# fresh perspectives

FreshkillsPark Newsletter — Winter 2008

## North Park to initiate transformation of Fresh Kills

Construction will begin on the first phase of North Park's 240-acre development in 2009. A 20-acre swath of land will be the first area developed within the boundary of the former Fresh Kills Landfill. It will provide space for active and passive recreation, allow visitors to experience the spectacular views of William T. Davis Wildlife Refuge, and let the public see firsthand the ongoing process of transformation at Freshkills Park. This first phase will include a broad multi-use pathway and secondary paths, a tree nursery and seven-acre Founder Seed Farm, a forested plateau, a composting comfort station, a picnic lawn, a waterfront overlook deck and a bird observation tower. Development at North Park will set precedent for a focus on sustainability that will extend to all future development of Freshkills Park.

### ACCESS

There will be two entrances to North Park. The soon-to-be-renovated Schmul Park will be a gateway for the Travis neighborhood; a new 75-space parking lot off Wild Avenue will provide regional access. The lot will be planted with trees to provide shade for cars and to blend the area seamlessly into the landscape. Solar panels mounted atop a shade structure at the entryway to the park will provide power for the lights in the parking lot.

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**Above**: A rendering view from atop the Bird Observation Tower in North Park, looking southwest over the Arc Path and the Founder Seed Farm.

# North Park features focus on recreation, sustainability

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## MULTI-USE PATH

The multi-use path will form the spine of the park. Both entrances, from Schmul Park or the parking area, will be connected to the rest of the park by the multi-use path. This divided walking and high-speed path will extend all the way to North Park's eastern edge at Main Creek. Walkers, runners, cyclists and families with strollers will be able to reach all the park features from this path. The path will be lined down its median by a flowering swale, a planted drainage feature that is both beautiful and practical. The middle stretch of the path run beside the gentle slope of North Mound and incline slightly toward the path's center, a forested plateau.

## TREE NURSERY

Approaching the plateau, visitors will come across an innovative pot-in-pot tree nursery. Here, a grid of set-in planting pots, or "sockets," will provide an effective way to nurture tree saplings that can ultimately be used to populate other sites in the park. The pot-in-pot design allows saplings to be transplanted easily by eliminating the need to excavate their roots. The tree nursery will allow visitors to witness the active process of transformation at Freshkills Park. Also located in this area and along the length of the Main Path will be distinctive wood-and-steel benches.

## PLATEAU & COMFORT STATION

Continuing along the Arc Path, visitors will reach the Plateau, where the park will open into a forested grove. A comfort station on the Plateau will use solar technology to power its lighting and exhaust systems. The comfort station will also feature composting toilets—an increasingly popular technology also in use at the Bronx Zoo, Queens Botanical Garden, and New York State Parks—to minimize the site's waste stream and eliminate need for a sewer line.

## FOUNDER SEED FARM &

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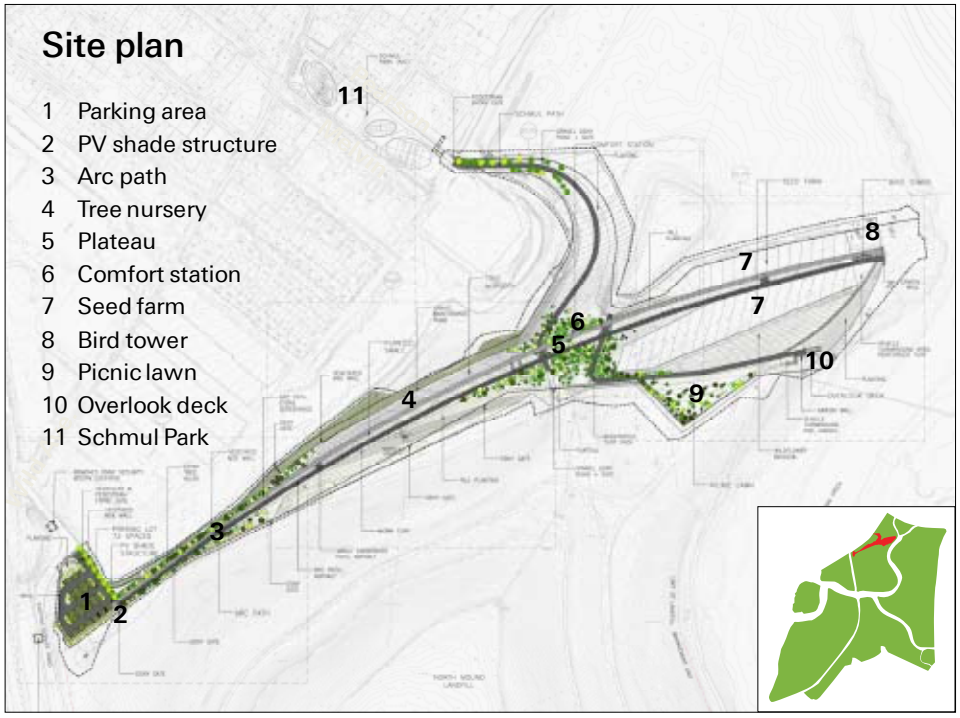


The North Park Phase One site plan, and a map of Fresh Kills indicating the location of the project.

## Freshkills Park Team

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## Mission

As Freshkills Park moves from the planning stages to implementation, we strive to keep community members informed of the progress in bringing this innovative project to reality. Building this park requires many coordinated activities including the planning and design of the park, engineering for roads and other technical aspects of the park design, and environmental assessment and regulatory permitting. The purpose of the Fresh Perspectives newsletter is to provide updates about the project's progress as well as information about its history and some of the unique features, resources and complexities of the site.

**Top:** A photovoltaic (PV) array mounted atop a shade structure at the planted entryway to the parking bosque. The PV array will provide power for the lights in the parking lot.

**Above:** A Bird Observation Tower at the end of the multi-use path, situated at water's edge.

**Left:** A forested grove will sit at the plateau where the two paths meet. A comfort station will also be located in this area and feature composting toilets and PV panels to power its lighting and exhaust systems.

# Landfill systems keep Fresh Kills safe, environmentally clean

## The site has advanced soil barriers and byproduct collection systems

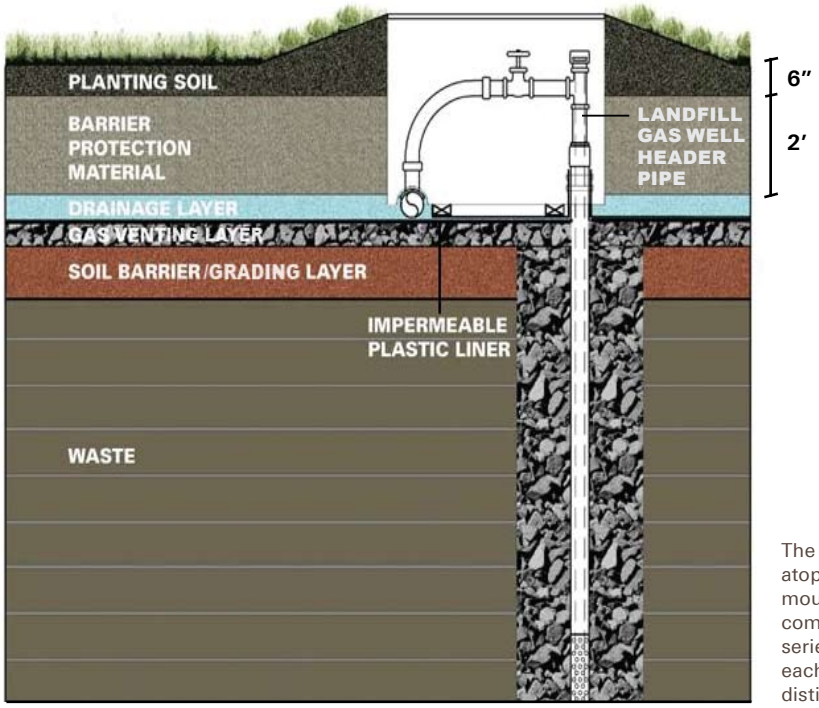
Although Fresh Kills is no longer accepting refuse, it will take an anticipated minimum of 30 years before garbage decomposition is complete, associated gas production and settlement cease, and leachate fully drains from the site. As these processes continue, there is an ongoing need for regular maintenance, monitoring and evaluation of the site and systems that have been put into place. Access to these systems are essential to inspection, maintenance and repair.

Two of the four mounds at Fresh Kills, North and South Mounds, are already capped with a thick, impermeable cover that separates the waste from the environment and the public. The remaining two mounds, East and West Mounds, are in the process of being capped. The City's Department of Sanitation (DSNY) is currently working with the State Department of Environmental Conservation (DEC) to ensure environmentally sound closure of the landfill sections that remain uncapped and to prepare for DSNY's long-term operational responsibility (a minimum of 30 years post-closure) for on-site environmental monitoring and control systems. No area will be open to ongoing public access until it has been tested and found safe for park use.

What follows are brief descriptions of some of the landfill infrastructure systems that are in place at Fresh Kills:

### LANDFILL CAP

The essential design goals of the final cover placed over the solid waste are hydraulic performance, slope stability and long-term integrity or durability of the landfill and its systems. These are achieved by minimizing surface water infiltration, preventing erosion, promoting proper surface water drainage, and separating the waste layer from the environment to protect public health.




The final cover atop the landfill mounds is composed of a series of layers, each with a distinct function.

The final cover is made of a series of layers, each with a distinct function:

• The soil barrier/grading layer is laid over the solid waste and is graded and compacted to appropriate slopes. DEC sets minimum and maximum required grades (4% to 33%) to maintain stability and promote proper drainage.

• A gas venting layer is constructed of a geocomposite to facilitate the movement of landfill gas towards the landfill gas vents or extraction wells.

• An impermeable plastic liner prevents water from entering the waste by stopping its flow and promoting storage or drainage of water in the above layers. This layer also prevents the upward migration of gas into the atmosphere except in controlled places. This is a crucial component of final cover.

• A drainage layer is needed in some portions of the final cover. This layer reduces the pressure of water on the impermeable liner and increases friction, thus reducing the risk of sliding. It drains the overlying protection layer and reduces risk of over-saturating cover soils above.

• A barrier protection layer stores excess water until it is either used by overlying plants or drained off. This layer is composed of soil and has a minimum thickness of 24 inches.

• The final layer is the planting soil layer or top soil layer, which has a minimum thickness of six inches. The soil used is a sandy loam, selected for its potential to prevent soil erosion and to provide a good growing medium for vegetation. A network of plant roots hold onto the soil, providing stability.

### LANDFILL GAS COLLECTION

Landfill gas (LFG) is the gas generated by the anaerobic

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decomposition of organic materials at solid waste disposal sites. Generally landfill gas is 50-55 percent methane and 40-45 percent carbon dioxide, with the remainder being residual gases. At Fresh Kills there is a landfill gas collection system that minimizes the impacts of landfill gas emissions in addition to converting the landfill gas into a source of renewable energy. Instead of being released into the atmosphere, a network of landfill gas wells, piping and transmission lines brings the gas to a central location on the Fresh Kills site where it is purified and converted to high BTUs (British Thermal Unit, the term used to describe the heat value of fuels).

On a typical day at Fresh Kills, 10 million cubic feet of landfill gas is collected, about half of which can be converted to energy used for household cooking and heating. The high BTUs are sold to National Grid, a distributor of natural gas and generator of electricity, and can heat the equivalent of up to 22,000 homes per day.

To ensure the safety of the site, there are numerous aboveground landfill gas monitoring devices on the mounds at Fresh Kills. Measuring at about three feet high, these devices can be read remotely to make sure that the levels of emissions are safe for the landfill and surrounding community. A back-up flare system is also in place and is equipped to handle all operations of managing landfill gas when portions of the landfill gas infrastructure system need to be repaired.

As the landfill ages, the anaerobic decomposition of the refuse will slow and eventually cease, and there will be no more landfill gas to collect. DSNY is committed to monitoring and collecting the landfill gas until it is no longer environmentally or economically feasible to do so. In this event, a passive emission release sytem will be activated to avoid build-up of gases.

## LEACHATE COLLECTION

Leachate is another byproduct of the decomposing waste in the landfill. Leachate is the liquid produced when rainwater percolates through solid waste. Soluble materials in the refuse are collected or dissolved into the passing water and may contain chemicals that would be harmful to the surrounding environment and groundwater. It is similar to the "goo" sometimes found in the bottom of your trash bin.

A series of leachate cutoff walls around the base of each mound function as a barrier to restrict the exchange of water between the landfill and the surrounding aquifers. The cutoff walls are constructed of a clay material

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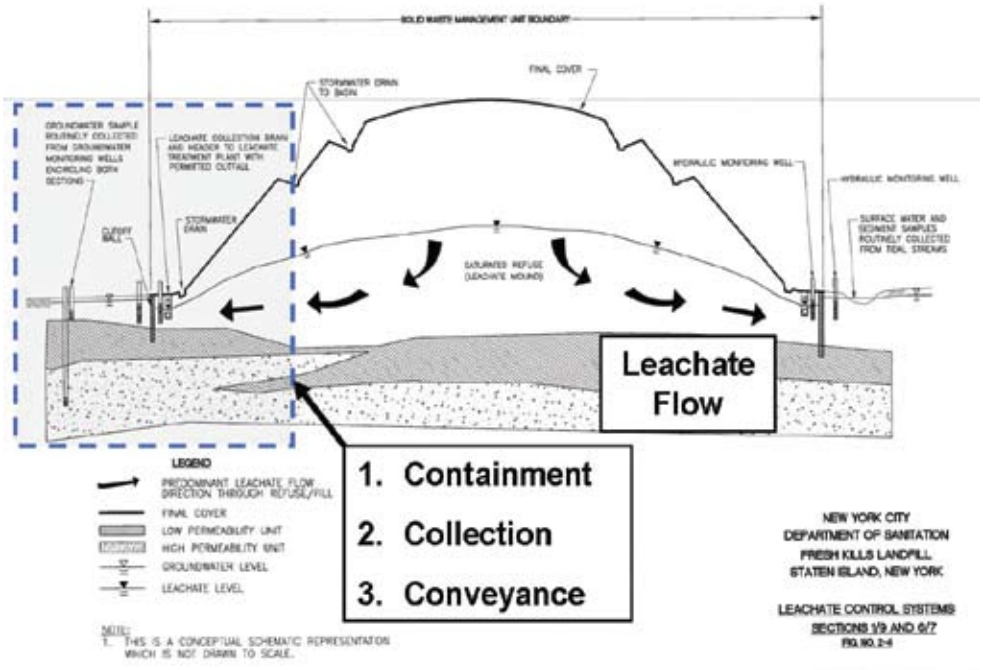
## Anaerobic decomposition

The decomposition of organic materials without exposure to oxygen is called anaerobic decomposition. It is a natural process, occurring both in landfills and in wetland marshes. It is also the primary chemical reaction in beer production.

The main gaseous products of anaerobic decomposition at Fresh Kills are Methane ($CH_4$), Carbon Dioxide ($CO_2$), and a combination of Hydrogen, Nitrogen, and Oxygen ($H_2$, $N_2$, $O_2$). These gases are colorless and odorless. Their capture is not only economically viable but also environmentally responsible: carbon dioxide, the chief cause of global climate change, is dwarfed by the effects of methane, which has about 25 times the global warming potential (GWP) of carbon dioxide as determined by its absorption of infrared radiation, spectral location of absorbing wavelengths and atmospheric lifetime. Landfill infrastructure at Fresh Kills captures approximately 38,000 tons of methane per year, equivalent to 735,000 tons of carbon dioxide emissions.




A diagram of the leachate collection systems in place at Fresh Kills, which collect up to 600,000 gallons of leachate daily.

# North Park Arc, continued

**Top:** A view of the Bird Observation Tower from the Overlook Deck.

**Above:** The multi-use path, with separate walking and high-speed lanes.

## Founder Seed

Seed collected from local, wild populations to form the basis of further seed production. Its cultivation is the first step in producing genetically appropriate supplies of seed for large-scale land restoration projects.

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## PICNIC LAWN

At its eastern edge, the densely forested plateau will break onto a sweeping plain. A picnic lawn will lie along this area's southern edge, providing space for lounging, kite-flying and enjoying the scenery. The rest of the area will be dominated by the innovative Founder Seed Farm. This seven-acre matrix of cultivation plots will form a vibrant mosaic of vegetation native to Staten Island. The Founder Seed plots will be operated by the Department of Parks & Recreation's Greenbelt Native Plant Center and will be used to propagate seed mixes for use at Freshkills Park. Similar to the tree nursery, the Farm will allow the public to observe a working landscape that will, in turn, help transform the rest of the site. A further transformation will take place after five years of operation, when nature will be left to take its course and the area will become a flowering meadow.

## THE WATERFRONT

Main Creek flows south from the William T. Davis Wildlife Refuge, a beautiful site first set aside for preservation in 1928. Providing views into the wildlife refuge and its thriving ecosystem is a central goal of North Park development. Two structures will grant these views: an Overlook Deck at the end of the picnic lawn path and a Bird Observation Tower at the end of the multi-use path. Both structures will be situated at water's edge and provide views not only of the wetlands and their wildlife, but also of the colossal landfill closure effort underway on East Mound, as well as sweeping vistas encompassing the rest of the rest of the Freshkills Park site and the skylines of both Jersey City and Lower Manhattan.

## SIGNIFICANCE

Development of North Park aims to extend the rich habitat of the Wildlife Refuge and to create space for recreation and relaxation. Human activities, whether cultivation of the tree nursery or propagation of native seed stock, will enrich the surrounding ecosystem. The ecosystem, in turn, will enrich human activities with more birds for the bird watchers and trees for the shade seekers, a backdrop of blooming meadows and bustling wetlands. Over the next few years, North Park will strive to become both a laboratory of new sustainable practices for the continuing transformation of Freshkills Park and a destination in its own right, a place of active use and quiet recuperation, a proving ground for new restoration practices and a confident first step on a long path of change.

# Landfill infrastructure, continued

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and soil or cement. The cutoff walls are embedded into a layer of low-permeability soils, mostly clay, that serve as a natural liner under the major part of the landfill mounds. Groundwater and surface water monitoring wells are located around the site to insure that chemicals are not seeping into the surrounding aquifiers.

Leachate is collected throughout the site and channeled to a leachate treatment plant located south of West Mound. Here the leachate is treated for ammonia and suspended solids through a biological and chemical treatment process. The leachate treatment plant separates the water from the solid materials and chemicals. The clean water must meet quality permit standards so that it can be discharged into the Arthur Kill without having negative effects upon the ecosystem and environment. The remaining materials, known as "leachate cakes," are disposed of in a landfill designed to accept this type of waste.

Currently, the leachate treatment plant processes up to 600,000 gallons of leachate per day. As with the landfill gas, the amount of leachate collected will wane and eventually become negligible as the landfill ages.

DSNY and the Department of Parks & Recreation have entered into a partnership for the management of Fresh Kills. They are committed to ensuring that the infrastructure systems at Fresh Kills that protect environmental and public health on and around the site remain uncompromised throughout the upcoming construction and use of Fresh Kills as a public park. The monitoring and maintenance of the landfill is an integral part of the successful functioning of the park.

# Wildlife Spotlight: the West Shore's growing population of white-tailed deer

PHOTO BY VALERIE ABBOTT

## White-tailed Deer
## *Odocoileus virginianus*

Range: Found throughout most of the United States and Canada, Mexico, Central America, northern parts of South America, and some parts of Europe.

Size: Males range in weight from 130 to 220 pounds; females range in weight from 90 to 200 pounds. They range in size from 3 to 3.5 feet tall.

Lifespan: most deer live an average of 2 to 3 years, although it can be as long as 20 years. Few live past 10 years.

There have been quite a few deer spotted at Fresh Kills. In July of this year, a tour group caught sight of a doe and fawn at the top of North Mound. That was just one of numerous reports of deer sightings around Staten Island. According to a state study released in May of this year, there are at least 24 deer in the borough, mostly concentrated on the western side of the island.

White-tailed deer are the most abundant of the large North American mammals. They are extremely agile and can reach speeds of 30 miles per hour even through uneven forest terrain. During the summer, deer usually keep to meadows and fields, while in the winter they use the forest as protection from the harsh elements. The diverse habitat types of Fresh Kills make an ideal location for their habitat.

Deer depend mainly on their sense of smell to detect danger and will raise their tail–exposing a white underside–to communicate danger to other deer. In wild areas, deer are preyed on by large predators such as wolves, coyotes and bears. Humans are the only threat posed to deer on Staten Island.

Deer feed primarily on young leaves, fresh grasses, shrubs, fungi and soft twigs. They are excellent swimmers and often enter large bodies of water to escape predators or insects. It is said that many deer have swam across the Arthur Kill from New Jersey to inhabit Staten Island.

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## Native trees to be planted at Freshkills Park: How many do you know?

**First row**: American Sycamore; Eastern Red Cedar; Flowering Dogwood; Paper Birch.
**Second Row**: River Birch; Tulip Poplar; White Pine, Red Maple

**In Memory of**
**Sheila Metcalf**

Dedicated Fresh Kills Project Manager for the New York City Department of City Planning and the New York City Department of Sanitation

### Freshkills Park
Department of Parks & Recreation
www.nyc.gov/parks/freshkillspark

### Project Partners and Consultants
Department of City Planning
www.nyc.gov/freshkills

Department of Sanitation
www.nyc.gov/html/dsny

Field Operations,
Landscape Architecture
www.fieldoperations.net

### Related City Initiatives
PlaNYC 2030
http://www.nyc.gov/planyc2030/

MillionTreesNYC
http://www.milliontreesnyc.org

### Composting, Recycling and Ecological Resources
Council on the Environment of NYC
http://www.cenyc.org/

The New York City Compost Project
http://www.nyccompost.org/

NYC Green Apple Map
http://www.greenapplemap.org/

NYC WasteLe$$
http://www.nyc.gov/html/nycwasteless/html/recycling/recycling_nyc.shtml

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# FreshkillsPark

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