National Park Service
U.S. Department of the Interior

Gateway National Recreation Area
210 New York Avenue
Staten Island, NY 10305

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Great Kills Park Information on Radium Contamination

This fact sheet includes information on the discovery, investigation, and removal of radioactive materials, in the form of radium, found in the ground in areas of Great Kills Park. The purpose is to provide information on what was found, the potential health effects associated with this material, what the National Park Service (NPS) continues to do to ensure that the Park remains a safe place for NPS staff and Park visitors, and that the environment is protected. NPS will provide additional information and updates as they become available.

What was Found?
Radiological contamination was first discovered at Great Kills Park (GKP) in 2005 during an aerial survey conducted by New York City and the U.S. Department of Energy to develop a baseline radiological map of the city. From 2005-2007, additional areas of radiological contamination, comprising radium-226, were found within GKP. In 2009, several small sources of radium buried more than a foot below the ground surface were removed. Additional areas exhibiting above background radiation readings have been identified within the area of Great Kills Park that was filled with sanitary waste in the late 1940's.

What is Radium?
Radium is a naturally occurring element that is radioactive. It is constantly formed by the decay of two elements, uranium and thorium, which exist naturally in rock and soil. The amount of a radioactive element present is reduced naturally by the decay process, measured as the length of time it takes for half of the quantity to decay, also known as a "half-life". Radium's half-life is quite long (on the order of 1,600 years). During the radium decay process, radiation is released as x- and gamma rays, as well as alpha and beta particles.

Naturally-occurring radium is found in relatively low levels in soil and rock throughout the environment. Small quantities of naturally-occurring radium are also present in building materials such as granite, cement, and clay brick. Radium can be taken up by plants and can also be found in groundwater. The human body contains traces of radium associated with naturally-occurring uranium which may be present in the foods we eat.

In the United States, we are exposed to many sources of radiation every day. On average, we each receive a radiation dose of approximately 1 millirem per day (a unit of measure for radiation dose) from naturally-occurring radioactive elements in our bodies and the environment, from cosmic (sun) rays, as well as from man-made exposures, primarily from medical diagnosis (like x-rays) and treatment. Exposure from cosmic rays increase with altitude above sea level. Thus a person in the Rocky Mountains receives more radiation exposure than a person at sea level. On average, radiation from natural sources is responsible for about eighty percent of the radiation U.S. residents receive annually.

Can Radium be Harmful?
Exposure to radiation can cause cancer. Radium has been responsible for causing cancer in workers who painted watch dial faces. They wetted their paint brush tips by mouth to make a fine point to apply the paint; by doing so, they ingested radium. Additionally, a potentially harmful decay product from radium

is radon gas, which is suspected to cause lung cancer in uranium miners, and can become concentrated in homes in certain areas of the country. While these conditions do not exist at the Park, improper handling and disposal of radium sources can be harmful to the public. This is why the Park Service has closed portions of Great Kills Park until the matter is thoroughly investigated and any appropriate cleanup is implemented.

How Did Radium End up at Great Kills?
Investigation into the source of the radium contamination is ongoing. Based on the information we have at this time, it is believed that the radium came from discarded materials brought to the site. Radium present in these items has caused contamination of the soil surrounding the sources.

Am I at Risk from Exposure to Radium at Great Kills?
In the closed areas exposure, and ultimately risk, depends on the amount of time and how close you are to the actual source of the radiation. The greatest risk at the site is from direct contact with the radium contaminated soil. The National Park Service has installed fencing to restrict access to the contamination to prevent such contact and signage to inform visitors of the closed areas. The established boundaries put visitor safety first, our highest priority. In order to protect your health and safety NPS has closed the affected sections of Great Kills Park to pedestrians and vehicles.

What is Being Done?
The National Park Service is following the process detailed in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to address the contamination at this site. Technical support is being provided through the US Army Corp of Engineers and contractors.

NPS contractors are currently working to identify and mitigate short term risks associated with the radiological contamination. By the summer 2014, the NPS will have installed more than 18,000 feet of perimeter fence, cut back vegetation and performed a gamma survey over 265 acres, excavated areas with the highest levels of radioactivity, and will continue restrict public access to levels of radioactivity that may pose a potential health risk.

Through the course of implementing these response actions, NPS has learned that the radiological contamination is more widespread within the fill material than previously thought and is not limited to buried discrete hot spots. Given this finding, NPS has determined it is appropriate to initiate a comprehensive investigation to fully characterize the nature and extent of radiological contamination and evaluate alternatives for a permanent remedy. For more information and updates on this project please go to:www.nps.gov/gate/parkmgmt/greatkillscleanup.htm or email greatkillscleanup@nps.gov

Where Can I Obtain More Information about Radium and Radiation?
Information about radiation and radium in general can be found from the following sources:

- Agency for Toxic Substances and Disease Registry (ATSDR)- http://www.atsdr.cdc.gov/tfacts144.html
- The National Institutes of Health http://www.nih.gov/health/chip/od/radiation/
- Argonne National Laboratory http://www.ead.anl.gov/pub/doc/NaturalDecaySeries.pdf,
- Health Physics Society http://hps.org/publicinformation/asktheexperts.cfm

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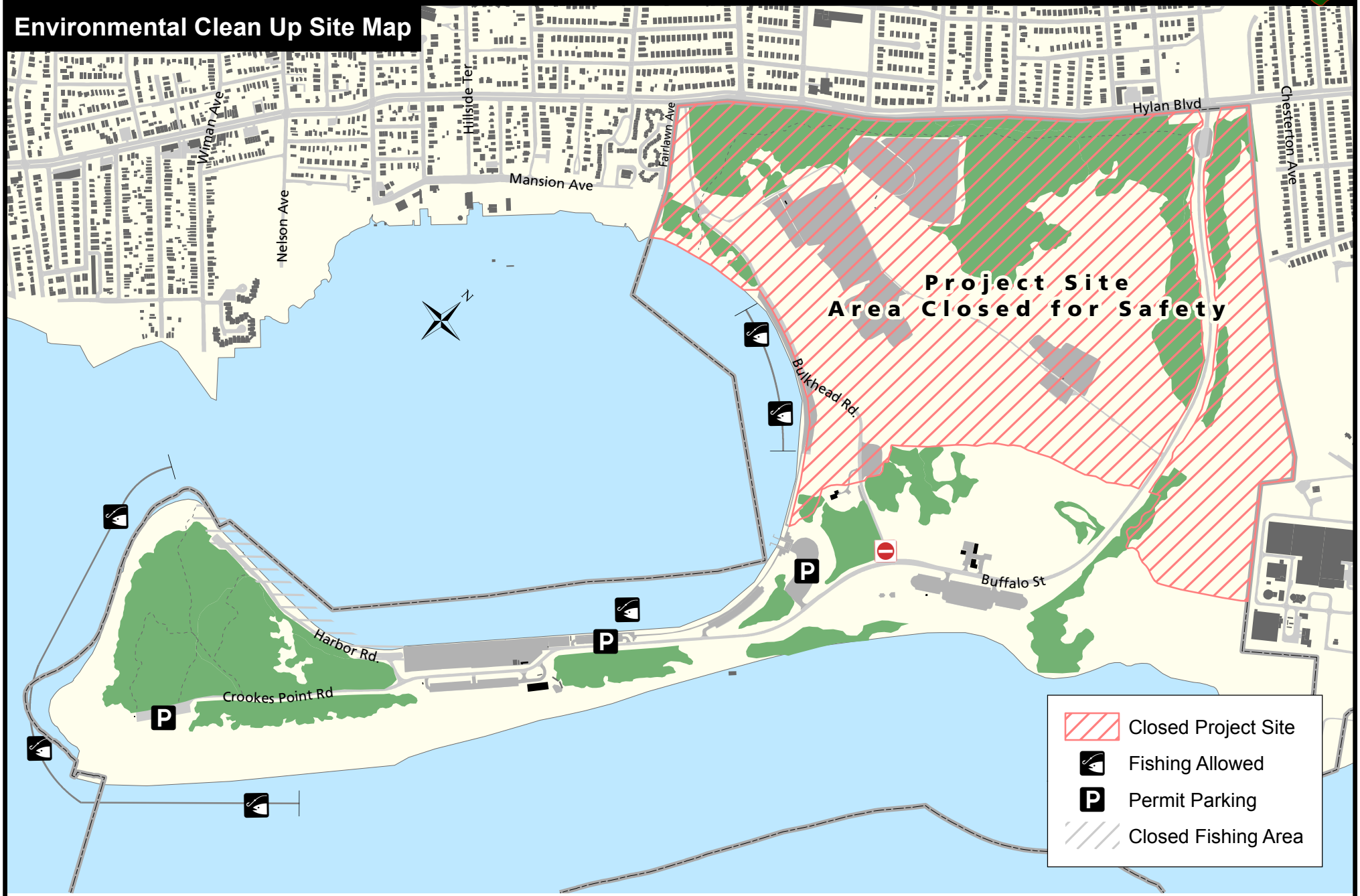
Environmental Clean Up Site Map



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