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May 10, 2018

Mr. Richard Lenz, P.E.
Commissioner, Department of Public Works
Town of Oyster Bay
150 Miller Place
Syosset, New York 11791

**Re: Radiological Survey at Former Syosset Landfill
150 Miller Place, Syosset, New York 11791
H2M Job # TOBY1801**

Dear Mr. Lenz,

In accordance with your request, H2M architects + engineers (H2M) conducted a limited radiological survey at the former Syosset Landfill on Miller Place in Syosset, New York. This report summarizes the findings from field surveys conducted by H2M on April 24th, April 26th and May 8th during which a total of four (4) site walkthroughs were conducted. Provided herein is a summary of all survey findings.

The objective of the radiological survey was to evaluate the potential for the presence of radiological contamination at the former landfill, and to locate such detectable radiological sources where they may exist above background levels. This limited survey primarily focused on the perimeter of the former landfill. A Site Location Map is provided as Figure 1.

Background

The former Syosset Landfill operated from about 1933 to 1975 and comprises approximately 38 acres. During most of the active life of the facility there were no restrictions on wastes brought to and deposited in the landfill. Based on various site investigations and the Environmental Protection Agency (EPA) Record of Decision (ROD) for the site, a considerable range of contaminants have been found at the former landfill including heavy metals, non-metals, chlorinated solvents, various organic compounds, and other constituent chemicals. The site was placed on the Superfund National Priorities List (NPL) in September 1983. Following site remediation and capping in the late 90's, the EPA removed the site from the Superfund Program National Priorities List in April 2005. Part of the site remediation process also included installation of a soil ventilation system. In its third five-year review report dated 2012, the EPA stated that "the implemented remedy for the Syosset Landfill Superfund Site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected, as long as the Site use **does not change** and the implemented engineered and institutional controls are properly operated, monitored, and maintained." (*emphasis added*)

Methodology

H2M performed the radiological surveys over the course of three site visits which took place on April 24, April 26 and May 8, 2018. During each site visit the weather was clear and sunny and conducive to the work being performed. A site plan showing the survey path is provided as Figure 2. The survey path, which was recorded using a Trimble Geo7X GPS instrument, was walked a total of four times over the three site visits at a pace of approximately one mile per hour. A site location map showing areas in which elevated readings were detected is provided as Figure 3.

A Ludlum Model 2241 Geiger Survey Meter with a handheld Ludlum Model 44-9 "pancake" Alpha, Beta and Gamma Detector was used on each visit in order to screen for radiological detections at the site. The device was held at approximately waist height or one meter from the ground and was set to "fast" mode. All instrumentation used in this survey was obtained from Pine Environmental Services LLC. Documentation from Pine Environmental showed the calibration of the instrument used on April 24 and 26, 2018 to have been completed on December 29, 2017, and calibration of the instrument used on May 8, 2018 to have been

completed on April 27, 2018. All calibrations were performed by Suntrac Services, Inc and are valid for one year from the date of calibration.

While the Geiger Survey Meter used was capable of detecting alpha, beta and gamma-types of radiation, it is not considered likely that any subsurface alpha- or beta- emitting radiation source, if present, could have been detected in the course of this survey due to interference from the capping and paving layers throughout the site. Additionally, please note that given the size of the site (38 acres) and some accessibility issues, it was not feasible to survey all site surface areas.

Measurements of radiation were collected in units of micro roentgens per hour ($\mu\text{R/hr}$) which is consistent with standard protocols for this type of survey. Areas found to consistently (on all survey occasions) show higher levels of radiation than elsewhere on site were documented.

The Geiger Survey Meter was also used to assess potential radiation from a random selection of the landfill vents across the site.

Results and Discussion

Typical background levels of radiation detected outside the site were found to be in the range of 5 to 20 $\mu\text{R/hr}$. Levels detected throughout the site using the same device were generally in the same range of 5 to 20 $\mu\text{R/hr}$ with one exception. In one area, the detected radiation levels were slightly higher than elsewhere on the site during each field survey. This area is shown on Figure 3 and is located in the parking lot between the CNG fueling facility and the fence to the north of the Department of Public Works buildings at the southwest corner of the site. The detected radiation levels in this area were recorded as high as 32 $\mu\text{R/hr}$ on April 24 and 26, 2018. On May 8, 2016, the highest radiation level was recorded to be 26 $\mu\text{R/hr}$.

Radiation levels detected at the landfill vents were recorded to be no more than 15 $\mu\text{R/hr}$.

For general reference purposes, according to the United States Nuclear Regulatory Commission (USNRC), "On average, a U.S. resident receives an annual radiation exposure from natural sources of about 310 millirem (3.1 millisieverts or mSv). Radon and thoron gases account for two-thirds of this exposure. Cosmic, terrestrial, and internal radiation account for the rest."

A 310 millirem per year average exposure level is equivalent to approximately 36 $\mu\text{rem/hr}$. The information gathered as a part of this survey does not include an indication as to the types of radiation detected (alpha, beta and gamma) and therefore it is not possible to convert directly between units of rem and roentgen. However, if the conservative assumption is made that all radiation detected in the course of this survey was gamma radiation being emitted from the subsurface of the capped former landfill (alpha and beta emissions are assumed incapable of penetrating the landfill cap), then 36 $\mu\text{rem/hr}$ would be approximately equal to 36 $\mu\text{R/hr}$. For the purpose of interpreting the survey results, a typical background level of radiation has been assumed to be 36 $\mu\text{R/hr}$. No reading collected in the field was found to exceed 36 $\mu\text{R/hr}$.

Conclusion

No radiation readings were detected at the former Syosset landfill site that were above the assumed typical annual average exposure levels of radiation. However, the survey did identify one area in which the recorded radiation levels were repeatedly higher than elsewhere on site. This area is shown on Figure 3 and is located in the parking lot between the CNG fueling facility and the fence to the north of the Department of Public Works buildings at the southwest corner of the site.

The information contained herein is limited to the physical data and visual inspections conducted by H2M during the survey. All findings stated in this report are based upon facts and circumstances as they existed at the time of the survey and at the time that this report was prepared. A change in any of the site conditions, facts or circumstances upon which this report is based may affect the findings expressed in this report.

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If you should have any questions or comments, please contact the undersigned at (631) 756-8000, extension 1483.

Very truly yours,

H2M architects + engineers

A handwritten signature in black ink, appearing to read 'P. Lageraen'.

Paul R. Lageraen, P.E., P.G.
Vice President | Environmental

A handwritten signature in black ink, appearing to read 'T. King'.

Thomas King, CIH
Project Engineer

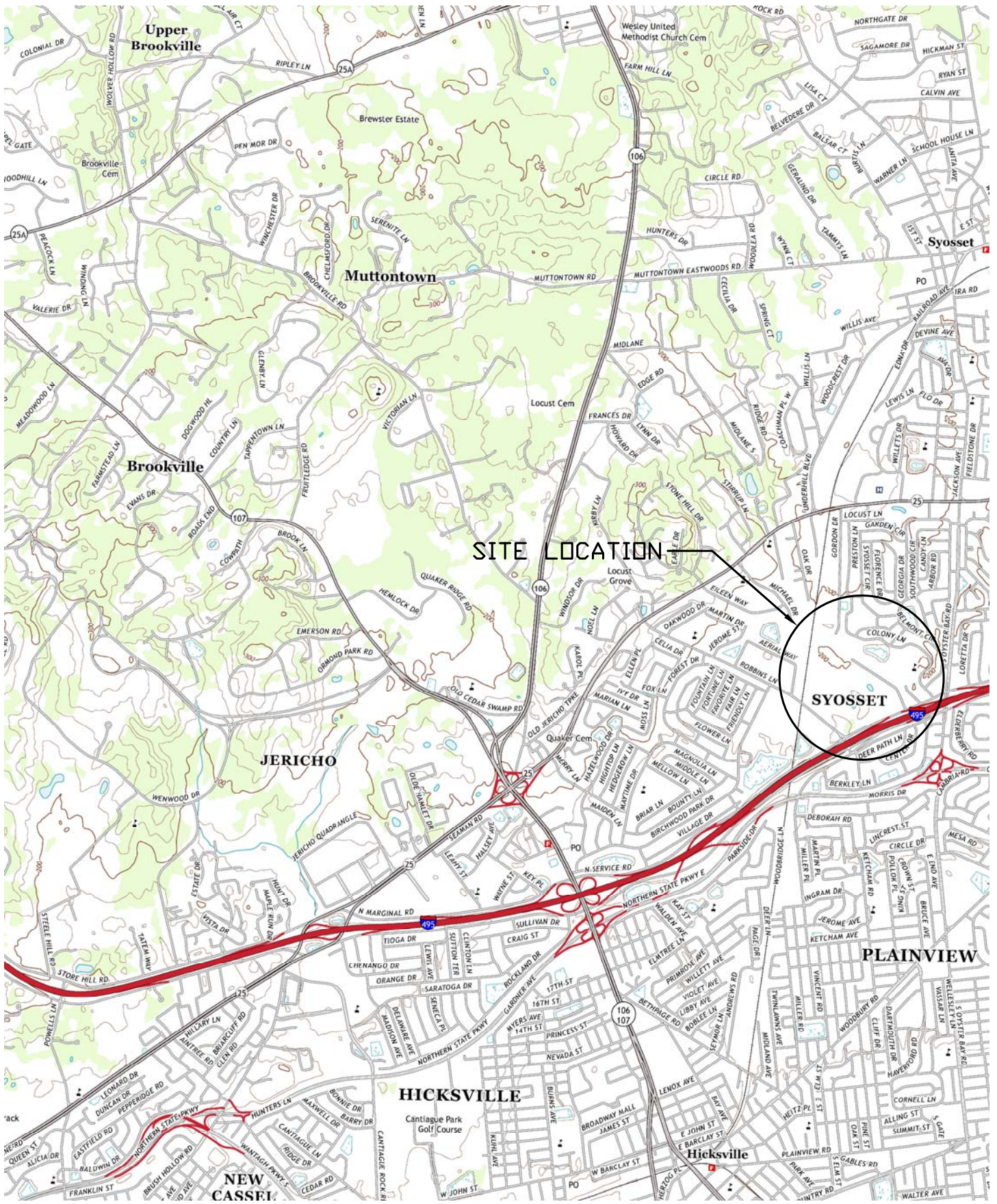


Figure 1: Site Location Map

SCALE: 1" = 3000'



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CLIENT **FORMER SYOSSET LANDFILL AND TOWN OF OYSTER BAY DEPARTMENT OF PUBLIC WORKS FACILITY**

150 MILLER PLACE
SYOSSET, NY 11791



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend:



Radiological Survey Path

0 0.045 0.09 0.18 Miles



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Figure 2:
Radiological Survey Path

SCALE:
Shown on Figure



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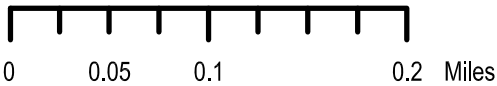


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend:



Approximate Area with Slightly Higher Radiation Readings



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Figure 3:
Approximate Area with Slightly Higher Radiation Readings

SCALE:
Shown on Figure



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