



**CITY COUNCIL COMMITTEE ON RESILIENCY AND WATERFRONTS AND
COMMITTEE ON ECONOMIC DEVELOPMENT**

**SARAH DOUGHERTY, SENIOR PROGRAM MANAGER, WATERFRONT
ALLIANCE**

April 23, 2021

Thank you for the opportunity to testify today.

The 520 miles of shoreline in New York City is a magical landscape of maritime recreation, a working port, and a green ecological wonder. At the same time, the many mixed uses along the shoreline paint a complicated picture. Public facilities alone include the Manhattan and Brooklyn Cruise Terminals, the Red Hook Container Terminal, city marinas, FDNY and NYPD marine facilities, shorelines and beaches, coastal and resiliency structures, waterfront parks and greenways, and dredging sites.

These sites, as well as many private facilities, play a critical role in the City's coastal resiliency and overall resiliency by providing vital services to New Yorkers. Along the water's edge, we have major utilities, transportation services like NYC Ferry, warehouses, food distribution at the Hunts Point food market and critical maritime services such as Sandy Hook Pilots and the Coast Guard. They are all subject to the increasing risks of severe storms and sea level rise.

We commend the Council's efforts to draw attention to port safety and resiliency in today's hearing. The City, through plans like the NYC Comprehensive Waterfront Plan, FreightNYC and EDC's Waterfront Facilities Maintenance Management System, as well as recent changes in the City's zoning code through Zoning for Coastal Flood Resiliency, have put forth many proposals for strengthening maritime ports and coastal resiliency. Key questions to consider are how these plans integrate or cross-reference each other and how do we measure progress when recommendations are made or reforms are instituted.

Three things could be improved:

- Interagency coordination
- Measuring progress and maintenance needs over time
- A commitment from the administration to back a collective vision for port resiliency and sustainability across the City.

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The role of the City's and region's ports are sometimes shrouded in mystery for the public and for lawmakers. The port and maritime sector is and can be an even greater 21st century economic driver while rising to meet the critical needs of local environmental justice communities. f

We applaud recent efforts by the Port Authority of New York/New Jersey to deploy more clean vehicles at Red Hook Terminal and we commend the City's efforts to create a marine terminal at Hunts Point.

But a broader vision for maritime ports and the working waterfront in New York City is absent. This means envisioning and investing in sustainable ports and working waterfronts that help to move more people and goods on the water and committing to a green port strategy. The port and maritime industry of New York and New Jersey are essential to our region and the nation's supply chain and economy, as well as the burgeoning offshore wind sector. We recently published recommendations in the Waterfront and Resilience Platform for the Next Mayor of NYC which included prioritizing:

- A focus on a five-borough green maritime port vision (i.e. offshore wind, decarbonization, electrification, ecological restoration)
- A thriving five borough ferry service
- Retaining waterfront industrial zones that foster local career pathways in green and blue jobs
- Moving more goods by water

To meet these goals, the City will need to double down on coastal resiliency reforms and investments, especially with the impacts of global warming growing more and more severe.

Turning to Intro 1679, Waterfront Alliance supports the goal of studying shoreline protection structures and advancing natural shoreline protections. Living or nature-based shorelines stabilize the shoreline and provide habitat restoration and ecosystem services, wave attenuation, improve water quality, and facilitate recreational activities like kayaking. Compared to conventional, hardened or "grey" shoreline stabilization methods, living and nature-based shorelines provide 25% more biodiversity and can reduce tidal energy, filter and reduce increased stormwater runoff, and absorb higher high tides due to sea level rise and climate change. For example, 15 feet of tidal marsh can absorb up to 50% of incoming tidal energy (NOAA).

We have also seen living shorelines can go hand in hand with many different types of waterfront facilities from parks to industrial sites. Waterfront Alliance, through its Waterfront Edge Design Guidelines ratings system,



recently verified a cement plant in the South Bronx for its innovative design at the water's edge which restored wetlands and created public access even alongside an industrial waterfront site.

As mentioned earlier, the City has released several plans that have assessed shoreline infrastructure or made recommendations regarding living or nature-based shorelines, and is in the process of adopting zoning code that will make natural shorelines easier to permit. We would like to see better interagency alignment among all these studies and plans, as well as a standard – like LEED – or guidelines by which to measure progress of the adoption of greener infrastructure.

To that end, we recommend the legislation include specific language on:

- Whether the City's existing shoreline protections align with best practices outlined with the Waterfront Edge Design Guidelines (WEDG), specifically WEDG Category 3: Edge Resilience credits and Appendix B: Shoreline stabilization and decision-making.
- That this legislation incorporate a Citywide rating or scoring system for waterfront edge resilience and ecology aligned with the best practices in the Waterfront Edge Design Guidelines (WEDG).
- AND that incentives such as expedited permitting between Department of Environmental Conservation (DEC), Army Corps, and Department of City Planning (DCP) are in place to encourage widespread adoption of naturalized shorelines.

Thank you for the opportunity to testify today.



SWIM Coalition
Stormwater Infrastructure Matters

Testimony of Michael Dulong
Senior Attorney, Riverkeeper, Inc.
Steering Committee Member, SWIM Coalition

before the New York City Council Committee on Resiliency and Waterfronts

on Intro No. 1679-A

April 23, 2021

Thank you, Chairman Brannan and Members of the New York City Council Committee on Resiliency and Waterfronts, for your leadership in pursuing a study of shoreline protection measures for all New York City boroughs. Such a study would inform resiliency planning in the face of sea level rise and increased precipitation. Therefore, **Riverkeeper Supports Intro No. 1679-A**. It is crucial that resiliency plans be just and equitable, so we submit the following comments to strengthen the study.

I. A resiliency study of all 520 miles on New York City Coastline has not occurred following Hurricane Sandy, and the need is growing.

Since Superstorm Sandy, there has not been a comprehensive five borough plan in place to protect all communities and our entire 520-mile coastline from what we know lies ahead and already see taking place in many neighborhoods: sunny day flooding during high tides, severe flooding in our streets and homes during heavy rain events, an increase in combined sewer overflow events in our local waterways, all related to climate change. During Sandy, “a staggering 51 square miles of New York City was flooded—17 percent of the city’s total land mass.”¹ Forty-three New Yorkers died. The flooding affected the homes of 443,000 New Yorkers,² many of whom are low-income New Yorkers of color, not to mention the catastrophic impact it had on businesses and critical infrastructure, all totaling \$19 billion in damages for the city.³

We are likely to see similar or worse flooding in the future as our seas are on pace to rise one foot by 2050. The National Aeronautics and Space Administration (“NASA”) predicts between

¹ N.Y. City, A Stronger, More Resilient New York, at 13 (2013), *available at* http://s-media.nyc.gov/agencies/sirr/SIRR_singles_Lo_res.pdf.

² *Id.*

³ David W. Chen, In New York, Drawing Flood Maps Is a ‘Game of Inches,’ N.Y. Times (Jan 7, 2018), *available at* <https://www.nytimes.com/2018/01/07/nyregion/new-york-city-flood-maps-fema.html>.

six inches and six-and-a-half feet of sea level rise by 2100.⁴ The New York City Panel on Climate Change has concluded that “New York City’s sea level rise is projected to exceed the global average, increasing the risks posed to New York City’s coastal populations, infrastructure, and other built and natural assets and that “total annual precipitation will likely increase, and brief, intense rainstorms are very likely to increase.”⁵

These conditions necessitate swift and strong action from the New York City Council. Planning for climate change is essential, especially for low-income communities and communities of color. The study under Intro 1679-A would identify actionable resiliency items and allow the City to prepare for and respond quickly to federal funding opportunities as they arise. These projects will mean good paying jobs for New Yorkers while improving our city for the future.

II. As currently configured, the Army Corps study will not alone address New York City’s resiliency needs.

As the United States Army Corps of Engineers New York/New Jersey Harbors and Tributaries (HAT) Study resumes, we remain concerned that, if left unchanged, it will not properly account for sea-level rise. The Army Corps recently informed Riverkeeper that it believes it has already taken sea-level rise into account in its storm surge calculations. However, the study does not address the impacts of blue sky flooding, and therefore the cost-benefit analysis will be skewed in favor of measures that address storm surge but leave our shoreline communities vulnerable to other sea-level rise impacts. The federal government’s failure to holistically consider how sea-level rise affects our region could lead to selection of designs that fail to achieve their intended purpose within their design lifetime. Therefore, it is incumbent on New York City to complete its own shoreline resiliency planning that will complement the HAT Study.

III. New York City needs a holistic coastal resiliency plan led by residents that addresses all five boroughs and focuses on social, environmental, and climate justice goals.

The study outlined in Intro 1679-A will go a long way to telling us where the city is vulnerable, where shoreline protection measures have been weakened, and where intervention may be most helpful. Yet there is much more to resiliency planning than building berms and seawalls. Locals in the city’s shoreline communities know which areas flood during storms, where precipitation tends to pool, and where blue sky flooding impacts homes and infrastructure. Those closest to the problems are also closest to the solutions. Therefore, local communities must be offered an opportunity not just to participate in, but to lead equitable resiliency planning efforts. The bill should be modified to set forth a framework for community involvement in identifying shoreline vulnerabilities and potential solutions. And as general “community engagement” does not always necessitate equitable participation from most marginalized communities, we recommend that racial equity guidelines should also be defined.

⁴ Nat’l Aeronautics & Space Agency, Understanding Sea Level; Projections, <https://sealevel.nasa.gov/understanding-sea-level/projections/empirical-projections>.

⁵ New York City Panel on Climate Change, 2015 Report Conclusions and Recommendations, available at <https://nyaspubs.onlinelibrary.wiley.com/doi/epdf/10.1111/nyas.12592>.

In addition to community involvement, Intro 1679-A should recognize and incorporate existing and prior shoreline planning efforts. To date, it is clear that New York City's planning efforts have been lopsided in favor of protecting lower Manhattan while leaving other communities vulnerable. The study outlined in Intro 1679-A would help identify the needs of those overlooked communities. Where, like in Manhattan, coastal resilience plans are currently in development, these and other existing planning efforts should be acknowledged and not duplicated so that the study can focus on areas most at risk. Intro 1679-A should also identify and incorporate, among other things, the Comprehensive Waterfront Plan and the Waterfront Facilities Maintenance Management System.

We appreciate that the bill favors living shorelines, which are one of the best ways to protect our shorelines, preserve aquatic habitat, and offer scenic settings. We must note that construction strategies alone realistically will not be able to protect all New Yorkers from sea level rise and flooding. A variety of strategies will be necessary, such as policy change; incentives and regulation; physical investments (green infrastructure, integrated flood protection, housing, managed relocation) and governance reforms. The study should allow for consideration of these other tools and identify those particularly vulnerable areas where strategic retreat should be considered among the options.

* * *

Thank you for your consideration of Riverkeeper's and SWIM Coalition's testimony. We look forward to continuing to work with the Council Members, the Office of Long-Term Planning and Sustainability and our partner organizations to ensure New Yorkers are protected against our rising waters and all climate change impacts.

Contact:

Michael Dulong, 914.478.4501, mdulong@riverkeeper.org

**New York City Council Oversight Hearing: “Port Safety and Resiliency in all Five Boroughs”
Committees on Resiliency and Waterfronts & Economic Development**

April 23, 2021

Good morning, members of the Council. Thank you for this opportunity to discuss port safety and resiliency in all five boroughs.

My name is Julie Stein, senior vice president for asset management, and with me are Andrew Genn, senior vice president for transportation, Elijah Hutchinson, vice president for neighborhood strategies, Prince Flanigan, assistant vice president for design and construction, and Jennifer Montalvo, vice president for government and community relations. I am also joined by Jainey Bavishi, Director of the Mayor’s Office of Climate Resiliency.

I will be providing an overview of the importance of our ports and waterfront to New York City and the regional economy and the essential functions that radiate from them.

In this testimony, we will highlight some of NYCEDC’s (EDC) projects as identified by the Council.

I will also put this in the context of creating a sustainable and resilient future in the face of climate change, more frequent powerful storms, and sea-level rise.

Let’s look at why this topic is so important to NYC and why we are so focused on it.

As we sit here, we are in a city made up primarily of islands and peninsulas. In fact, all told, New York City has 520 miles of waterfront -- a mix of public and private land, developed and undeveloped, industrial area and open spaces, as well as other uses. Approximately 1/3 of the waterfront is privately owned.

Water made this city great! It’s water that brought the first trading ships, which seeded the growth of a maritime industry, and opened New York to become the global center of commerce. It’s water that allowed us to distribute food from farms upstate and across the country. It’s water that beckons us to take advantage of opportunities in green energy.

In short, water is both our past and our future.

The flipside to all this: our waterfronts are vulnerable. They are subject to increased storm activity and the damage and loss of life it can bring. During Hurricane Sandy in 2012, people died, homes were destroyed, subways shut down, and power outages darkened the city.

We now know that by 2050, the city could experience 30%% more extreme precipitation events, and, on top of it, there looms the specter of sea level rise.

Because of this, it is impossible to separate economic development from our focus on coastal resiliency, sustainable energy, and alternatives in transportation.

The City established the New York City Panel on Climate Change, which takes International Panel on Climate Change projections and localizes them to New York City – providing the latest and peer-reviewed climate data at the local level.

With that research in hand, we at EDC are mapping our greatest vulnerabilities and taking bold and significant action to address them. The City is investing \$20B in recovery and resiliency projects across the five boroughs—making it one of the most ambitious urban infrastructure programs in the United States.

Strong ports are also key to our planning. They strengthen the City’s resiliency in the face of emergencies and transportation disruptions. To lower carbon emissions, we are turning to multi-modal freight transport by maritime and rail. With that said, let us look at some of these major initiatives and how we support them:

Freight NYC

Through Freight NYC, EDC is helping New York City overhaul our aging freight distribution systems through strategic investments to modernize our maritime and rail assets, build new distribution facilities, and create thousands of well-paying jobs. As the city’s population grows and consumers demand near-instant deliveries, local freight volumes will increase an estimated 68% by 2045, and, with trucks currently moving nearly 90% of freight, traffic will have nowhere to go.

The Freight NYC plan leverages the following key strategies to support modal shift and reduce the share of freight moving by truck: We are updating port infrastructure at the South Brooklyn Marine Terminal to support offshore wind facilities and other project cargo; and we are making access improvements to the city’s largest container port at Staten Island’s Howland Hook. In addition, we are forming

partnerships with maritime firms and shipping companies to move more freight by water and increasing rail freight to take pressure off our roadways.

Crucially, we are doing this with a view to decarbonize the supply chain by using zero-emission vehicles and reducing truck miles travelled wherever possible.

To give you examples, I would like to tell you how Freight NYC is investing in two key freight hubs: The South Brooklyn Marine Terminal (or SBMT) and Hunts Point.

SBMT in Sunset Park is undergoing a rebirth. The City initially invested over \$115M to reactivate SBMT as a major shipping hub to spur further development. It is now our most prominent investment to support offshore wind production. We will invest another \$57M in offshore wind-specific port improvements. Within the next few years, SBMT will support the production of 3.3 gigawatts of clean energy. This is in no small part thanks to the advocacy of Council Member Menchaca--you have continually pushed for a strong maritime industrial use at the site. With our partners, *Sustainable SBMT* and *Equinor US*, coupled with the support of the federal and state governments and local leaders, SBMT will establish New York City as a wind industry hub, strengthen the local green economy, and create a national model to support offshore wind activity.

We project over 1,200 jobs associated with the project while ensuring the local community in South Brooklyn has a direct pipeline to these opportunities through the creation of a \$5M fund to train workers in the skills they need to succeed in these jobs.

Another major hub of freight activity is the Hunts Point peninsula in the Bronx. Because Hunts Point is key to the local and regional food supply chain, EDC and the City are working with the local community to address vulnerabilities to disruption from future storms and other environmental threats.

Hunts Point is home to 12,000 residents, 18,000 workers, and the Food Distribution Center (FDC), which is the largest food distribution center in the nation. The FDC feeds the tristate area with an estimated 4.5B pounds of food distributed every year, about half of which feeds consumers in New York City. 12% of all food distributed to New York City comes from the FDC.

Using funding from HUD, we partnered with the community to launch the Hunts Point Resiliency process. Through it, we found that different parts of Hunts Point face varying risks.

The industrial area, sited in a low-lying flood plain, is vulnerable to storm surge, flooding, power outages and extreme heat. However, the residential neighborhood is at a higher elevation, subject to blackouts and heat issues but not flooding.

The study prioritized an energy resilience project, including a micro-grid, solar power and energy storage, and backup systems for residents, schools, and the FDC businesses.

In addition, we are working with the tenants to develop specialized emergency operational response plans.

And, in the long-term, we are committed to working with our FDC tenants on modernization plans to address coastal flooding risk.

Each waterfront has its unique challenges.

Lower Manhattan Coastal Resiliency (LMCR)

The historic heart of New York's waterfront is Lower Manhattan, another area which faces significant risk simply by its location. One of the largest central business districts in the country and one of the world's [densest concentration](#) of jobs is surrounded by water on three sides. This means if sea level rises to as much as six feet, which is what conservative models project, the neighborhood could be uninhabitable by 2100.

As I mentioned already, Hurricane Sandy forced the city to recognize its vulnerability.

That is why the City is investing roughly \$500M in permanent infrastructure plans to safeguard Lower Manhattan coastal areas and provide interim flood protection. The LMCR project involves four tailored initiatives to protect close to 70% of the coastline. We are examining how to extend the Seaport and Financial District shoreline into the East River to act as a flood barrier. In the neighborhood between the Manhattan and Brooklyn bridges, we are designing a system of flood barriers. We also have plans to elevate the wharf and esplanade along The Battery to strengthen the shore there; and we are coordinating with the Battery Park City Authority on the reconstruction of its waterfront esplanade.

To support many of these freight and resiliency initiatives, EDC relies on our Waterfront Rehabilitation Program.

We want to thank Council Member Vallone for introducing **Intro. 1679**, a local law related to evaluating shoreline structures around New York City. We believe this process is vital – and that is why EDC has led

a waterfront rehabilitation program for more than two decades. This program is supported by two key components: waterfront inspections and capital construction.

EDC inspects City-owned waterfront infrastructure and provides repair recommendations annually. In addition, EDC works with a wide range of city agencies to identify the critical infrastructure that needs to be assessed. That means 40 to 50 sites per year with a \$3M annual inspection budget. The key deliverables from a typical inspection are a report that details recommended repairs and cost estimates for implementing the renovations. These deliverables are used to support capital construction planning by the City. Over the course of Fiscal Years 2018 and 2019, EDC performed 80 inspections that identified approximately \$900M in recommended repairs across 150 different waterfront infrastructure systems under the jurisdiction of agencies. Of the 150 systems, approximately 45% need repairs within one to five years.

The capital construction component of the program is responsible for developing the 5- to 10-year capital plans for waterfront infrastructure under EDC's jurisdiction. The most recent capital plan identified \$250M in rehabilitation needs for EDC assets.

The Waterfront Facilities Maintenance Management System is available to help in decision-making. This tool can be found on the EDC's website. It has mapped the entire 520 miles of waterfront. It incorporates geospatial data and computer modeling to create detailed maps, and other important waterfront data compiled from EDC inspection updates. This allows EDC, city agencies, engineers, marine contractors, construction professionals, community stakeholders, and others to make efficient better-informed decisions when prioritizing waterfront assets or acting in emergencies. It also encourages greater interagency alignment.

Thank you for the opportunity to be here today. We are happy to take your questions.



ECONcrete Inc. in support of Int. No. 1679-a Evaluating Shoreline Protection Structures throughout NYC

Members of the committee, citizens and residents of New York City, and participating legislators,

We thank you for the opportunity to share ECONcrete's testimony.

ECONcrete is a sustainable concrete infrastructure company. We provide an ecological alternative to hard coastal protections. Traditional concrete infrastructures create immense pressure on shallow-water ecosystems, and are the source of 8% of global CO₂ emissions; ECONcrete regenerates marine life and is an active carbon sink.

Our resilience-building roots in NYC run deep. Since our first deployment in Brooklyn Bridge Park in 2014, we have prioritized the safety of New York City residents and ecosystems. We collaborate with the Harbor School, Billion Oyster Project, WEDG, Rise to Resilience, and the Metropolitan Waterfront Alliance. Projects on Huron St, Randall's Island, and Brooklyn Bridge Park are demonstrating ecological benefits, and winning the Rebuild by Design competition in partnership with Living Breakwaters is integral for large-scale flood protection along Staten Island. As private sector stakeholders, ECONcrete unequivocally supports this legislation, and commends the committee for their foresight and proactivity.

Int. 1679 affords a comprehensive and visionary approach to sustainable development throughout NYC's shoreline protection structures:

- By assessing the current state of the City's shoreline protection measures and identifying where protection infrastructures must be replaced, this Introduction ensures a proactive approach to reducing the impacts of seasonal flooding, erosion, and catastrophic storms.
- By analyzing if living shorelines would be a feasible replacement for traditional protections, the proposed committee will directly increase ecosystem services like flood attenuation and shelter for species, while increasing public coastal access and open space.
- Where living shorelines are not feasible, such as working waterfronts, by directing the committee to examine if environmental concrete is feasible, New York City is taking an unprecedented step towards meeting the challenge of climate change.

Int 1679 is a critical step in building protected shorelines that can also be active carbon sinks, marine habitat, local job creation, and recreational/educational sites. When environmental concrete is a default option, the city gains more natural spaces, and hardened infrastructure with co-benefits that traditional concrete protections cannot afford.



We thank this committee for hearing our testimony, and are grateful for your time and attention to this hearing process. We look forward to continuing collaborating with the City of New York towards a more resilient future.



The North Shore Waterfront Conservancy of Staten Island, Inc.
54 Port Richmond Avenue
Staten Island, New York 10302

April 22, 2021

Sponsors: Councilman Paul A. Vallone, Kalman Yeger, James F. Gennaro
Cc: Justin Brannan, Chair and to Council members Ruben Diaz., Sr., Costa Constantinides, Eric A. Ulrich, Deborah Rose of the NYC Resiliency & Waterfronts Committee

Reference: Int. No. 1679-2019, A Local Law in relation to evaluating shoreline protection structures throughout the city of New York.

Dear Councilman Paul A. Vallone, Councilman Kalman Yeger and Councilman James F. Gennaro:

On behalf of the North Shore Waterfront Conservancy of Staten Island, Inc., (NSWC/NSWCSI) and the Environmental Justice and Waterfront Communities of Staten Island's North Shore that we advocate on behalf of.

We are in favor of the above Int. No. 1679-2019. However, we must also warn you that as you are doing your study you must also include a means of remediating industrial waterfront properties that contain legacy contaminants. We have noted in other references that upon being hit with storm surges and flooding activity it can migrate those contaminants back towards the adjacent Environmental Justice Communities, thereby exposing residents to harmful chemicals.

We have included with this letter a copy of the NSWC's Environmental Justice Resiliency booklet "Shore Up Community Resilience Adaptation Project for the North Shore of Staten Island" (SUCRA). And we hope that you and those that are preparing the evaluation will find it useful and that it will help to speed this long overdue process along.

Thank you for your time and consideration.

Sincerely,

Beryl A. Thurman, Executive Director/President
NSWC



SHORE UP

**COMMUNITY
RESILIENCE
ADAPTATION
PROJECT FOR
THE NORTH
SHORE OF
STATEN ISLAND**

Cover: NYS Department of
Environmental Conservation
walking Bay Street Landings
after Hurricane Sandy: Melvin
Norris, Arturo Garcia-Costas,
and Michelle Moore.



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and New York State Department of Environmental Conservation (NYSDEC)**

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INTRODUCTION

To a large extent, we take water for granted and assume that as people we are in complete control of our environment.

However, our opinions about water can change in the blink of an eye. Water is unpredictable and underestimating its power can result in severe consequences. Something that at one point seems to be of little threat can suddenly become life threatening.



“Saving our planet, lifting people out of poverty, advancing economic growth ... these are one and the same fight. We must connect the dots between climate change, water scarcity, energy shortages, global health, food security, and women’s empowerment. Solutions to one problem must be solutions for all.”

– Ban Ki-moon, U.N. Secretary-General

“People say that if you find water rising up to your ankle, that’s the time to do something about it, not when it’s around your neck.”

– Chinua Achebe, Author

“Everything we do, even the slightest thing we do, can have a ripple effect and repercussions that emanate. If you throw a pebble into the water on one side of the ocean, it can create a tidal wave on the other side.”

– Victor Webster

Hurricanes Irene and Sandy



Basement Flooding 08.26.2011

The North Shore of Staten Island was developed quickly with little consideration for drainage. Therefore, many North Shore residential communities are still using a drainage system that is more than 65 years old.

The heavy downpour produced by Hurricane Irene in late August, 2011 rapidly saturated the ground and water began bubbling up from under the basement floors into many homes like a spring. Even homes that had never

experienced water seepage soon found they had to bail or pump themselves out.

Port Richmond was developed as a model village and its original drainage system was built in 1839. Portions of it were found by the EPA when they remediated the Jewett White Lead Company site, but the rest of the North Shore's City sewer system (Port Richmond Sewer Plant) was built in 1945 and then a newer version came in 1965.



**The Reformed Church on Staten Island
08.26.2011**

Hurricane Irene caused significant mold damage on walls of The Reformed Church on Staten Island.

Water will test your inner strength and faith that things will be alright.

Property damage sustained as a result of Hurricane Irene were never reimbursed. All that the

insurance companies did not cover in terms of damages and repairs became out of pocket costs. Hurricane Irene also weakened the root systems of many trees, which left many trees vulnerable to later topple with the arrival of Hurricane Sandy the following year. Today, residents are still trying to recover from damaged caused by both storms.



**The Bayonne Bridge Before Hurricane Sandy
07.12.2012**

Staten Island has four bridges and a ferry. Residents know that during Nor'Easters, high winds, and hurricanes all four bridges will be shut down and the ferry service will stop, leaving residents and visitors virtually stranded on or off of the island until the winds subside or the storm ends.

**The truth is, as humans,
we are only as safe as our
environment allows us to be.**

In 2013, the U.S. Coast Guard and the Port Authority of New York and New Jersey released an environmental assessment document stating that the Bayonne Bridge Port

Authority property has the following contaminants on site: polychlorinated biphenyls (PCBs), lead, asbestos, arsenic, and other heavy metals.

The Bayonne Bridge also sits among an environmental justice residential community and the former Archer Daniels Midland Company's Manhattan Project Storage Site. This site is radioactive due to a spill on the property between 1939 and 1942 of high-grade uranium ore that was used in making the atomic bomb during World War II.



The Bayonne Bridge One Day After Hurricane Sandy 10.30.2012

Staten Island has a population of approximately 479,000, with approximately 175,000 people living on the Island's North Shore and 75,000 living near the waterfront. There are approximately 45,000 low-income people and people of color living in close proximity to industrialized, contaminated waterfront properties.

Right as Hurricane Sandy's storm surge from the Kill Van Kull was about to hit, we heard an air raid siren go off from one of the waterfront businesses trying to warn us. It was the first time that any of us had ever heard this warning sound. During Hurricane Sandy,

residents living across the street from the old Archer Daniels Midland (ADM) site reported seeing the storm surge from the Kill Van Kull wash over the ADM site and the water covered the tops of the trees on the property.

They said that they saw two large police vehicles driving east on Richmond Terrace as the storm surge rushed up from the Kill Van Kull and enveloped Richmond Terrace with the water rushing west. The police vehicles made a sharp U-turn and began driving as fast as they could to get away from the storm surge of water, looking for streets that would lead them upland and away from the flood.



Howland Hook

10.30.2014

According to the Port Authority of New York and New Jersey, the Howland Hook/New York Container Terminal experienced 14-foot storm surges during Hurricane Sandy. Shipping containers were thrown around by the winds as if they were toys.

Howland Hook was closed for one week after Hurricane Sandy. Being that this is a port, it also means that food and supplies would normally come in through this port as well as, from time to time, the import and export of flammable and explosive hazardous materials and chemicals. Western Avenue, along which Howland Hook is located, was completely flooded

during Sandy. On the day after Sandy, we drove on Western Avenue and noticed that the waters were still receding from Mariners Marsh Park across the road by the overpass and out to Old Bridge Creek. Howland Hook was built on a tidal wetlands that were filled in.

Howland Hook is located at the north western tip of Staten Island and sits on tidal straits of lower Newark Bay and the Arthur Kill.



Bay Street Landings
10.30.2012

Residents living at Bay Street Landings experienced 12-foot storm surges that flooded the first floors of their buildings and pushed cars in the parking lot to the edges of the property.

the promenade and street. Bay Street Landings has one street leading to and from the site, all other egress from this below-grade property would have to be traversed by foot.

One resident said that when the storm surge came in, it only took minutes for debris from the pier and bulkhead to be pushed onto



**Front Street, Stapleton Shoreline Erosion
12.05.2012**

The unmanned John B. Caddell, a tanker, became unmoored and drifted in the Narrows before eventually becoming beached in the parking lot at Front Street, Stapleton, where it remained until it was towed away.

According to people that work along this stretch of Front Street, the area has long suffered from flooding associated with Nor'Easters. In addition, the shoreline has been eroding for some time.



**St. George, Shoreline Erosion
01.18.2013**

St. George's waterfront on Bank Street also yielded interesting results: under the blacktop was white sand. But the shoreline where residents would park their vans overnight to do night fishing were quickly eroded away during Sandy.



St. George's Waterfront at Bank Street across from Bayonne, New Jersey's Industrial waterfront

In looking at the eroded shoreline from the land, we began to wonder what the North Shore waterfront looked like from the water. More specifically, we began to wonder what kind of protections that we, as a waterfront community, have from environmental hazards that could easily be combined with man-made conditions that can become dangerous or hazardous.

Along this area of the waterfront, as the Kill Van Kull river bends, the image above shows several oil and gas tanks and a power plant in Bayonne, New Jersey. Bayonne is directly across the river from Staten Island's North

Shore. In fact, visitors unfamiliar with Staten Island often think that, when driving along Richmond Terrace, they have somehow crossed a bridge and have gone over to Bayonne because of the way Bayonne's industrial waterfront has been built out into the Kill Van Kull.

Maritimers refer to the Kill Van Kull, Lower Newark Bay and the Arthur Kill as "Chemical Alley" because of the industrial uses that line both the Staten Island and New Jersey waterfronts

The problem that the North Shore Waterfront Conservancy of Staten Island, Inc. (NSWC) has observed are ongoing



signs of rapid shoreline erosion in areas potentially effected by chemical contamination issues. This erosion can lead to the migration of toxins into the surrounding environment, including the Kill Van Kull River, which is a popular fishing destination used by residents to feed themselves and their families.

Already, the Kill Van Kull, Lower Newark Bay and the Arthur Kill tidal straits are considered by New York State Department of Environmental Conservation as Impaired Waterways, meaning that they are too polluted to be used as a food source for humans.

What is a Berm?

Berm

/bɜrm/

noun: Berm; plural noun: berms

1. a flat strip of land, raised bank, or terrace bordering a river or canal.
2. A path or grass strip beside a road.
3. An artificial ridge or embankment, e.g., as a defense against tanks.¹

However, a berm can also be a bulkhead, riprap which are pilings of rocks along the shore. It could be a jetty or levee, sea wall or break wall.

¹ "Berm." The Oxford Pocket Dictionary of Current English. 2009. Encyclopedia.com. 8 Jun. 2015 <<http://www.encyclopedia.com>>.



A Berm

(2011). Effects of sand barrier berms in Louisiana built to mitigate the effects of the Deepwater Horizon oil spill. Retrieved from <http://www.eoearth.org/view/article/51cbf04e7896bb431f6a124f>



A Jetty

(2008). Alone on a Jetty Galveston. Retrieved from <http://www.deviantart.com/art/alone-on-a-jetty-Galveston-Jan-78963471>



**Mariners Harbor, Van Name and Van Pelt Tidal Wetlands
06.13.2011**

A source of natural protection can also be wetlands, such as the recently enhanced wetlands at Heritage Park, West Brighton (not Shown). The wetlands that will be enhanced at Van Name and Van Pelt Park, Mariners Harbor.

Above, Van Name and Van Pelt mud flat with Spartina grass. Three acres of tidal wetlands and eleven acres of underwater property.



**Arlington, Arlington Marsh Tidal Wetlands and Cove
04.15.2011**

There is, of course, Arlington Marsh and Cove, 80 acres of tidal wetlands located at the northwestern corner of Staten Island, connecting the communities of Mariners Harbor and Arlington.

The residential communities that were flanked by, or surrounded by, Arlington Marsh's tidal wetlands and 107.5 acres of Mariners Marsh freshwater wetlands, as well as the wetlands at Old Bridge Creek, were not flooded during Hurricane Sandy.

Therefore, in a post-Hurricane Irene and Hurricane Sandy world, it became necessary to identify where our first line

of protection existed for the waterfront communities on Staten Island's North Shore, and whether these protections were congruent. We knew that many of the waterfront businesses along the North Shore have bulkheads, but we were unsure about their height and length.

We were also uncertain whether any of the business owners considered their bulkheads as the source of substantial protection for their properties or the residential communities behind them.

The overall consensus in terms of the bulkheads was that most properties that had



them thought of them as only being functional in the sense of using them for their particular operations and preventing the unwanted migration of their property's topsoil into the Kill Van Kull.

When hit with a severe Nor'Easter or hurricane, they would move vulnerable equipment, tools, and products to higher ground, leaving any potential loss or damages as a matter for the insurance companies to handle. As such, these business owners do not think of their properties as the first line of defense for the waterfront communities that are behind them.



New Brighton, Shoreline Bulkhead: Atlantic Salt Company 06.27.2014

It is understandable for the owners of Atlantic Salt not to consider their location as a first line of defense against storm surges because the site is below grade and the residential community of New Brighton sits above sea level. But as it was pointed out by the manager at Atlantic Salt, as Richmond Terrace and the Kill Van Kull goes west, the lower the shoreline is to the water.

Atlantic Salt's bulkhead is twelve feet above sea level at low tide and six feet above sea level at high tide. The above photo was taken during NSWC's Resiliency Expedition of the North Shore waterfront. According to Debbie

Mans, Executive Director of New York/New Jersey Baykeeper, when we were out on their skiff the Kill Van Kull was at high tide.

Possible Contaminants

The road salt product is known to have an anti-caking agent, ferric ferrocyanide (FFC). The EPA has determined that ferric ferrocyanide is one of the "cyanides" in the Clean Water Act's list of toxic pollutants^{1,2,3}. However, the EPA also stated the following regarding FFC in terms of beneficial uses:

1 <http://www.epa.gov/fedreg/EPA-WATER/2003/October/Day-06/w25272.htm>

2 40 CFR 401.15, 40 CFR 302.4, & Table 302.4.

3 <http://water.epa.gov/scitech/methods/cwa/metals/cyanide/fsffcfinal.cfm>



“Beneficial Uses of FFC – A number of industrial, consumer, and medicinal uses have been developed for FFC, including as a pigment in printing inks, paints, paper dye, cosmetics, and as an anti-caking agent in road salt. More recently, the Federal Government has announced FFC as a recommended treatment for radiation exposure and metal poisoning. The beneficial use of compounds and their classification as toxic pollutants are not contradictory. EPA recognizes that even compounds with beneficial uses can have toxic effects under certain environmental conditions.”

In sailing from Atlantic Salts property west past Snug Harbor and on to the restaurant Blue there is virtually no Berm protection along the waterfront.

Areas and streets inundated during Sandy include: Snug Harbor Greenway, the wetland area of Snug Harbor, Lower Kissel Avenue, a section of Delafield Place, Amelia Court, a section of Wales Place and small section of Linden Street, and Richmond Terrace from Bard Avenue to almost Davis Avenue.



**Snug Harbor Cultural Center Waterfront: Shoreline Erosion
06.27.2014**

According to staff, during Hurricane Sandy, the floating dock at Snug Harbor's waterfront was taken during the storm surge and pulled out into the Kill Van Kull where it floated about one and a half miles before sinking in the river. A good portion of the waterfront at this location also experienced shoreline erosion.



**Livingston, Shoreline Riprap: Blue Restaurant Waterfront
06.27.2014**

Blue Restaurant has riprap along their waterfront but even this may not be sufficient enough to protect their business and or the residential community across from them on Richmond Terrace. In addition it does not run concurrent with any other properties on either side of it. During Sandy, all properties along the North Shore waterfront flooded.



**Livingston/West Brighton, Shoreline Erosion: Gas Station
06.27.2014**

There is no shoreline protection at all on this property's waterfront and during Sandy it was underwater.



**West Brighton, Shoreline Erosion: North Shore Rail Line
07.18.2014**

The North Shore Rail Line at Bard Avenue and Richmond Terrace. In the center of the image, a fisherman can be seen fishing on what was once the old bulkhead of the North Shore Rail line with Bayonne, New Jersey in the background.

But if you will also notice that boards have been placed across the old track so that fisherman can cast a line out to the Kill Van Kull from this perch. Due to erosion, the water from the Kill Van Kill not only comes beneath the tracks but if the tide and storm surges are high, the tracks become submerged under the water.

The North Shore Rail line's easement butts up against Con Edison's property and in this photo it can be seen that the easement's erosion issues are now impacting Con Edison's property, causing the fence to tilt and the black top of the parking area to crack and develop sinkholes.



**North Shore Rail Line and Con Edison Waterfront
07.18.2014**

History of the The Con Edison Plant:

By 1882, electricity had made its way to Staten Island and by 1887 several of Staten Island's villages had electrical power.

In 1892, an electrical power plant had been built at the foot of Davis Avenue on both sides of Richmond Terrace, in what was then called New Brighton but is now called Livingston. It was called Staten Island & New York Power House.

By 1907, it became Richmond Light & Power (Rail Road) Company. In 1923, Richmond Light & Power (Rail Road)

Company was sold to the Staten Island Edison Corporation. During Staten Island Edison's operation, it seemed to suffer from heavy financial losses and it was eventually purchased in 1952 by Con Edison.

Today, the Con Edison waterfront parking lot is capped with asphalt. Possible contaminants for this site are ash, sludge, boiler slag, arsenic, mercury, chromium, cadmium and PCB's.



Kill Van Kull
07.02.2014

In terms of any kind of berm protection, there is a small amount of riprap that is on the western portion of the shore line. However, it is obviously not running the length of the property and therefore does not offer any protection from sea level rising, storm surges or flooding.



**West Brighton, Bulkhead: Caddell Dry Dock
06.27.2014**

Caddell Dry Docks has bulkheads for its property. However, these bulkheads would not be tall enough to protect the properties or residents behind this business on Richmond Terrace. During Hurricane Sandy the first floor of the Markham Garden Homes flooded.

Current Conditions

In 1979 Caddell Dry Dock built a tank cleaning plant and a steam generating facility to clean barges, tankers, and other vessels.

Possible Contaminants

Contaminants commonly found within shipyards include alkaline wastes, waste battery acid, lead sludge, waste water and

spent baths from electroplating operations, chromium, lead and cadmium-plating sludge, asbestos insulation, volatile organic compounds (VOCs), waste paint and solvents, mercury-contaminated materials, sandblasting grit containing various metal wastes, dredge sediments, and polychlorinated biphenyls (PCBs).

Inundated residential streets in West Brighton include: Richmond Terrace at Broadway, Wayne Court and a portion of Wayne Place, Richmond Terrace between Alaska and Taylor Street, Richmond Terrace midway between Dongan Street, and Bodine Street.



West Brighton, Shoreline: Heritage Park
06.27.2014

The shoreline of Heritage Park has old piers and bulkheads but no real shoreline protection from the Kill Van Kull. The waterside of Heritage Park (formerly Blissenbach Boat Marina) wetlands mitigation funded by Caddell Dry Dock.



**West Brighton/Port Richmond, Bulkhead & Pier
06.27.2014**

The Department of Environmental Protection's Port Richmond Sewer Treatment Plant, located on the waterfront of Richmond Terrace and Clove Road. This site has a bulkhead and pier.

During Sandy, this section of Richmond Terrace, as well as the sewer treatment plant, flooded due to the storm surge. Slightly west of the sewer treatment plant is Bodine Creek's outflow to the Kill Van Kull.



Port Richmond, No Resiliency Buffer
06.27.2014

Inundated residential streets during Sandy include: Richmond Terrace and lower Clove Road, Rector Street, Lower Jewett Avenue, Islin Place, and Wygant Place.

After the DEP Port Richmond Sewer Treatment Plant, there is a small stretch of natural shoreline with what looks to be old pilings but once again no protective buffer. On the Richmond Terrace side, there is a combination of commercial and residential properties.



Port Richmond, Bulkheads and Piers: Tug Boat Companies 06.27.2014

On the Port Richmond waterfront next to one another are the tug boat companies Reinauer Transportation and Moran Towing.

There is a stretch of piers along this portion of the waterfront. Moran Towing at 2015 Richmond Terrace was part of a U.S. Environmental Protection Agency investigation because it was part of the 1839 footprint for the John J. Jewett and Sons and the 1920's National Lead Industries site. The EPA did a full lead remediation of the property across the street at 2000 Richmond Terrace. The study concluded that the Moran Towing property had to cover

the areas around its fence line that were bare and that as long as the property remained blacktopped or concreted over it presented no immediate risk to the environment, workers, and the nearby residential community.¹

¹ <http://www.epa.gov/region2/superfund/removal/jewettwhitelead/JWLCIPFINAL.pdf>



Moran Towing
06.27.2014



**Port Richmond Downtown Waterfront
06.27.2014**

The Waterfront of Port Richmond, on the Richmond Terrace side, there is a combination of residential and commercial spaces, but the waterfront does not have any protective berms.

According to Church Elder Warren MacKenzie, during Sandy, the storm surge came up from the Kill Van Kull onto Richmond Terrace up Port Richmond Avenue and stopped at the first cemetery of the Reformed Church on Staten Island. The Church's white bell tower can be seen on the right.

In the 1980s, Ferry Street Enterprises, also known as

Flag Container Company, purchased the waterfront portion of the property. Flag Container Company is a private waste transfer company. The materials that they primarily handle are demolition debris, which are containerized in enclosed barges until being shipped off to the Carolinas for disposal.

Current Conditions

In 2006, Ferry Street Enterprises/ Flag Container purchased the parcel formerly known by the names The Bergen Point Ferry, Mersereau's Landing, and Decker Ferry from Standard Boat Company. This property has in its deed and titles a public access walkway leading to the waterfront



**Flag Container Company, NSWC Archival Photo
2008**

left over from its ferry use days. Ferry Service ended service in the early 1960s.

Possible Contaminants

Vehicle refinishing and repair contaminants possibly include metals and metal dust, various organic compounds solvents, paint and paint sludges, scrap metal, and waste oils. Lumber yard possible contaminants include CCA, a chemical wood preservative containing chromium, copper, and arsenic that was patented in 1838 for treatment of lumber against rotting caused by insects and microbial agents. Creosote is used mainly to preserve railroad ties. Pentachlorophenol is used

to preserve utility poles. Boat company possible contaminants include metal-containing compounds, lead as a fuel additive and ballast, paint pigments, pesticides, wood preservatives, zinc anodes, copper, tin, iron, mercury, nickel, and chrome.

With no buffers between them and the current waste transfer station, residents are exposed to various odors, diesel fumes, vermin, dust, and dirt from the waste transfer station's 24-hour, 6-days-a-week operation. Their New York State Department of Environmental Conservation permit allows them to bring in one hundred trucks per day making two trips.



Unprotected Shoreline
06.27.2014

As of 2014, the New York State Department of Environmental Conservation is scheduled to issue Ferry Street Enterprises/Flag Container a permit for a Dredge Spoils Operation on their 1.8 acre piece of property.

The Port Richmond community, the Northfield LDC, and this organization are opposed to having this kind of industrial operation in such close proximity to the Port Richmond residential community. The Dredge Spoils operation will be permitted to operate 24 hours a day, 7 days a week and is permitted to bring in up to 99 trucks per day making two trips.

Continuing past Flag Container along the waterside, the photo shows a clustering of trees at the waterfront along with some large stones that may have been placed there to act as riprap. But they would not offer real protection from rising sea levels, storm surges, and flooding of the property.

Inundated Streets during Hurricane Sandy: Ferry Street.



**Port Richmond, Riprap: Atlantic Express Bus Depot
06.27.2014**

During Hurricane Sandy this bus depot and all of North Street was submerged in the storm surge. The day after Sandy, residents began putting damaged items from their homes on the curb. In 2013, Atlantic Express filed for bankruptcy and went out of business at this location.



**Faber Park and Pool, Port Richmond
06.27.2014**

Inundated Residential Streets during Hurricane Sandy: All of North Street, a small portion of lower Treadwell Avenue, and a court of homes in that area. Richmond Terrace to lower Nicholas Avenue, Richmond Terrace and lower Newark Avenue, underneath the Bayonne Bridge.

Faber Park and Pool has a combination use of Riprap on its property. The lower part of Faber Park (above, right) was inundated during Hurricane Sandy.



Port Richmond, Shoreline Erosion and Debris: Edkins Auto 2003

Current Conditions

From 2006 to 2007 the Messacappa Bros. owned Edkins. There is still a residential home attached to this property. For the most part, it has recently operated as a salvage company. Locals have come to Edkins for years for various parts. No further information involving this business is readily available.

It was still necessary to get an idea of what others had identified in regard to common contaminants found at most salvage yards. For that information, Andrew A. Dzurik, Ph. D., P. E. of Florida State University, Florida Center for

Solid and Hazardous Waste Management, produced a report: "Environmental Impacts of Auto Salvage Facilities and their Regulation, November 2000." According to the report, the rules, standards, and target clean up levels were all based on human exposure to these contaminants.

Very few salvage yards have grown with the times and updated their operational practices to what is called Best Management Practices (BMPs). Regarding those who have updated their operation practices, they have become environmentally aware through education,



**Water View of Edkins Salvage Yard
06.27.2014**

and through partnering with various government environmental agencies to improve their operations. As a result, there will be less of a negative environmental impact from what they do. Regarding salvage businesses that have not taken on BMPs in their daily operations, there is a greater likelihood of finding contaminants in their soil, underground water sources, and possibly in the surrounding air.

The main deterrent in keeping most salvage companies from taking on BMPs seems to be the expense of testing and cleaning up their properties.

Possible Contaminants

Contaminants include petroleum products such as gasoline, diesel fuel, motor oil, transmission fluid, power steering fluid, brake fluid, engine coolants, and additives. Chlorofluorocarbons (CFCs) from air conditioning systems, metals such as iron, chromium, lead, copper, and aluminum, battery acid, brake and clutch linings, rubber, inflation cartridges from air bags, mercury switches, plastics, fabrics, and other materials.

In addition to the above, there is a possibility that the following chemicals will also be found at this type of site:



Truscanti Boat Company Property
06.27.2014

total halogens, TRPH, barium, cadmium, total chromium, xylenes, benzene, arsenic, ethylbenzene, benzo(a)pyrene, phenols, toluene, chlorometane, naphthalene, isopropybenzene, methylterbutylbenzene, polychlorinated biphenyls (PCBs) and trimethylbenzene.

Edkins Salvage Yard was inundated during Hurricane Sandy.

In the water view of Edkins Salvage Yard (previous page), there does not appear to be a berm on the property and the waterfront is littered with old pier wood that has washed up on the shore from the Kill

Van Kull. St. Mary's Church can be seen in the distance on the opposite side of Richmond Terrace.

Crossing the street end of Nicholas Avenue on the waterfront the next property is old the Truscanti Boat Company property. There is obviously no storm surge or flood protection for this section of the waterfront.



**Port Richmond and Elm Park, Shoreline Erosion
06.27.2014**

Above is a NSWC archival photo of the old Archer Daniel Midlands Company and Truscanti Boat Company site under the Bayonne Bridge.

possible contaminants include paint, paint solvents, lead, copper, zinc, mercury, wood treatment, nickel, cadmium, arsenic, and oils.

Current Conditions

Currently there aren't any permanent structures on this site. It is used mostly for storage of vehicles. Local residents said there was an interest at one time in building a warehouse on this parcel. But after preliminary testing of the soil revealed contamination, the deal was called off.

According to New York State Department of Environmental Conservation, they are making inquiries into who exactly filled in the tidal wetlands on the old Truscanti Boat Company property without a permit.

Possible Contaminants

Since this was a boat-building business at one time, the



**Archer Daniels Midland Company
06.27.2014**

During Sandy, the old Truscanti Boat Company property was completely submerged with the storm surge, as was Richmond Terrace.

East of the Bayonne Bridge, this clump of small trees to the right in the photograph is all that is left of the (1939 to 1942) Archer Daniels Midland Company piers. You can see a little bit of the stone portion of the piers if you look closely at the shoreline in the photo above. The shoreline has been eroding for a number of years.

Archer Daniel Midlands / Manhattan Project



Aerial Photo of the Bayonne Bridge Port Authority Property 2007

History

Dean Linseed Oil Works was located at 2393 Richmond Terrace, Port Richmond from 1898 to 1916. Based on a 1909 Staten Island Borough Hall topographical map, this site location had six structures, 16 storage tanks on the waterfront side of their property, and five storage tanks upland on the Richmond Terrace and John Street side, approximately where the Federal Express property is now.

By 1917, American Linseed Company owned the three parcels, and a portion of the old Truscanti Boat Company on the eastern side of Parcel 1.

On August 29, 1928, American Linseed Company divided the waterfront property. They sold a portion of the land, including that which was under water, to The Port Authority of New York. The Port Authority of New York and New Jersey still owns this property. The other portion east of where the Bayonne Bridge stands was sold to Archer Daniel Midlands Company, along with parcel 2 Nicholas Avenue (9½ acres) and Parcel 3 John Street. Archer Daniel Midlands Company's corporate offices at the time were in Minneapolis, Minnesota.

The Manhattan Project involving ADM Parcels 1, 2, and 3 have

become a Staten Island urban legend. The 1939 plans came from President Franklin D. Roosevelt and the Atomic Energy Commission and were sent only to New York City Mayor Fiorello LaGuardia. Staten Island's Borough President and other officials were never included in the discussions. Therefore, there aren't any records on Staten Island in reference to its role in the Manhattan Project. To this day there is only one reference to Archer Daniel Midlands Company ever having a Staten Island location and that is in the County Clerk's office in the deed books. It is as if their presence here has been almost completely erased from history.

According to the U.S. Department of Energy's report, from 1939 to 1942 the Archer Daniel Midlands Company was operating as a linseed oil manufacturing company at the 2393 Richmond Terrace location. It was during this time that ADM agreed to store in their warehouse on the waterfront property, 1,200 tons of 65% U3O8 high grade uranium ore mined in the Belgian Congo, in 2,007 steel drums.

While in transit, either during delivery to this location or when it was being sent to Canada and Ohio by train to be refined for use in the atomic bomb,

uranium was spilled on the waterfront property.

Private ownership has caused a stalemate in getting these sites remediated. The uranium was privately owned by Union Miniere du Haut Katanga, being imported and eventually sold by their American affiliate African Metals Corporation, and stored on privately owned ADM property.

This property has not been remediated since the U.S. Government neither purchased nor took possession of the uranium until after it left this privately owned property. As such, this site was not grandfathered under the 1944 agreement to clean up Manhattan Project sites.

On December 27, 1945, ADM sold all three parcels of land to Roger Hudson Williams and Arthur Richard Earnshaw for \$100.00. At some point, all of the structures on the ADM parcel 1/ 2393 Richmond Terrace were demolished but there aren't any records to indicate what happened to the debris. Also at some point a portion of the underwater property beneath the Bayonne Bridge was filled, and so was a portion of the old Truscanti Boat Company property, going towards Nicholas Avenue along the waterfront.

In the 1980s, the Health and Safety Research Division of Oak Ridge National Laboratory, Oak Ridge, Tennessee tested the waterfront property and it proved positive for radiation. In their report they identified the site as being at the base of the Bayonne Bridge on Richmond Terrace. The Oak Ridge Research Team could never get permission to test ADM's Parcel 2/Nicholas Avenue 9½ acres and ADM's Parcel 3/John Street.

By 1999, the Nicholas Avenue ADM Parcel 2 had been purchased by developers with the intent of putting 120 to 280 units of housing on it, after its zoning had been changed from manufacturing to residential. At the same time, the Army Corps of Engineers had also announced that they planned to dredge and blast 45 feet to deepen the Kill Van Kull.

While doing an independent investigation on the history of the site and its uses, residents were interviewed. The residents identified the ADM property as having something bad there but were unable to explain what it was. Other residents said that a group from the Japanese Embassy had been at the location in the 1980s saying prayers. With two projects scheduled to take place in proximity of this location, it became clear that

more historical information was needed regarding this property. Everything pointed to the possibility that the ADM sites may have been part of the Manhattan Project. The United States Air Force was contacted first. They suggested speaking with old Atomic Energy Commission, which had become the U.S. Department of Energy. A written request for any information regarding the ADM sites was made through the Freedom of Information Act.

On August 28, 2001, responding to a Freedom of Information Act request, the U.S. Department of Energy faxed its Oak Ridge Report on the history of the 3 ADM properties. In speaking with one of the scientists at the Department of the Energy, he said that there were still a number of hot spots in New York. When he was asked if the government knew about them, he responded that everyone knows about them.

Current Conditions

Archer Daniel Midlands Company's Corporate Offices are in Decatur, IL. African Metals Corporation's corporate offices are in British Columbia, Canada. Fortunately, since both of these companies are still in operation, further historical information regarding these properties may be available if proper inquiries are made.

Possible Contaminants

Possible contaminants from the linseed production include oil, and machine oils. NSWCC submitted the Department of Energy's Oak Ridge Report and our letters of opposition into the Uniform Land Use Review Procedure (ULURP). It was necessary for the ADM Parcel 2 to go through the ULURP process because the developer was requesting a zoning change from manufacturing to residential. The zoning change proposal would have to be reviewed and voted on by the NYC City Planning Commission and City Council. It was during the public comment process of the ULURP for ADM Parcel 2/ Nicholas Avenue (9½ acres) that it was pointed out that in the developer's Environmental Impact Assessment they had omitted this portion of these properties' histories.

Although NSWCC had received the Department of Energy's Oak Ridge Report, we still had no way of knowing how the 2,007 steel drums filled with raw uranium were delivered to the train. Therefore ADM Parcel 2 also had become suspect for possible contamination because the North Shore rail line ran adjacent to the property. There were simply too many unanswered questions regarding these sites for every precaution not to be taken.

The Nicholas Avenue 9.5 acres, after its zoning change from manufacturing to residential, over a period of time underwent a series of soil tests and it was determined that this site was not radioactive. However, remediations for non-radioactive contaminants had to be completed. Then, in 2014 the developer of the Nicholas Avenue 9.5 acres (now being called the Nicholas Avenue Estates) began building homes on the property. With community objections in tow, the freshwater wetlands on the property were allowed to be filled.

The radioactive ADM/Manhattan Project Storage site is diagonal from these homes and is in a flood prone area. As of 2011, the ADM/Manhattan Project Storage site was under consideration for the U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program (FUSRAP).¹ As of 2014, the remediation of the ADM/Manhattan Project Storage Site is pending.

The ADM property was under water during Hurricane Sandy. Eyewitness accounts from nearby residents state that the tops of the clump of trees on the property were underwater from the storm surge.

¹ FUSRAP Stakeholder Report 2013
http://energy.gov/sites/prod/files/2013/05/f0/FUSRAP%20Stakeholder%20Report_1.pdf



**Mariners Harbor, Shoreline Erosion
06.27.2014**

West of the Bayonne Bridge along Richmond Terrace, the waterfront shows signs of erosion and debris with what may have also been a small riprap and or bulkhead at one time.



**Mariners Harbor, No Bulkhead and some Riprap
06.27.2014**

Staten Island Terminal, LLC/
Cementos Lima Peru, at the
corner of Richmond Terrace and
Morningstar Road.

Terrace prevents residents from
seeing the property. This section
of Richmond Terrace was also
flooded during Sandy.

This company's plan was to
bring in wet cement from Lima,
Peru by barge and build an
18-story silo next to the Bayonne
Bridge. They then planned to
truck this cement throughout the
New York City area.

The community was opposed
to this waterfront property
being used in this way. The
property has what seems to
be large stones for riprap on
the waterfront side. However,
the large stone wall in the front
of the property on Richmond



**Mariners Harbor, Shoreline Erosion
06.27.2014**

This stretch of waterfront along the Kill Van Kull in Mariners Harbor shows some rocks but mostly floating wood debris. There is nothing here that would offer resiliency protection for the commercial and residential properties that are on Richmond Terrace. The red brick structures are foundry ovens.

Inundated during Hurricane Sandy: Richmond Terrace starting at Winant to Mariners Lane, lower Granite Avenue, Emeric Court, lower Houseman Avenue, lower Wright Avenue, lower Lake Avenue, and lower Simonson Avenue.



Mariners Harbor, Natural Shoreline Protection
06.27.2014

From the land side of Richmond Terrace, Van Name, Van Pelt Park's wetlands, mud flat, Spartina grass, and cove. Great Lakes Dredging Company in the background.



**Mariners Harbor, Bulkhead and Piers
06.27.2014**

Great Lakes Dredging has a bulkhead.



**Mariners Harbor, Bulkhead and Piers of Old Bethlehem
Steel Shipbuilding Company**

Inundated during Hurricane Sandy: Richmond Terrace after Van Pelt to South Avenue, lower De Hart Avenue, lower Union Avenue, lower Coonley Court,

lower Bush Avenue, lower Harbor Road, lower Lockman Avenue, lower Andros Avenue, lower Mersereau Avenue, and lower Post Lane.



**Mariners Harbor, Shoreline Erosion with some Riprap
06.27.2014**



**Mariners Harbor, Bulkhead and Piers at May Ship Repair
06.27.2014**



Mariners Harbor, Bulkhead
06.27.2014

Arlington Terrace Apartments
and residential homes in the
background.



Mariners Harbor, Bulkhead and Piers
06.27.2014

Old wreckage at the waterfront
of Arlington near the Mariners
Harbor Yacht Club.



Arlington, Port Ivory Tidal Wetlands
06.27.2014



Mariners Harbor Yacht Club Bulkhead and Piers
06.27.2014



Old Port Ivory
06.27.2014

Old Port Ivory property slightly west of the Mariners Harbor Yacht Club. The yacht club has piers, but the old Port Ivory property has gone back to being tidal wetlands.



Arlington Marsh 80 Acres Tidal Wetlands and Cove A Natural Resiliency Buffer

Making the bend to Arlington Marsh, this stretch of Arlington Marsh has a sand beach that is often times covered with debris and garbage that has floated on it. The tidal wetlands and cove of Arlington Marsh and the freshwater wetlands of Mariners Marsh acted as natural buffers and sponges when Hurricane Sandy's storm surge hit the island. The residents living near these wetlands were protected from the storm surge and flooding.



Arlington Marsh and its Cove Tidal Wetlands **06.27.2014**

The conclusion is that the North Shore of Staten Island in its industrial 5.2 miles does not have a congruent line of protection from sea level rising, storm surges, and flooding.

Even if the businesses that do have bulkheads and/or piers have what is identified as a berm, they may be sitting next to a waterfront property with no berms and no natural protective barriers. Therefore, when the surge hits the existing bulkhead it will push out to the sides and enter the waterfront property from the unprotected shore line on either side of it and make its way back to the residential community.

The existing bulkheads were never designed as protective buffers from Nor'Easters, hurricane, or climate change impacts such as sea level rising and storms that bring high-wind storm surges that can easily top the bulkheads.

In addition, hard shoreline areas next to unprotected areas may also be increasing the rapid erosion of the unprotected areas of the waterfront. This shoreline erosion is very problematic especially for properties that may have contamination issues that they have tried to cap in some way. A more permanent solution is needed.



Flood waters containing chemicals, debris, and/or contaminated soil that becomes dislodged during a storm surge will make its way back into the residential community. This kind of exposure to those living near the industrial properties is something that needs to be considered with resiliency planning and implementation.

The planning and implementation must happen sooner rather than later, as Nor'Easters are frequent and it is predicted that Category 1 storms like Sandy will become the norm for New York City. North Shore residents must be educated about how close

they live to the Narrows, Kill Van Kull, and Lower Newark Bay to promote responsiveness to warnings regarding Nor'Easters and hurricanes. Residents living on or within 50 feet of Richmond Terrace, North Street, lower Jewett Avenue, Bank Street, Bay Street, Bay Street Landings, and Front Street are all in areas that were inundated with flood waters during Sandy and, in some cases, with Nor'Easters.

There are more than 70,000 people on the North Shore, a vulnerable population made even more vulnerable due to their proximity to the Kill Van Kull tidal strait and lack of education about their island environment.

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