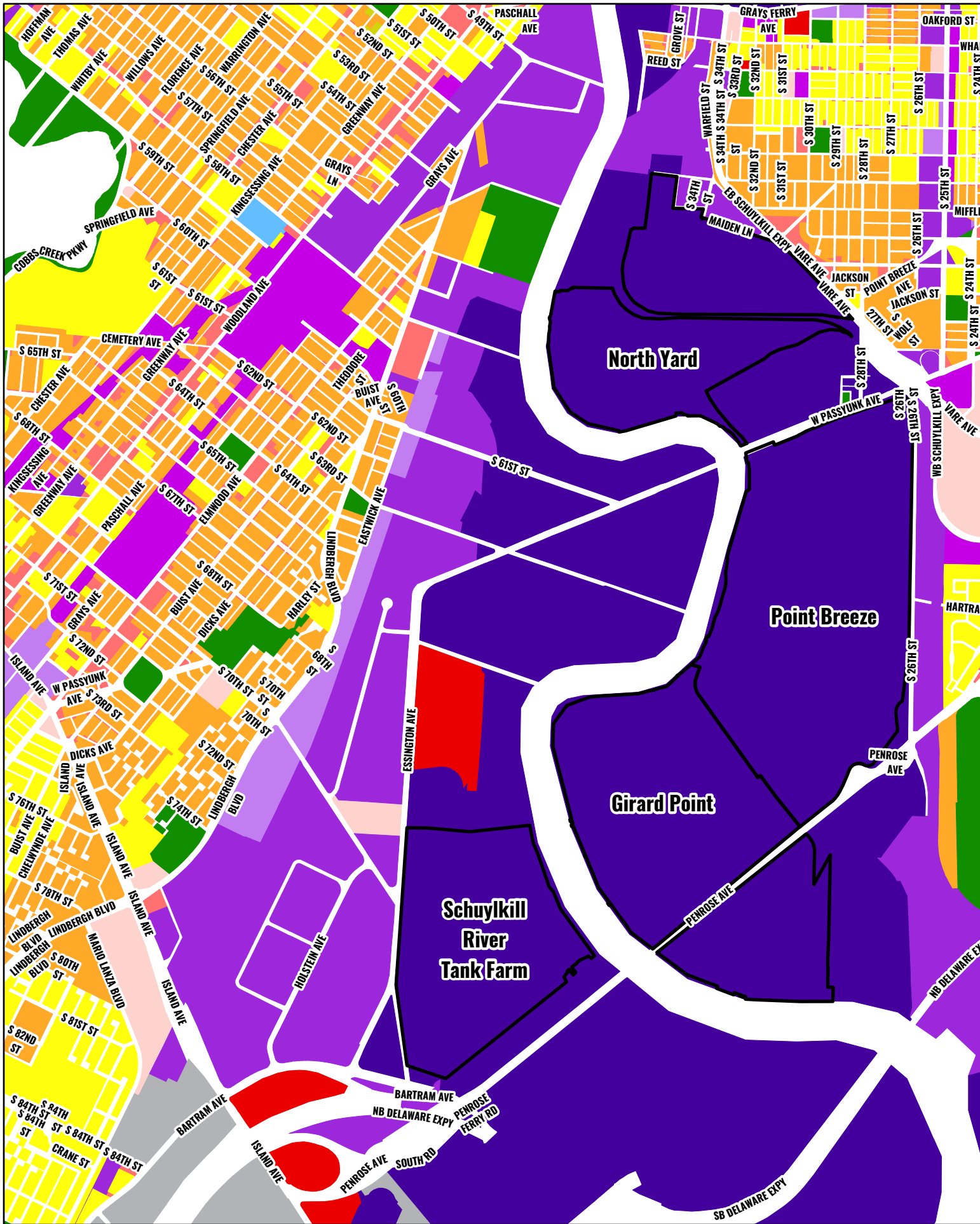
The refinery's closure and other closures in the region over the past several years means there are many local workers trained for refinery, industrial operations, and other skilled trades that are underemployed. The region is equipped with a robust workforce should industrial use continue on the site.

The refinery site is conveniently located in close proximity to the city's airport and seaport facilities, and is connected to shipping terminals by pipelines for transporting petroleum products. Situated near two interstate highways and equipped with rail infrastructure, the site has high freight capacity (Abernathy and Thiel 2019, 32).

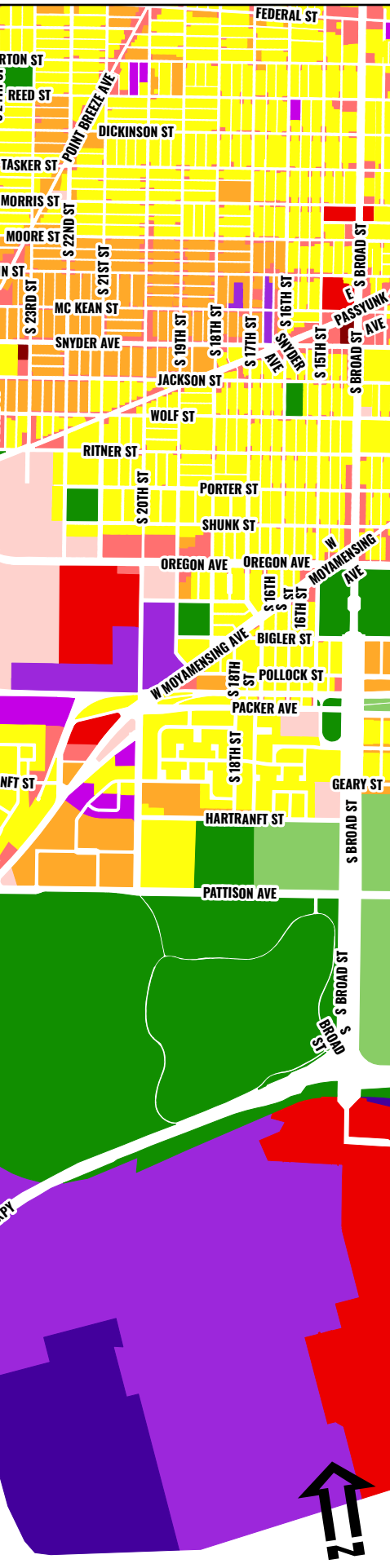
Mapping

The following pages illustrate the PES site in context in regards to key characteristics impacting the site's long-term reuse. These maps include:

- Existing Zoning
- Existing Land Use
- FEMA Flood Plains
- NOAA Projected Sea Level Rise
- Economic Development Incentives & Features



EXISTING ZONING



PES Parcels

Zoning Base Districts

- CA-1, Auto-Oriented Commercial-1
- CA-2, Auto-Oriented Commercial-2
- CMX-1, Neighborhood Commercial Mixed-Use-1
- CMX-2, Neighborhood Commercial Mixed-Use-2
- CMX-2.5, Neighborhood Commercial Mixed-Use-2.5
- CMX-3, Community Commercial Mixed-Use
- CMX-4, Center City Commercial Mixed-Use
- CMX-5, Center City Core Commercial Mixed-Use
- I-1, Light Industrial
- I-2, Medium Industrial
- I-3, Heavy Industrial
- I-P, Port Industrial
- ICMX, Industrial Commercial Mixed-Use
- IRMX, Industrial Residential Mixed-Use
- RM-1, Residential Multi-Family-1
- RM-2, Residential Multi-Family-2
- RM-3, Residential Multi-Family-3
- RM-4, Residential Multi-Family-4
- RMX-1, Residential Mixed-Use-1
- RMX-2, Residential Mixed-Use-2
- RMX-3, Residential (Center City) Mixed-Use-3
- RSA-1, Residential Single-Family Attached-1
- RSA-2, Residential Single-Family Attached-2
- RSA-3, Residential Single-Family Attached-3
- RSA-4, Residential Single-Family Attached-4
- RSA-5, Residential Single-Family Attached-5
- RTA-1, Residential Two-Family Attached-1
- RSD-1, Residential Single-Family Detached-1
- RSD-2, Residential Single-Family Detached-2
- RSD-3, Residential Single-Family Detached-3
- SP-AIR, Airport (Special Purpose)
- SP-ENT, SP-ENT, Entertainment (Special Purpose)
- SP-INS, Institutional (Special Purpose)
- SP-PO-A, Active Parks and Open Space (Special Purpose)
- SP-PO-P, Passive Parks and Open Space (Special Purpose)
- SP-STA, Sports Stadium (Special Purpose)

Data Source: Philadelphia Department of Planning and Development

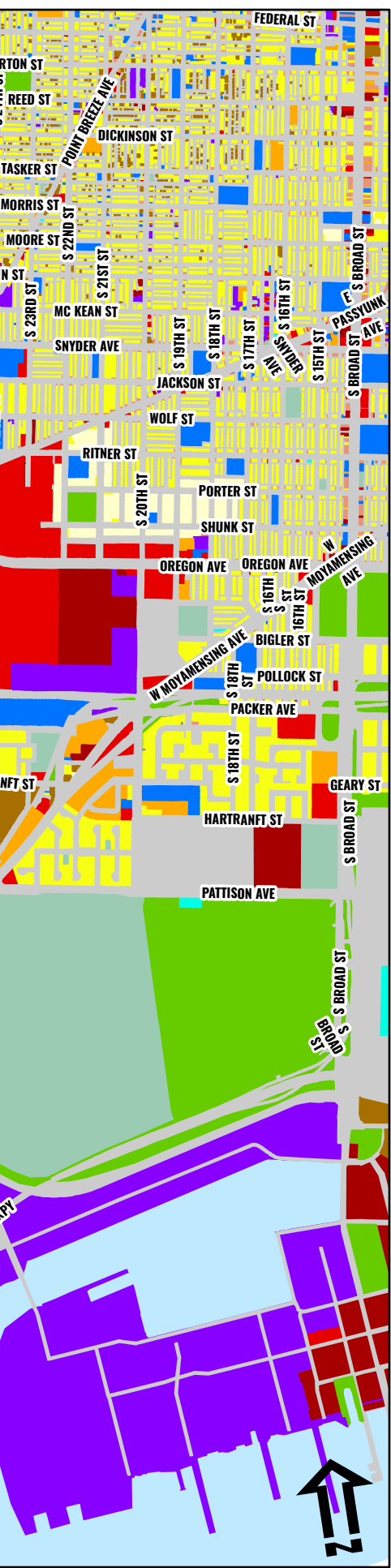


EXISTING LAND USE

□ PES_Parcels

Land Use




- Residential Low
- Residential Medium
- Residential High
- Commercial Consumer
- Commercial Business/Professional
- Commercial Mixed Residential
- Industrial
- Civic/Institutional
- Transportation
- Culture/Amusement
- Active Recreation
- Park/Open Space
- Cemetery
- Water
- Vacant
- Other/Unknown
- Other



Data Source: Philadelphia Department of Planning and Development

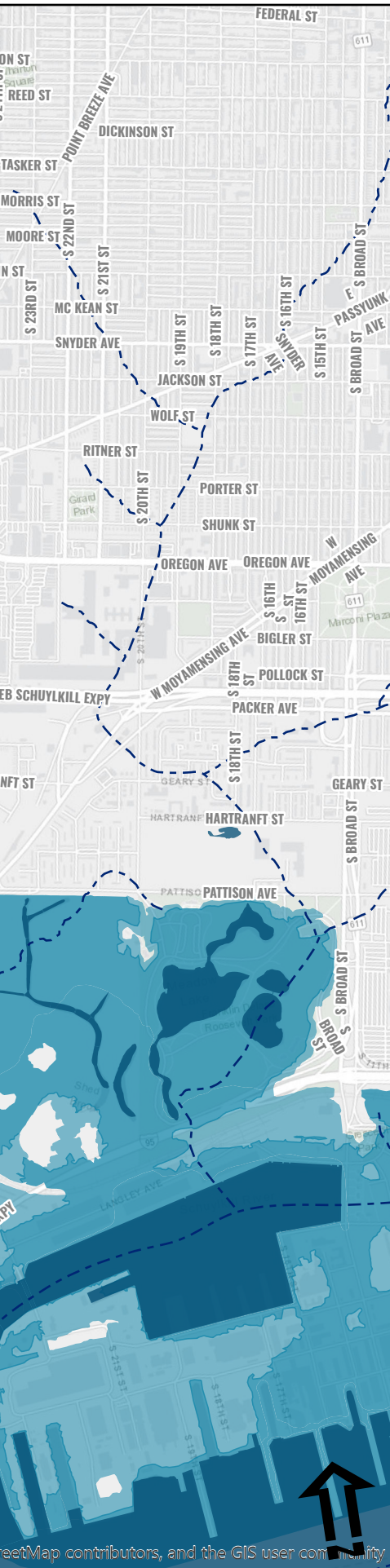


HYDROLOGY: FEMA FLOOD MAPPING

-  PES Parcels
-  Hydrologic Features
-  Historic Streams

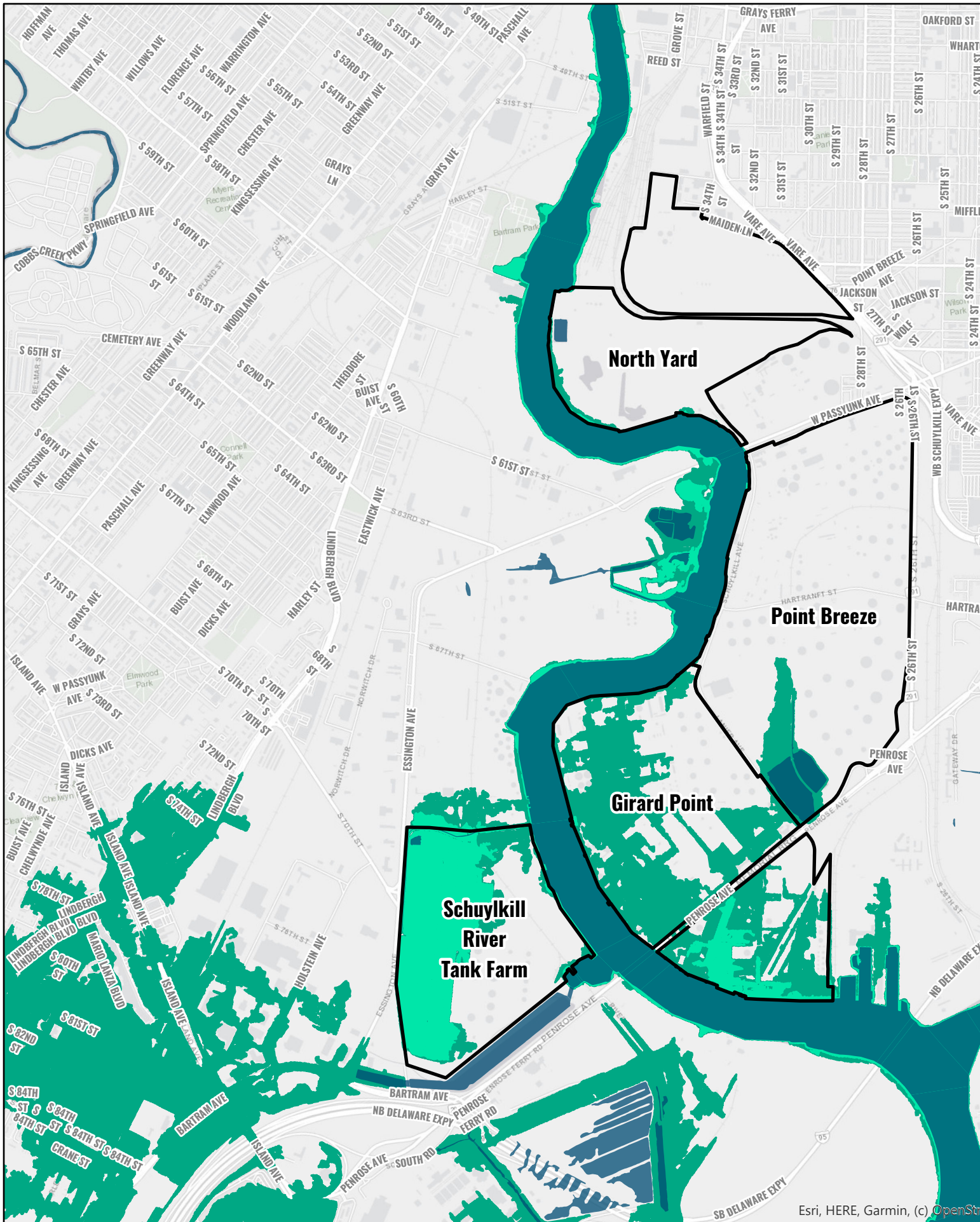
FEMA Flood Plains

-  100 Yr Flood Plain
-  500 Yr Flood Plain



Data Source: Federal Emergency Management Agency






HYDROLOGY: PROJECTED SEA LEVEL RISE

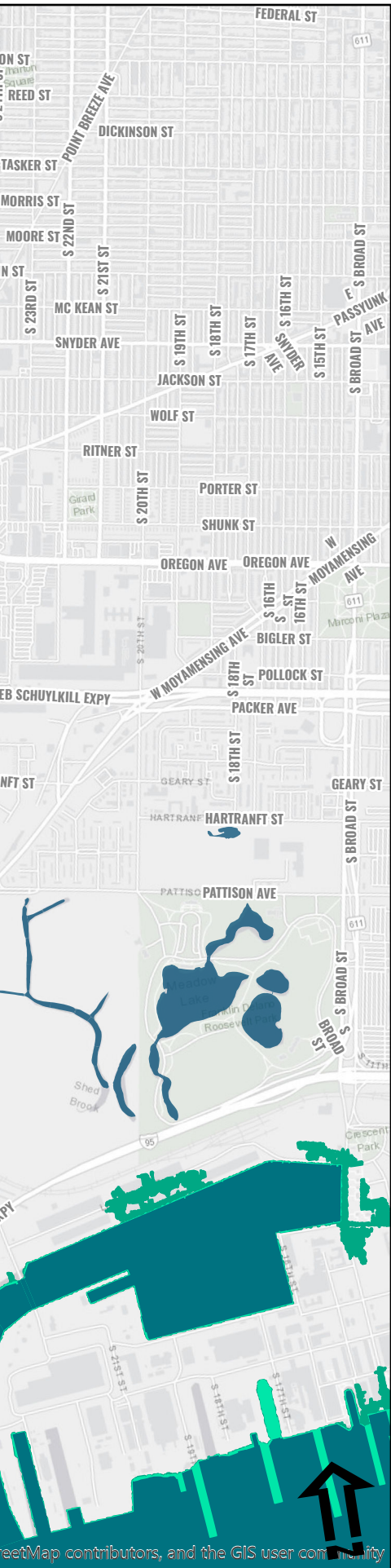
 PES Parcels

 Hydrologic Features

Sea Level Rise

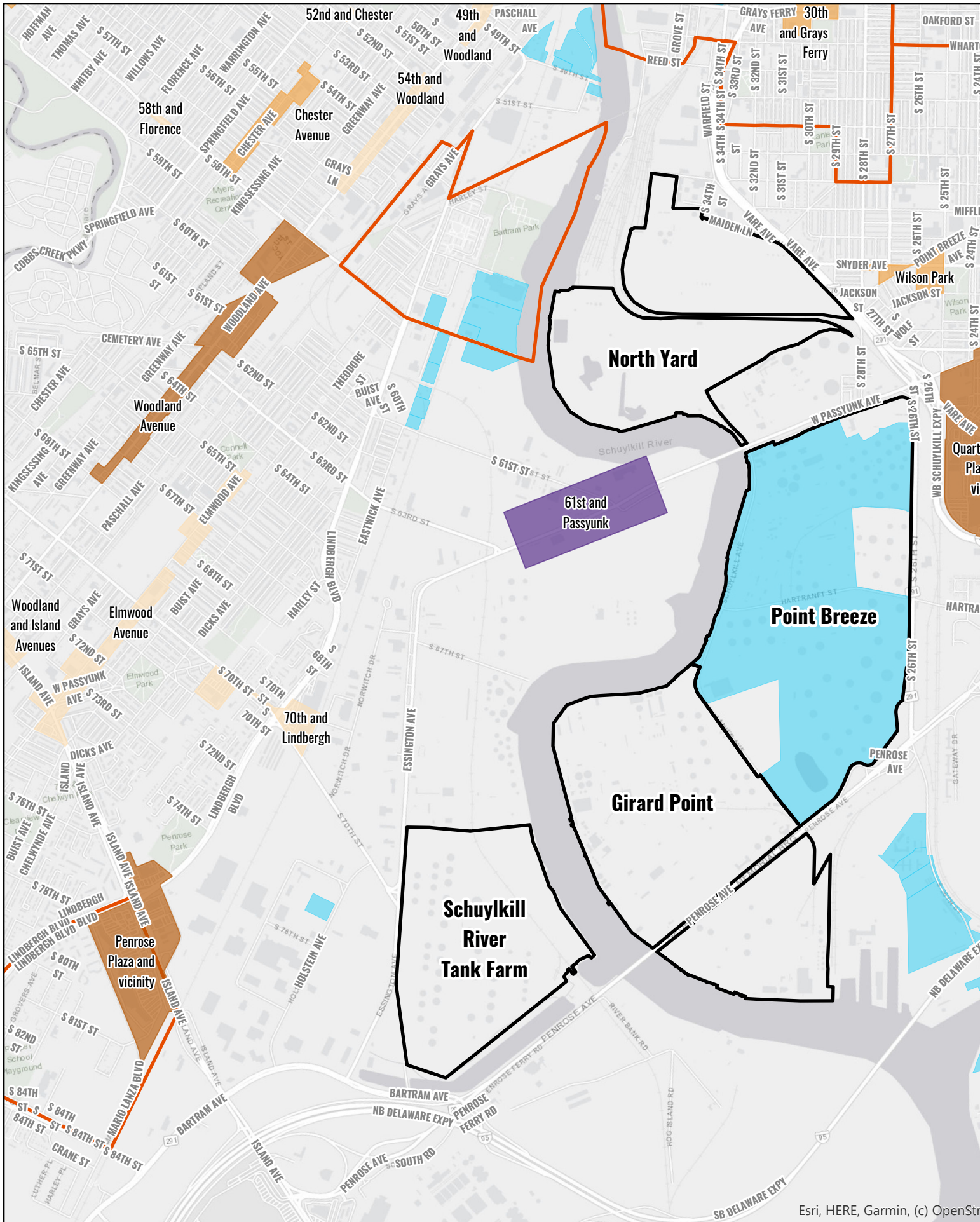
 Yr 2050 2 ft (approximate estimate)

 Yr 2100 4 ft (approximate estimate)



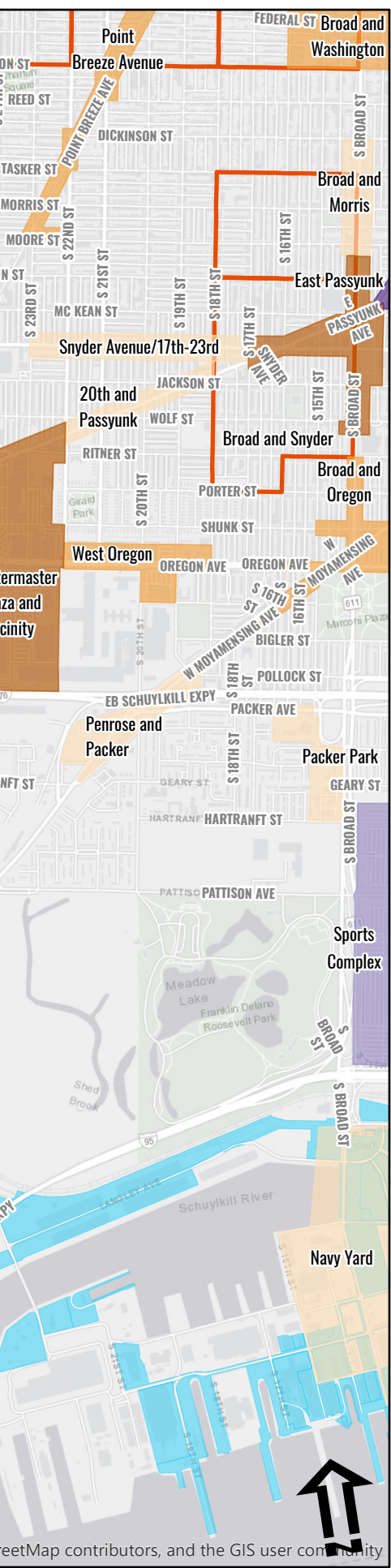
Data Source: National Oceanic and Atmospheric Administration





ECONOMIC DEVELOPMENT: FEATURES AND INCENTIVES

-  PES Parcels
-  Keystone Opportunity Zone Parcels
-  Federal Opportunity Zones
- Commercial Corridors**
-  Neighborhood Subcenter
-  Neighborhood Center
-  Community Center
-  Regional Center
-  Super-regional Center
-  Specialty Center
-  Undefined



Data Source: Philadelphia Department of Planning and Development







SURVEY RESULTS

Overview

The Lindy Institute for Urban Innovation and the Clean Air Council partnered to administer a survey with the goal of gathering public input on future uses and the long-term trajectory of the refinery land. The survey was distributed broadly through the Lindy Institute and Clean Air Council's email lists, through partnering organization outreach, and in coordination with Philly Thrive. The 3-question online survey was made available beginning on November 25, 2019 and the results included here encompass all responses collected through January 21st.

The survey was distributed online, and we recognize the barrier to access that that presents to many Philadelphians, including some living in fenceline communities. To offset this, the Clean Air Council conducted in-person surveys using the same questions in Southwest Philadelphia; however, in-person responses have not yet been incorporated into the results that follow.

Survey Response Summary

Total complete responses: 135

Survey dates: 11/25/19 - 1/21/2020

Most common Zip Codes:

19146 (15), 19145 (13), 19147 (13), 19103 (13),
19119 (10), 19104 (9), 19130 (9), 19143 (8)

Total responses from Zip Codes along Lower Schuylkill (19143, 19145, 19146):

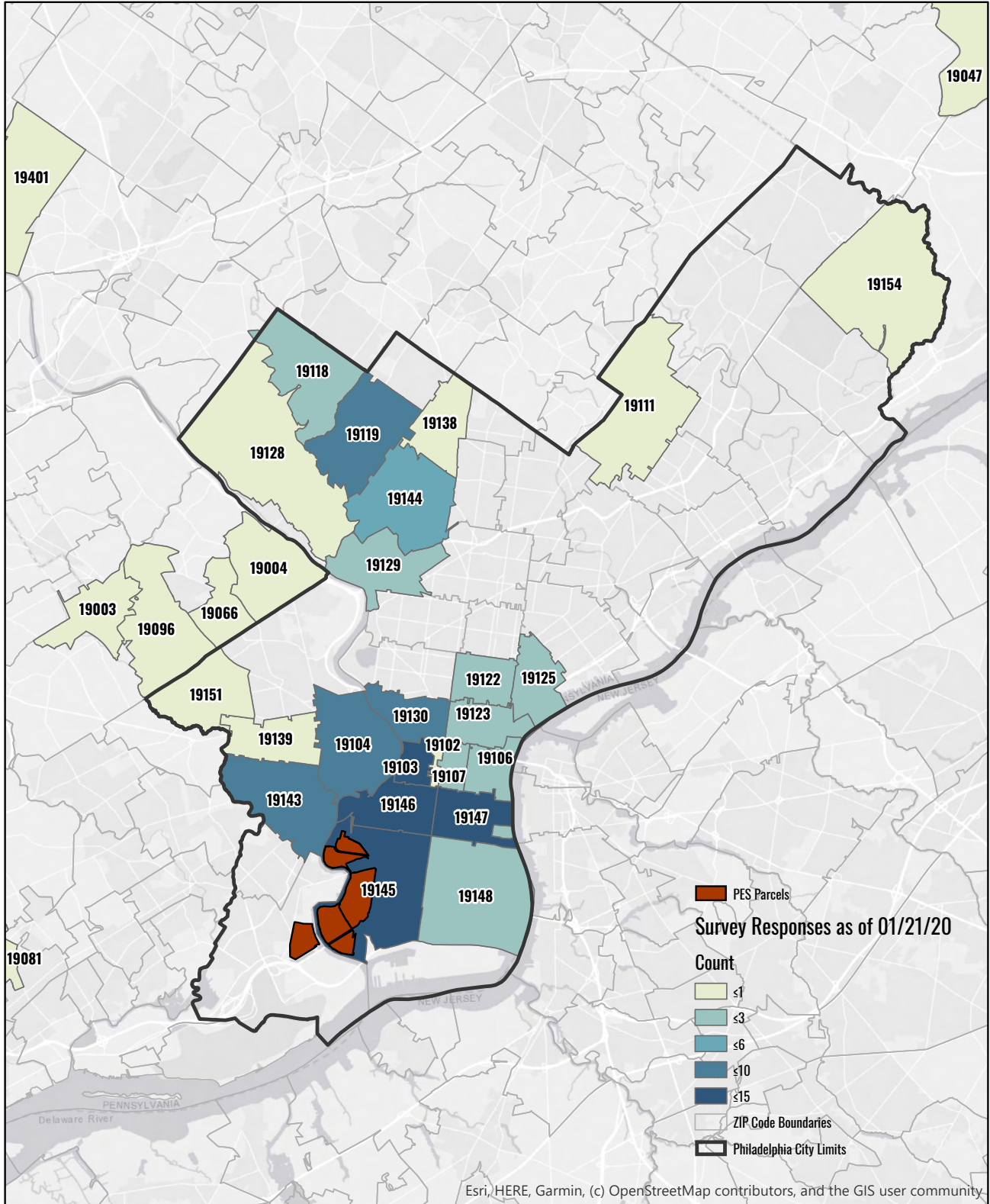
36 (27% of all respondents)

Survey Questions:

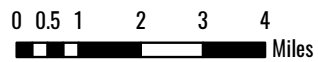
Q1-What are the most important aspects of your ideal neighborhood?

Q2-Imagine it's 50 years from now. In the best case scenario, how has the Philadelphia Energy Solutions (PES) refinery site changed?

Q3-Given your answers to the above questions, how would you like to see the 1,300 acres of PES refinery land used in the future? (You can include multiple types of uses).



COMMUNITY SURVEY RESPONDENTS BY ZIPCODE



Q1-What are the most important aspects of your ideal neighborhood?

Overall, the responses were very consistent, with nearly all mentioning one or more of the following themes. Specifically, 4 themes stood out:

50% of respondents mentioned walkability (count=68)

30% of respondents mentioned safety (had multiple meanings relating to health, environmental, and public safety) (41)

27% of respondents mentioned cleanliness (36)

22% of respondents mentioned public transit (30)

Common themes:

- Access to greenspace / trees
- Walkability/bikeability
- Transit access
- Safety - clean air/water, low crime, bike lanes, pedestrian-friendly
- Jobs - green, fair wage
- Diverse businesses / commercial corridor
- Public amenities - libraries, rec centers, good public schools
- Cultural and socioeconomic diversity
- Food access
- Aesthetics - good design, art
- Connections with neighbors
- Affordable housing

Points of contention:

- Many desired a reduction in vehicular traffic/dependence on cars, while some identified street parking as a priority.
- Several people mentioned urban density, while a couple specifically desired single-family homes.

Representative Quotes:

“A neighborhood that prioritizes people. Walkable, bikeable, and transit friendly. Mixed uses of residential and retail commingled.”

“A great public school; a good public park; racial and economic diversity; food markets; tree-lined streets; people out on the streets day and night.”

“My ideal neighborhood will be is habitable 25, 50, 100, 200 years from today. I won't get sick from living there, and, in fact, living there may increase my life span because it is a peaceful, enriching place. [It] has a deep sense of its own history; it is demographically representative of the city-at-large; it is a multicultural space that prioritizes, elevates and serves the formerly-incarcerated, immigrants, people of color, people of all genders; it is safe (this is the kind of safety that comes from a shared community responsibility as opposed to a fear of authority or an economic or a cultural homogeneity); it is easy access to public resources (transportation, green spaces, education and cultural centers, libraries, health care, rehabilitation); there are employment opportunities that do not require expensive or exclusive trainings or certifications as barriers-to-access.”

Outliers:

“Irrelevant question. The area is not a “neighborhood” in any meaningful sense. It is an industrial wasteland.”

“At this time, having a source that we are confident is giving us correct information about our air quality. We have been getting mixed or no messages since the explosion on 6/21. Philadelphia not having the 3rd highest cancer rate in the country.”

Q2-Imagine it's 50 years from now. In the best case scenario, how has the Philadelphia Energy Solutions (PES) refinery site changed?

Again, responses were largely consistent, with green energy, transit connectivity, environmental remediation, and greenspace/river access being among the most popular elements of respondents' predictions. Many felt that, realistically, the site will be underwater in 50 years due to climate change.

Common themes:

- Green/clean energy & jobs
- River access
- Transit-connected (particularly to regional rail lines)
- Environmental remediation
- Park and/or recreation space
- Balance of development and greenspace
- Wetlands/forestlands
- Not polluting
- Connected to surrounding communities
- Research campus (biotech, environmental science, life sciences)
- Supporting existing residents
- Underwater/ flooding
- Sustainable/green development

Representative Quotes:

"The varied wetland, moist upland environments have been restored; dedicated open space for passive and active recreation; renewable power with biomass harvesting and soil carbon sequestration occurs; soft rather than hard flood protection due to rising sea levels is the basis for all land use plans; mix of commercial educational and residential uses outside the predicted flood levels. Land surface and atmospheric temperature neutrality. A health monitoring and treatment fund is set up to compensate and care for victims of land and air pollution in the area that have occurred in the past 100 (taking into account the 50 years back from today) years."

"I would love to see this transformed into a large park or recreation facility. As many residents in South Philly will tell you, we certainly do not have enough green space. I would love to have a waterfront trail go all the way up the Schuylkill so we can have a healthy way to connect to different parts of the city."

"The site is remediated and is repurposed. The current purpose of the site, oil refinery, is both harmful to the nearby communities and the environment. If the industrial aspect of the site is to remain, then a renewable energy facility would be great. A mixture of parks and a renewable energy facility. Providing the nearby communities with some green parks and areas is important."

It is important for the PES site to be repurposed into something more sustainable and friendly to its nearby communities and environments. Successful repurposing and transition will become a great precedent for other refineries and fossil fuel industries throughout the world."

Q3-Given your answers to the above questions, how would you like to see the 1,300 acres of PES refinery land used in the future? (You can include multiple types of uses).

76% of respondents (count=102) envisioned multiple uses for the site (as opposed to single-use). Of the types of use listed, nearly all fell into 11 categories: park or greenspace, residential, retail/commercial, clean energy/manufacturing, solar and/or wind farm, industrial, wetlands and/or forestlands, river access, education/research, transit, and cultural facilities. Frequencies of each type are listed in the chart below. Other proposed uses were: return to the Lenape people (count=2), airport expansion (1), and use as a city recycling facility (1).

Representative Quotes:

“The PES site is an incredible opportunity for Philadelphia to transition away from a single monolithic oil corporation to a diverse ecosystem of industrial companies which can be far better economically for the city and better environmentally for the surrounding neighborhoods. Due to the fact that much of the river edge south of Pattison Ave will most likely be underwater by the end of the century, environmental remediation efforts should be focused on this area in order to allow for it to transition to a more natural environment which will help protect the rest of the site. As this is going on, the northern sections of the site should be reintegrated into the urban street grid, with some care taken to allow for the occasional large industrial site. The main focus of this should be to open up the land uses to a variety of uses which could support multiple industrial uses and allow access to the river. Creating connections through I76 and 26th St will be difficult though.”

“The varied wetland, moist upland environments have been restored; dedicated open space for passive and active recreation; renewable power with biomass harvesting and soil carbon sequestration occurs; soft rather than hard flood protection due to rising sea levels is the basis for all land use plans; mix of commercial educational and residential uses outside the predicted flood levels. land surface and atmospheric temperature neutrality. A health monitoring and treatment fund is set up to compensate and care for victims of land and air pollution in the area that have occurred in the past 100 (taking into account the 50 years back from today) years.”

Other quotes:

“The fence-line community must be centered and have first say as to how this is developed. That has to include being given the resources to bring in the best (non partisan) advisors who can expand their range of options. The process must allow the community to educate itself to what is possible and desirable for them and have the power to implement its vision. It is not acceptable that they just be fed a ‘choice’ between a few predetermined options offered to them from “above” and driven by politics as usual.”

“Get PES to remediate the site and return it to representatives of the Lenape people.”



CASE STUDIES



The 85 km Emscher Landscape Park (highlighted in yellow and green) within the Ruhr region.

Emscher Landscape Park Ruhr, Germany

Emscher Landscape Park is an 85-kilometer (53 mile) industrial heritage trail in the Ruhr region of Germany. What was once Germany's "rust belt" and site for coal mining and steel production for over 150 years, now serves as a public space with indoor and outdoor sites scattered along the trail. Relics of the area's industrial past—spoil tips, disused pithead towers, blast furnaces, and gasometers serve as a reminder to visitors of what the site once was.

At the heart of the park system is the Emscher Park Cycle Trail that runs over former railway tracks,

riverbanks, and woodland paths. Along the path of the trail, the park's natuescape is easily accessible. As nature began to forest on, around, and along the abandoned infrastructure, various plants and animals adapted to their new environment, eventually calling it home. Alongside these sites, other notable attractions include the Beckstraße Tip, The Garden of Memories, a memorial to the Duisburg Inner Harbor, and North Duisburg Landscape Park.

Emscher Landscape Park has projects that are still a work in progress, including the ecological improvement of the river Emscher system as it was once used as the region's open sewer space. Also, in the works is the landscape redesign in New Emscher Valley, a new urban water landscape with attractive parks.

Top: Tetraeder, an climbable sculpture at the Beckstrabe Spoil Tip. A spoil tip is a mound of excavated fill leftover from mining operations, and are a frequent occurrence along the Emscher Landscape Park, where they act as points of interest and overlooks for the area.



Middle: Lunen Lakeside Park, a 60 hectare area formerly the site of heavy mining operations. The landscape is now a key node and public space along the Emscher Trail.



Bottom: Garden of Memories, an installation by artist Dani Karavan in the Altstadtspark, a portion of the Emscher Landscape Park near Duisburg.

Photo credits: <https://www.danikaravan.com/portfolio-item/germany-garden-of-memories/>

https://www.researchgate.net/publication/335967426_The_impact_of_post-industrial_areas_transformation_on_people%27s_activity_on_the_example_of_Emscher_Landscape_Park_in_Germany

http://81.47.175.201/PE_Sta_Perpetua/attachments/article/75/Emscher.pdf



Shanghai Houtan Park Shanghai, China

The 34.5 acres of land Shanghai Houtan Park now occupies is a former brownfield, previously owned by a steel factory and shipyard that left the environment of the site severely degraded. Used as a landfill, construction and industrial debris was scattered and buried throughout the site. The Huangpu riverfront, where the park is located, was highly polluted, making it unsafe for any kind of recreation and devoid of aquatic life.

The objective to the former brownfield's design, led by landscape architecture firm Turenscape, was to create a green space for the 2010 Shanghai World Expo that demonstrated impactful green technologies. The space

went on to become a permanent public space/park and attraction, winning the ASLA Award of Excellence for General Design. The overall design of the park is inspired by the fields of Chinese agriculture—terraces reminiscent to Shanghai's agricultural heritage before industrial development were made to break elevation from the water's edge to the road and to slow runoff directed to the stream in the constructed wetland.

A wetland was constructed with various plant species in mind to treat and absorb contaminated and polluted water from the Huangpu River. Aside from being the water's healer, the wetland acts as a flood protection buffer between flood control levees. The park's former concrete floodwall was replaced with a habitat-friendly riprap, allowing native species to grow along the riverbank and protecting the shoreline from erosion.



Toxic industrial uses have been replaced by an interactive public showcase for wetlands and heritage agriculture.



Top: A granite wall separates portions of the site from the constructed wetlands, acting as a flood protection buffer.



Middle: Reuse of recycled steel panels, such as this arbor, and existing infrastructure (in the background) are intended to give a nod to the site's industrial past.



Bottom: The Huangpu River, formerly considered unsafe for swimming and recreation, now boasts new recreational uses.

*Image credit: Turenscape
<http://landezine.com/index.php/2011/02/shanghai-houtan-park-by-turenscape/>*



Aerial view of Freshkills Park under construction.

Freshkills Park Staten Island, New York

Freshkills Park will be the largest park developed in New York City since the 19th century, turning what was once the world's largest landfill into a sustainable and public green space. The site spans 2,200 acres, nearly three times as large as Central Park. New York City turned the former wetland into a landfill in 1948 and by 1955, was the world's largest. The site closed under local pressure with support from the EPA and stopped accepting trash in the beginning of 2001, but reopened to accept debris following the events of September 11.

In 2001, the New York City Department of City Planning held a design competition to find a landscape

architecture firm to design the park. In 2003, Field Operations was selected and hired to produce the master plan that was released in 2006.

When renovation began in 2008, Freshkills Park was sectioned off into five different spaces—the Confluence (the link of all four parks), South Park, East Park, West Park, and North Park. Each space will have different primary areas, programming, and recreational activities. Since 2012, Schmul Park, Main Creek Wetland Restoration, Owl Hollow Fields, and the New Springville Greenway have all reached completion and are open to the public. Much of the park are still in design or planning stages, like South Park and East Park, respectively. North Park is now in Phase 1 of construction and is expected to open in 2020. The park is expected to reach completion in 2036.

Top: Crews of workers at the landfill in 2001, when it reopened briefly to accept debris from Ground Zero after 9/11.

Middle: Owl Hollow Fields, a 20 acre site, was completed in 2013 and is a part of the landfill to park narrative of Freshkills.

Bottom: Schmul Park was completed in 2012 and is one of Freshkills' early successes.

*Photo credits:
Michael Falco
The Freshkills Park Alliance*



Shell Haven Refinery, now DP World London Gateway Essex, UK

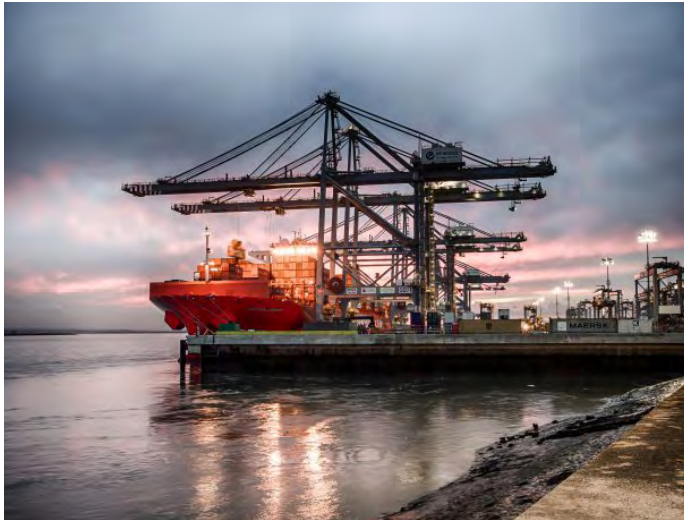
In 1999 and after 80 years of operation, Shell Haven Oil Refinery, located on the north bank of the River Thames, was closed, decommissioned and demolished. In 2006, the site was purchased by DP World, a marine terminal operator, and was redeveloped as DP World London Gateway, a new major deep-water port that is able to handle the biggest container ships in the world and logistics park. The site sits on the UK's largest industrial development space, spanning 560 acres.

The company largely focuses on practicing sustainability; London Gateway's global program, "Our World, Our Future," brings sustainability and diversity into every aspect of the corporation's work and workforce. In October 2019, the integrated logistics hub won awards in Supply Chain Engagement and Carbon Reduction categories given by The Planet Mark. According to reports from The Planet Mark, the port reduced its carbon emissions by 24.9% per TEU (twenty foot equivalent unit container) from 2017 to 2018.

DP World London Gateway's development started in 2010, saw partial completion, and opened in November 2013. The port is linked on a weekly basis with 51 countries and over 90 ports throughout the globe. The development of the port brought 12,000 new jobs and will benefit the local and regional economy.



The World London Gateway Logistics Centre at the deep water container port on the former Shell Haven refinery site.



Top: A warehouse at the DP World London Gateway under construction.

Middle: A container ship is loaded at the Gateway's cargo port.

Bottom: The port takes advantage of its proximity to its regional connections and logistics hub.

*Photo credits:
DP World London Gateway*



Industrial reuse followed remediation at Hilco's Tradepoint Atlantic site. Photo credit: Hilco Redevelopment Partners.

Tradepoint Atlantic Baltimore, Maryland

Tradepoint Atlantic is a 3,300 acre logistics and distribution center with maritime development and rail access located on the shores of Chesapeake Bay. The logistics hub, formerly Sparrows Point (and owned by Bethlehem Steel in 1918) was the world's largest steel and iron making facility and shipyard. The former steel site closed in 2012 and was purchased in that same year by Hilco Redevelopment Partners, who is also the winning bidder of the PES refinery auction.

In 2013, remnants of the steelsite were demolished and recycled for use by the future site. In 2014, Tradepoint Atlantic signed agreements with the U.S Environmental Protection Agency and the Maryland Department of the Environment remediate and clean up the pollution the steel making site left behind.

Since the acquisition of the land, around 4,000 jobs have been brought to the area and a projected 20,000 jobs will be brought to the site. Big name distribution center tenants include Amazon, FedEx, Volkswagen, BMW, and Under Armour. Full development and completion of Tradepoint Atlantic is expected by 2025.

La Mède Biorefinery

Châteauneuf-les-Martigues, France

La Mède refinery, under French energy company Total, ceased crude oil refining in 2016 to repurpose itself as a biorefinery. The conversion project launched in 2015 and the new biorefinery began producing biofuel in July of 2019.

La Mède has the capacity to produce 500,000 tons of biofuel and biodiesel per year. The biorefinery is designed to produce and process biofuels from various oils— oils are made from 60% to 70% sustainable vegetable oils: rapeseed, palm, and sunflower oils. The remaining 30%

to 40% will be sourced from treated waste: animal fat and used cooking oil. In keeping with their promise of sustainability, all oil processed will be certified to meet European Union sustainability standards.

Next to the redevelopment of the refinery that named La Mède Europe's largest biorefinery, the site also houses a logistics and storage hub for diesel, gasoline, jet fuel, and heating oil that contributes to the activity of the Marseille Fos Port. An Adblue (an additive that reduces nitrogen oxide emissions from diesel engines in trucks/ vehicles) production plant was set up on the site, as well as a training center that is able to train more than 2,000 people a year.



Solar arrays help power new biorefining production at La Mède. Photo credit: MAN Energy Solutions.





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