

**DATA USABILITY ASSESSMENT REPORT
MANHASSET BAY PROTECTION COMMITTEE
TOWN OF NORTH HEMPSTEAD, NEW YORK**

Prepared for:

**THE MANHASSET BAY PROTECTION COMMITTEE
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DECEMBER 2022

Funding for this project was provided from the New York State Environmental Protection Fund as administered by the New York State Department of Environmental Conservation. The opinions, results, findings and/or interpretation of data contained therein are the responsibility of the Contractor and do not necessarily represent the opinions, interpretations, or policies of New York State or the Department of Environmental Conservation.


MANHASSET BAY PROTECTION COMMITTEE
DATA USABILITY ASSESSMENT REPORT

APPROVAL SHEET

Managers and Participants – The undersigned parties certify that the Data Usability Assessment Reports (DUAR) presented herein accurately represents their planning and execution efforts with regard to this completed project.

 _____	12/23/2022 _____
Sarah Deonarine – Project Manager Manhasset Bay Protection Committee	Date
 _____	12/23/2022 _____
Robbin A. Petrella – Senior Associate D&B Engineers and Architects	Date

The undersigned Quality Assurance Officer (QAO) has reviewed the DUAR and certifies that the DUAR has been completed using the proper format and required contents. The QAO’s certification does not guarantee the overall quality of the project described by the DUAR, nor does it imply that the QAO granted permission to the project staff to proceed without an approved Quality Assurance Project Plan (QAPP).

 _____	12/23/2022 _____
Zachary M. Smith – DOW Assistant Quality Assurance Officer NYS Department of Environmental Conservation Bureau of Water Assessment and Management	Date

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1.0 PROJECT MANAGEMENT

1.1 Data Usability Assessment

The goal of the data usability assessment is to evaluate the procedures used to collect and compile environmental data from the Manhasset Bay Protection Committee (henceforth “MBPC”) investigation of the Manhasset Bay bacteriological and water quality data available from the summer 2022 and to combine the results from the verification of the field sampling and analytical procedures with the results of data validation to provide a summary for data users regarding any limitations in the data set.

1.2 Project/Task Organization

The following people and parties participated in this project and its oversight.

Sarah Deonarine, Manhasset Bay Protection Committee Director – Project Manager

Responsibilities

1. Oversee project administration and coordination of interactions with NYSDEC.
2. Draft maintain and modify (when necessary) the official approved copy of the QAPP.
3. Determine project strategy and overall design, including site location, parameter selection, sampling frequency, etc.

NYSDEC Division of Water Standards and Analytical Support Section

Zachary M. Smith – Assistant Quality Assurance Officer (AQAO), NYSDEC DOW, Albany, NY, is responsible for review of the DUAR for format and required contents. The AQAO does not certify the overall quality of this project as presented by the DUAR. The AQAO is organizationally independent and not subject to the authority of any persons in the Manhasset Bay Protection committee (MBPC). (518) 402-8234. zachary.smith2@dec.ny.gov.

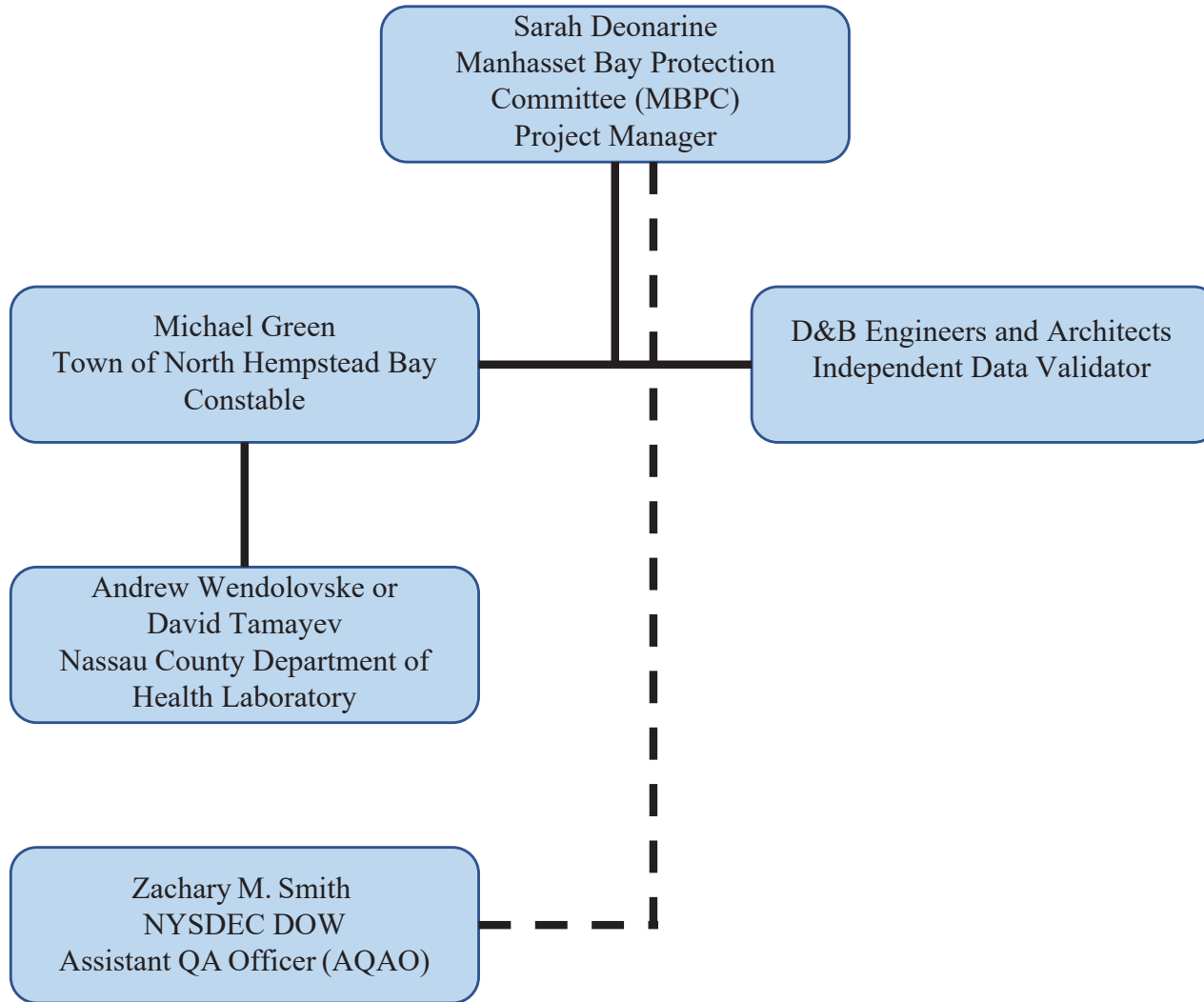
Illustrated in the project organization chart, **Figure 1-1**, are the lines of responsibility and communication for personnel involved in this project.

1.3 Problem Definition/Background

The Manhasset Bay Protection Committee (MBPC) is an inter-municipal organization formed in 1998, focused on addressing water quality and coastal issues in Manhasset Bay with a coordinated, watershed-level approach. The 15 member municipalities are: Nassau County, the Town of North Hempstead, and the villages of Baxter Estates, Flower Hill, Great Neck, Kensington, Kings Point, Manorhaven, Munsey Park, Plandome, Plandome Heights, Plandome Manor, Port Washington North, Sands Point, and Thomaston. More information on the Committee is available at manhassetbayprotectioncommittee.org. The Committee's goals are to protect, restore, and enhance Manhasset Bay so as to insure a healthy and diverse marine ecosystem while balancing and maintaining recreational and commercial uses. Tasks that help toward these goals include the annual water quality monitoring and regular assessment of Manhasset Bay.

The goal of this project was to collect 2022 Manhasset Bay summer swimming season bacteriological and water quality data and to correlate that data with any weather or environmental variables present and assess the water quality relative to applicable standards. The Manhasset Bay water quality monitoring program encompassed weekly in-bay sampling that included (a) measuring parameters related to the ecological health of the bay and (b) sample collection to measure bacteria levels within the bay. Sampling began June 6th and continued until August 29th, all on Monday mornings with the exception that the sampling for the July 4th week was moved to Wednesday, July 6th (13 sampling dates).

The United States Environmental Protection Agency (EPA) is charged with monitoring swimming beaches for public health and safety. To do that, the EPA recognized enterococci as the indicator of the presence of fecal material in water, which could also indicate the presence of disease-causing bacteria, viruses, and protozoa; cumulatively, pathogens. Enterococci are not themselves harmful to humans.



The New York State Department of Environmental Conservation (NYSDEC) recognizes both enterococci and fecal coliform as indicators of the presence of disease-causing organisms and has set the following ambient water quality standards as identified in NYCRR 6 Part 703.4:

1. Based on a summary statistics (geomeans with no more than 10 percent exceedance), the upper value for the density of bacteria for ambient water quality (NYCRR 6 Part 703.4) shall be:
 - The monthly geometric mean, from a minimum of five examinations for fecal coliforms, shall not exceed 200 CFU/100 mL for Class SB and SC waters.
 - For Enterococci the geometric mean of samples collected over any consecutive 30-day period shall not exceed 35 CFU/100 mL and no more than 10 percent of the samples collected in the same 30-day period shall exceed 130 CFU/100 mL for Class SA and SB waters.

1.4 Project/Task Description

Manhasset Bay is one of the westernmost estuarine embayments of the north shore of Long Island, NY. The Bay is, therefore, influenced by activities in and around New York City and the Long Island Sound, but this report aims only to investigate what is happening within Manhasset Bay. According to the New York State Department of Environmental Conservation's (NYSDEC) Priority Waterbodies List, Manhasset Bay is impaired by pathogens (as indicated by the bacteria fecal coliform and enterococcus) from stormwater runoff, which is the focus of this analysis and report.

Manhasset Bay is broken into three portions according to the New York State Department of Environmental Conservation (NYSDEC) Waterbody Inventory/Priority Waterbodies List, as shown in **Figure 1-2**. Portion 1 is comprised of Bay waters southwest of a line from Hewlett Point to Barker Point, southwest of a line from Plum Point to Port Washington Yacht Club dock, and north of a line running east of Harbor Way dock. The known major pollutants in Portion 1 include dissolved oxygen/oxygen demand, nutrients, and pathogens sourcing from sewage treatment plants and urban/stormwater runoff. Portion 2 is Bay waters northeast of a line from Plum Point to Port



Washington Yacht Club dock, with pathogens from urban/stormwater runoff as the known major pollutant. Portion 3 is made of Bay waters south of a line running east from Harbor Way dock, which also has pathogens as the known major pollutant from urban/stormwater runoff.

Portions 1 and 2 of Manhasset Bay are also on the NYS Section 303(d) List of Impaired Waters Requiring a total maximum daily load (TMDL) or Other Strategy. Portion 1 is listed as a shell fishing restricted impairment for pathogens from urban/stormwater runoff requiring TMDL development. Portion 2 is listed as an individual waterbody segment with pathogen impairment from urban/stormwater runoff requiring TMDL development.

This DUAR reviewed the Manhasset Bay bacteriological and water quality data available from the summer of 2022, to determine the validity and usability of the sample results for assessing the water quality of Manhasset Bay.

There are a total of seven (7) water quality monitoring sites throughout Manhasset Bay to represent full coverage of the Bay in areas experiencing various stressors. Weekly sampling was conducted on Mondays from June 6th through August 29th, 2022 (with the exception that the July 4th event was moved to Wednesday, July 6th), collecting indicator bacteria (enterococcus and fecal coliform) samples using a simple dip method at the water surface. Additional data was collected from external sources, including precipitation from LaGuardia Airport, the closest weather station.

1.5 Quality Objectives and Criteria

Data quality objectives are based on precision, bias, accuracy, representativeness, comparability, completeness, and sensitivity.

- Precision of sampling is based on taking duplicate field measurements at one random station chosen per sampling event by random number generator before departing Town Dock and calibration of the YSI multiparameter probe prior to every sampling at the Town Dock.
- Accuracy and Bias is based on field blanks, trip blanks, laboratory blanks (e.g., for bacteria) and calibrations results. A trip blank was taken during each sampling event.

- Data Representativeness is determined by the sampling sites representative of conditions for a specific area of the water body (or a specific pollution source), any abnormal or episodic conditions that may affect the representativeness of sample data are noted and maintained as metadata, and sample-collection timing and frequency of in-harbor stations are selected to capture data that are representative of a range of conditions (e.g., wet/dry weather, and rising/ebb tide).
- Comparability is determined based on sites data result using established field protocols, standard laboratory methodologies and sampling consistently on the same day of the week and at similar times of day, documenting methods, analysis, sampling sites, times and dates, sample storage and transfer, as well as the laboratory to produce comparable data by following established procedures.
- Data completeness is determined by at least 90% of the anticipated number of samples on a particular sampling date being collected, analyzed, and used, data is tracked by keeping detailed and complete sample and survey records, data was summarized via a report detailing number of anticipated samples, number of valid results, and percent completion for each parameter and the anticipated number of samples will vary according to tidal cycles and access to monitoring Stations.

1.6 Special Training/Certification

The Project Manager ensured that all individuals involved with the project received and were familiar with the approved QAPP and the Standard Operation Procedure (SOP) prepared for this project to ensure proper adherence to the procedures outlined within. The Project Manager/Field Team Leader was trained in the operation, calibration, and maintenance of field-data-collection equipment and familiar with appropriate field sampling procedures. Training was provided by an individual experienced with similar monitoring equipment and sampling techniques. The Project QA Officer and Project manager/Field Team Leader has prior water-quality monitoring experience through this program, a similar program, or through work or education. The date and specifics of Project Manager/Field Team Leader training will be recorded and kept in the annual water-monitoring binder along with other training notes.

Field Samplers (staff, and/or municipal employees) met with program managers for information regarding the monitoring program. Individuals were formally trained before

participating in any water-quality monitoring. Training included discussion of the approved QAPP, the program's SOPs, and any other procedures that were necessary including:

- Monitoring-program background and purpose;
- The QAPP and SOPs;
- Field Equipment care and maintenance;
- Sample collection procedures;
- Sample Handling and labeling; and
- Potential safety hazards as listed in the Sampling Plan SOP and safety plan.

1.7 Documents and Records

1.7.1 Report Format/Information

Data was provided by the NCDOH laboratory, a NYSDOH ELAP accredited laboratory, in an excel format.

1.7.2 Document/Record Control

Records cannot be amended once written (e.g., sampling data). Documents maintained for this project (e.g., QAPPs, SOPs) may be amended based on changes in regulations and or monitoring requirements. A QAPP and an SOP for use of the YSI meter has been prepared and approved for this project. The sample data was provided electronically in an excel spread sheet by the NCDOH laboratory to the MBPC. All data is maintained by the MBPC in an electronic format. The data is available to the public and users on the MBPC website (<http://www.manhassetbayprotectioncommittee.org/links.html>)

1.7.3 Storage of Project Information

All data storage, including the YSI field parameter readings, for these project efforts was saved in Microsoft Excel. Original field data sheets from sampling events are stored by the Town Bay Constables.

The Project Manager retains copies of all management reports, memoranda, and all correspondence between NYSDEC and project personnel identified in Section 1.2.

1.7.4 Backup of Files

The electronic files have been backed up periodically. The original field data sheets from sampling events are stored by the Town Bay Constables.

2.0 DATA GENERATION AND ACQUISITION

2.1 Sampling Design

A key task in this project was to develop a sound statistical methodology for collecting and analyzing data, in order to draw inferences related to the selected performance measures. The major quality objective were collect representative data that accurately reflect the environmental conditions of the project area.

The water quality monitoring encompassed seven (7) sites spread throughout Manhasset Bay. These sampling locations were selected based on the need to get full coverage of the Bay in areas experiencing different stressors. These sampling locations are detailed below in **Table 2-1** and **Figure 2-1**. Once per week, each Monday, between Memorial Day and Labor Day of each year, the Town of North Hempstead bay constables will collect data at these seven (7) disparate sites around Manhasset Bay including: site conditions (air and water temperature, wind speed and direction, weather, wave height), water quality parameters (YSI meter), secchi (visibility) measurements and water depth as well as surface water samples for bacteria counts. The Nassau County Department of Health analyzed the water samples for fecal coliform and enterococci (CFU/100mL) according to the approved QAPP and the standard operating procedures of the Nassau County Department of Health. The data from these efforts was provided to the MBPC Executive Director (henceforth Director) in digital spreadsheet format.

2.2 Sampling Methods

2.2.1 Preparation of Data Collection Instruments

Field instruments requiring calibration, such as the EPA YSI multiparameter probe, were calibrated prior to the start of every sampling event at the Town Dock. Proper decontamination procedures were conducted between uses during sampling events.



Table 2-1: Manhasset Bay Water Quality Monitoring Sample Locations

Station ID	Site Name	Location Description	Latitude (N)	Longitude (W)
MB-1	Leeds Pond	Eastern shore of the Bay near the outlet of one of the major freshwater sources	40.81592	-73.70592
MB-2	Kennelworth	Northwestern shore near the mouth; this station experiences a lot of flushing with Long Island Sound	40.82646	-73.72844
MB-3	Manorhaven	Northern shore near Sheets Creek	40.83022	-73.71578
MB-4	NUN 4	Aide to navigation buoy in the central channel of the Bay. Likely experiences a lot of flushing.	40.82946	-73.71794
MB-5	Baxter Beach	Northeastern shore near a lot of development and the outfall for the Port Washington STP	40.83412	-73.70142
MB-6	Manorhaven Beach	Northern shore near a Town recreational facility	40.83763	-73.71495
MB-7	Great Neck (2017-2018)	Southern shore where the Bay gets extremely shallow and more exposed to freshwater inputs. Site is near the outfall for the Great Neck STP, as tidal stage allows.	40.80224	-73.71337

2.2.2 Summer of 2022 Sampling

Sampling was performed once per week on Monday mornings from June 2022 through August 2022 at seven (7) locations around the Bay by Town Bay Constables. Bacteria samples were collected using a simple dip method at the surface. Depth was determined using a depth sounder on the boat, when available. Field readings including temperature, dissolved oxygen, pH, and salinity readings were taken at the surface (approximately one foot depth to top of probe) using the YSI multiparameter probe, and turbidity measurements taken via secchi disk with half-meter markings on the line. Data measurements, site conditions and other information was recorded on a data sheet and labeled with the Station ID. Every morning after sampling, Nassau County Department of Health personnel collected the refrigerated bacteria samples along with a trip blank from the Town Dock and performed the analysis at the NCDOH laboratory.

2.3 **Sample Handling and Custody**

Samples were retrieved by Nassau County Department of Health personnel and refrigerated until they performed the analysis at the NCDOH laboratory. Sample handling and transfer was conducted under typical chain of custody procedures.

2.4 **Analytical Methods**

2.4.1 Field Measurement Methods

In 2022, field readings including temperature, dissolved oxygen, pH, and salinity readings were taken at the surface (approximately one foot depth to top of probe) using a YSI multiparameter probe, and turbidity measurements were taken via secchi disk with half-meter markings on the line.

2.4.2 Field Analyses Methods

No field analyses were conducted as part of the 2022 sampling event.

2.4.3 Laboratory Analyses Methods (Off-Site)

Bacteria samples collected throughout sampling events were analyzed by the Nassau County Department of Health laboratory for fecal coliform by SM9222D-2006 and enterococci by EPA 1600. These are approved methods provided by the NYSDOH.

2.5 **Quality Control**

For quality control purposes, duplicate measurements were taken at one station chosen at random per sampling event in 2022.

2.5.1 Data Entry QA Procedures

Project data was entered directly into Microsoft Excel, including field reading data measured using the YSI multiparameter probe and secchi disks. The YSI data was downloaded directly from the unit into spreadsheets.

2.5.2 Crosschecking Data

Data was crosschecked by having a second staff member checking the imported data with the raw data provided on the field forms.

2.5.3 Data Anomalies

Data anomalies were not identified.

2.6 **Instrument/Equipment Testing, Inspection, and Maintenance**

For instruments operated by/in the NCDOH laboratory, testing, inspection, and maintenance was performed in accordance with guidelines detailed by the analytical methods and

NYSDOH ELAP. Contract laboratories should maintain appropriate service contracts for laboratory instruments and perform routine instrument maintenance at intervals suggested by the manufacturer or by internal laboratory SOP.

The field equipment known as a YSI handheld multiparameter probe, displays data, such as temperature, dissolved oxygen, pH, and salinity, on a handheld meter when the probe is lowered into the water column. These measurements were taken at the surface, approximately one-foot depth to top of probe. This equipment allowed for significantly more diverse data collection.

The MBPC collected secchi disk depths at each station. The 78-010 Fieldmaster Secchi Disk is a weighted 200 mm diameter plastic disk with two white quadrants and two black quadrants. It is lowered into the water column until it can no longer be seen by the observer. This depth provided a relative measure of turbidity, which is important to note as marine plants and algae need sunlight to grow.

2.7 Instrument/Equipment Calibration and Frequency

For instruments operated by/in the NCDOH laboratory, calibrations and confirmations of calibration were performed in accordance with guidelines detailed by the analytical methods. The NCDOH laboratory maintains appropriate service contracts for laboratory instruments and perform routine instrument maintenance at intervals suggested by the manufacturer or by internal laboratory SOPs.

Field instruments requiring calibration, such as the EPA YSI multiparameter were calibrated prior to the start of every sampling event at Town Dock. Calibration data was reviewed and found to meet manufacturers requirements.

2.8 Inspection/Acceptance for Supplies and Consumables

Prior to sampling the YSI was inspected and calibrated daily. All of the calibrations meet requirements and all field data has been deemed usable.

2.9 Non-Direct Measurements (i.e., Secondary Data)

Local weather, specifically precipitation levels, and tide data over the time periods specified were collected from external sources for this report. Precipitation data from LaGuardia Airport, the closest weather station, was gathered from the NOAA National Centers for Environmental Information (NCEI) data request website. Tidal data from NOAA’s Kings Point Station (ID #8516945) was accessed from NOAA’s Center for Operational Oceanographic Products and Services website. These non-direct measurements are detailed in **Table 2-2** below.

Table 2-2: Elements of Manhasset Bay Water Quality Monitoring

Parameter	Location	Analyzer or Method	Location of Analysis
Dissolved Oxygen	MB-1 through MB-7	YSI Meter	Field
Conductivity	MB-1 through MB-7	YSI Meter	Field
pH	MB-1 through MB-7	YSI Meter	Field
Water Temperature	One station for electronic meter validation	YSI Meter	Field
Air Temperature	One measurement at each station during monitoring	Calibrated Digital Thermometer	Field
Water Clarity	MB-1 through MB-7	LaMotte Secchi Disk	Field
Fecal Coliform	MB-1 through MB-7	Membrane Filter, SM 9222 D-2006	Nassau County Department of Health
Enterococci	MB-1 through MB-7	Membrane Filter, EPA 1600	Nassau County Department of Health
Precipitation	LaGuardia Airport	NOAA National Centers for Environmental Information (NCEI)	Field

Table 2-3: Non-Direct Measurements (i.e., Secondary Data)

Data Sources	Intended Use	Rationale for Use	Acceptance Criteria
NOAA National Centers for Environmental Information (NCEI) – LaGuardia Airport	Identifying precipitation data and patterns for the general project area.	Commonly accepted source of precipitation data for the area.	All data must have been collected for the same time as sample collection.
NOAA’s Center for Operational Oceanographic Products and Services – Kings Point Station	Identifying tidal data and patterns for the general project area.	Commonly accepted source of tide data for the area.	All data must have been collected for the same time as sample collection.

2.9.1 Determining Limits to Validity and Operating Conditions

Of the seven (7) sampling sites included in the water quality monitoring, several are located along the perimeter of the Bay, and therefore may miss some water quality dynamics of the central Bay. However, given the screening level nature of this monitoring, these sample locations have been deemed sufficient for these sampling efforts. In addition, it is anticipated that the largest impacts on water quality will be closer to the shore and, therefore, these sample sites can serve as a proxy for what is happening in the central Bay.

An additional data limitation was that Manhasset Bay experiences a large tidal range and some portions of the Bay are getting shallower. However, all locations were accessible for sampling.

One final potential limitation of data was the use of secondary sources for both tidal and precipitation data. The nearest NOAA tidal gauge is located in King’s Point, so this data was used as representative of all of Manhasset Bay. Similarly, the precipitation data collected at LaGuardia Airport by NOAA was also used as representative of the entire Bay for the purposes of this project.

2.10 Data Management

As part of this project, The Manhasset Bay Protection Committee (MBPC) and D&B Engineers and Architects (D&B) developed a data management strategy which is consistent with the existing Manhasset Bay Protection Committee's Quality Management Plan.

Field data was collected on a field data sheet during each sampling event. The field data was compiled electronically after each event and reviewed by another person to confirm electronic file integrity. The electronic data will be stored on MBPC's computer network and the MBPC website (<http://www.manhassetbayprotectioncommittee.org/links.html>). The electronic file is backed up periodically. The original field data sheets are maintained on file at Town Bay Constables for a minimum of three years.

3.0 ASSESSMENT/OVERSIGHT

3.1 Assessment and Response Actions

Data was collected over 13 weeks in 2022 as part of the yearly summer monitoring between Memorial Day and Labor Day. Town of North Hempstead bay constables collect data at seven disparate sites around Manhasset Bay on the site conditions (air and water temperature, wind speed and direction, weather, and wave height) as well as surface water samples for bacteria counts. The Nassau County Department of Health then analyzed the water samples for Fecal coliform and Enterococci (CFU/100mL) according to a QAPP maintained by the New York State Department of Health.

3.2 Reports to Management

The data from these efforts are provided to the MBPC Executive Director (henceforth Director) in Microsoft Excel format.

4.0 DATA REVIEW AND EVALUATION

The objectives of data review and evaluation is to assess and summarize the analytical quality and defensibility of data for the end user. Document factors contributing to analytical error that may affect data usability, such as data discrepancies, poor laboratory practices that impact data quality, site locations for which samples were difficult to analyze. Document any “sampling error” that may be identified by the data verification process, such as contaminated trip or equipment blanks, incorrect storage or preservation techniques, improper sampling containers, and improper sampling techniques.

4.1 Data Review, Verification, and Validation

Prior to submitting the data to MBPC the Laboratory reviews and verifies the sample results. Data is reviewed to ensure that the samples were analyzed within the analytical method holding times. The data from the duplicate samples are compared to ensure that the results fall within the QC limits. Any discrepancies are followed up with the laboratory.

Trip blanks were collected with each sampling event. If a trip blank tested positive for enterococci the entire run would be classified as “results questionable”. None of the trip blanks revealed any bacteria so qualification of the data was not required.

4.2 Verification and Validation Methods

The sample results were reviewed to determine that all the samples were analyzed as in accordance with the methods specified.

All sample results were deemed valid and usable for environmental assessment.