



**SHORE UP**

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**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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### **Special thanks to**

Debbie Mans and Captain Steve Delaney, New York/New Jersey Baykeeper  
Karen Alexander Taylor and Joy Grant, mapping expedition volunteers  
Liz Barry, Bronwen Densmore, and Charles Stewart, Public Lab Kite Flyers  
Firemen of FDNY Marine 9 of Stapleton, Staten Island, NY  
Dr. Melissa Checker, Queens College, City University of New York  
Troy Simpson, the Graduate Center, City University of New York  
Warren MacKenzie and the Reformed Church, Staten Island  
Diana Ramos, Debbie Grant, Gabri Christa, NSWC Board and members  
Joe Wright, Donna DiMeo, Eileen Kaufmann, and Sandy Amerio





## 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 damage 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.

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

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.



**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

/bərm/

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.<sup>1</sup>

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.

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



A Berm



A Jetty

(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>

(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 shore line 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<sup>1,2,3</sup>. However, the EPA also stated the following regarding FFC in terms of beneficial uses:

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

<sup>2</sup> 40 CFR 401.15, 40 CFR 302.4, & Table 302.4.

<sup>3</sup> <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.



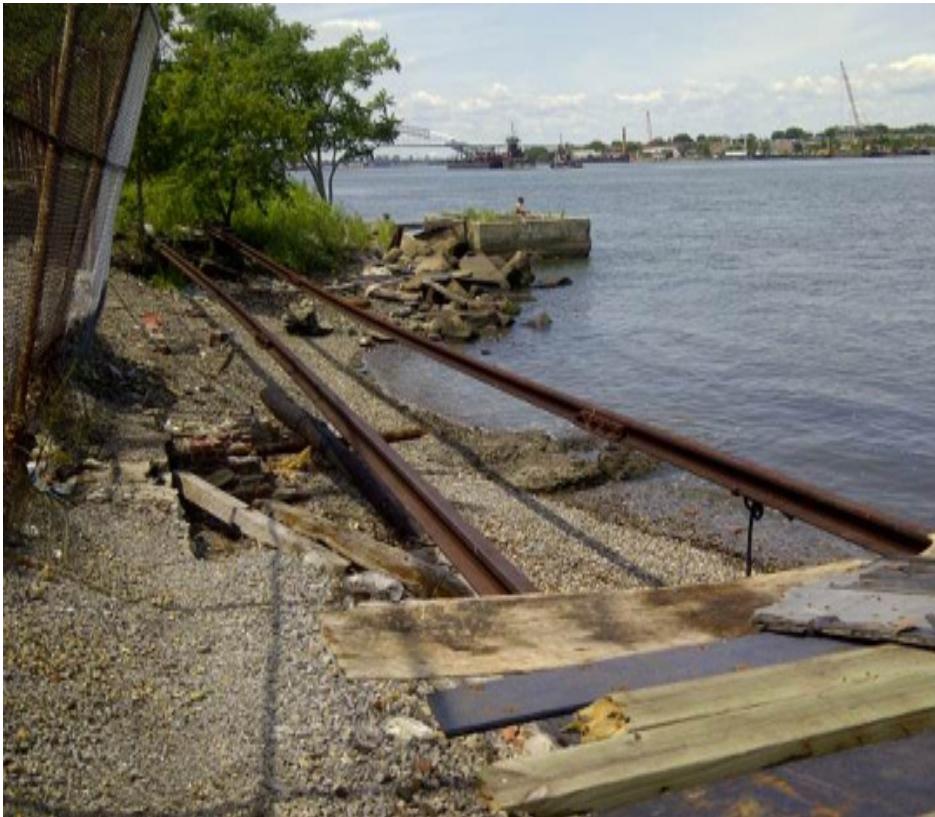
**Livingston, Shoreline Riprap: Blue Restaurant Waterfront**  
**06.27.2014**

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.

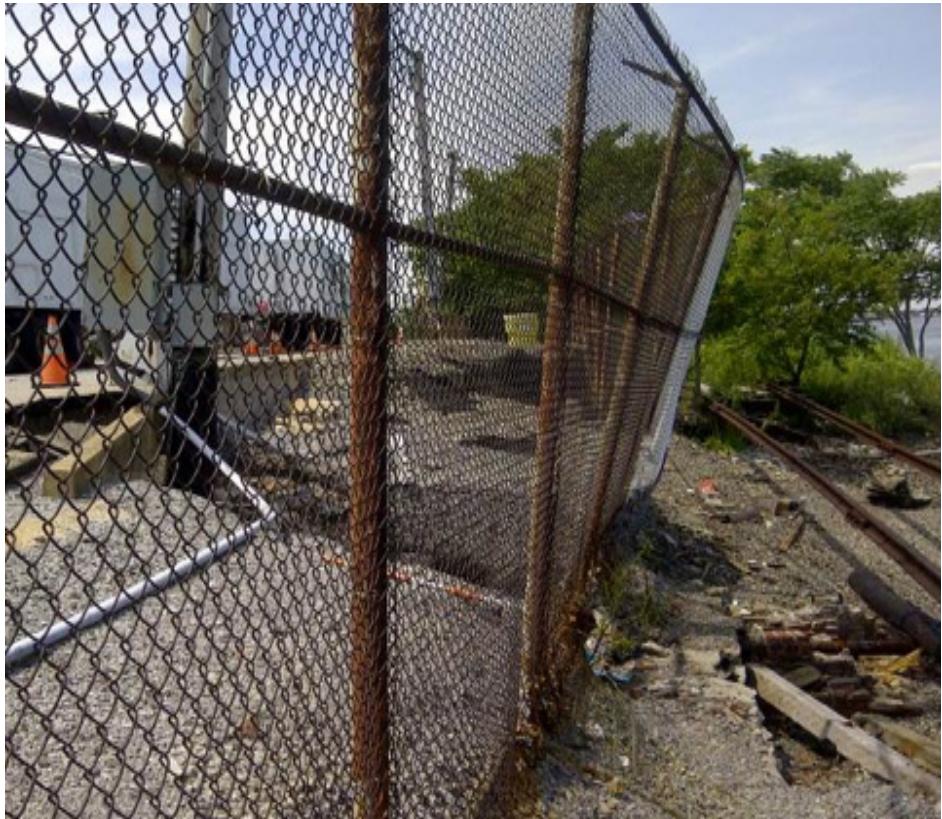


**West Brighton, Shoreline Erosion: North Shore Rail Line**  
**07.18.2014**

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 Kull 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, Islip 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.<sup>1</sup>

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<sup>1</sup> <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, cooper, 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. Pentochlorophenol 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, cooper, 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, isopropylbenzene, methyltertbutylbenzene, 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.

***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.

***Possible Contaminants***

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

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

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.



**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 Truscani 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. NSWC 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 NSWC 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).<sup>1</sup> 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.

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<sup>1</sup> FUSRAP Stakeholder Report 2013  
[http://energy.gov/sites/prod/files/2013/05/f0/FUSRAP%20Stakeholder%20Report\\_1.pdf](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.

## References:

Staten Island's Gold Coast: 5.2 miles from St. George to Arlington, Department of City Planning, City of New York's North Shore Brownfield Opportunity Area: Hurricane Sandy Inundation Analysis Map, Hagstrom 5 Borough Pocket Atlas, Public Lab Maps, Eymund Diegel, Liz Barry, Bronwen Densmore. U.S. Department of Energy's Formerly Utilized Sites Remedial Action Program, Staten Island Advance. Environmental Impacts of Auto Salvage Facilities and Their Regulations by Andrew A. Dzurik, Ph.D., P.E. of Florida State University, Florida Center for Solid and Hazardous Waste Management. Staten Island Borough Hall Topo Map Department, New York State Department of Environmental Conservation, U.S. Environmental Protection Agency. Lena Delvaron, Warren MacKenzie, Reformed Church on Staten Island, Alfred Gill, Neighborhood Housing Service of Staten Island, Professor Melissa Checker, CUNY. U.S. Department of Energy and Oakridge Tennessee Laboratory, Trust for Public Land, Guide to Contaminants Found at Contaminated Industrial Properties, New York Container Terminal, U.S. Army Corp of Engineers, New York, New Jersey Port Authority, U.S. Coast Guard. Wikipedia, Atlantic Salt Company, Captain Richard J. Schoenlank, United N.J. Sandy Hook Pilots Association, Fire Department City of New York Marine 9, New York City Economic Development Corporation. Debbie Mans, New York/New Jersey Baykeeper and Captain Steve Delaney. Caddell Dry Dock. Forgotten New York's Richmond Terrace Staten Island Part 2, Google Earth Map, Mapipedia. NOAA- National Oceanic and Atmospheric Administration. New York City Department of Environmental Protection.

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Special thanks to the following sponsors and community partners whose continued support has made possible  
NSWC's "Shore Up: Community Resilience and Adaptation" Project and Environmental Justice work:



New York State Department of Environmental Conservation's Office of Environmental Justice's Environmental Justice Community Impact Grant



Con Edison's Strategic Partnership – The Power of Giving



Richmond County Savings Foundation



FJC, our Foundation of Philanthropic Funds



Debbie Mans and the Staff at New York, New Jersey Baykeeper



Dr. Melissa Checker and Troy Simpson



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