RAMBOLL

ENVIRONMENT
& HEALTH

MEMORANDUM

April 14, 2021

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William Hague, P.E., Wood

From: Mark Nielsen, P.E., Ramboll
Jose Sananes, P.E., Ramboll
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Subject: **SA-7 Sediment Remedy Long-Term Monitoring**
Summary of Year 7 Monitoring & Proposed Year 8 Program

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As required by the Consent Order on Sediment Remediation and Financial Assurances (Consent Order) entered by the U.S. District Court (District of New Jersey) on May 28, 2008 in the matter of Interfaith Community Organization et al vs. Honeywell International et al, and Riverkeeper, Inc., et al vs. Honeywell International et al (Civil Action Nos. 95-2097 and 06-0022), Honeywell conducted sediment remediation in the Hackensack River in the vicinity of Study Area (SA) 7 (Site) along Route 440 in Jersey City, New Jersey. The Consent Order, as amended in September 2013, set forth the specific components of dredging, capping, and monitored natural recovery (MNR) for the Sediment Remedy.

In accordance with the *Long-Term Monitoring Plan* (LTMP; revised April 18, 2012) developed as part of the 100% Design for Study Area 7 (100% Design; Cornerstone/ENVIRON 2012), annual monitoring is conducted to assess the on-going effectiveness of the sediment remedy. This report presents the results of monitoring performed by Ramboll US Consulting, Inc. (Ramboll) during Year 7 of the LTMP and the monitoring activities proposed for Year 8.

OVERVIEW OF LTMP

As summarized on Table 1, the LTMP requires bathymetric surveys, cap integrity monitoring, pore water sampling, biological monitoring, and surface sediment sampling at designated locations in Years 1, 2, and 5 of post-construction of the sediment cap areas. After Year 5, the monitoring program is reduced to conducting a bathymetric survey once every five (5) years. In addition, the LTMP requires continued hydraulic and hydrodynamic monitoring to identify high energy events that trigger additional assessment of cap areas[1] (note that no high energy events were identified during the first five years of post-construction monitoring or in Years 6 and 7).

Similar to the cap area monitoring, the LTMP specifies bathymetric surveys and sediment profile imaging (SPI) for monitored natural recovery (MNR) areas in

[1] High Energy Events are defined by the Consent Order as summarized on Tables 1 and 2

Years 1, 2 and 5 of the post-construction period (see Table 2). After Year 5, the monitoring program is reduced to conducting a bathymetric survey once every five (5) years. In addition, the LTMP requires continued hydraulic and hydrodynamic monitoring to identify high energy events that trigger additional assessment of MNR areas.

As specified in the LTMP and confirmed in the LTMP Year 5 Implementation Report (Year 5 Report; Ramboll, May 2019), cap integrity monitoring, pore water sampling, biological sampling, surface sediment sampling, and SPI were discontinued after Year 5, as the results of the first five years of post-construction monitoring demonstrated that the remediation areas remain stable relative to constructed conditions.

Bathymetric surveys will be conducted every 5 years. All long-term monitoring (LTM) activities can be terminated after 15 years (i.e., 2028) and through two high-energy events, or a total period of 25 years (i.e., 2038), whichever is shorter.

SUMMARY OF YEAR 7 ACTIVITIES

As described in the Year 5 Report, the Year 5 LTM activities were conducted during the period of March through December 2018. During this period, construction of Cap Areas 16 and 22 in Droyers Cove was completed in coordination with the beneficial environmental project (BEP); cap construction was completed at the end of Year 5 (i.e., December 2018). As a result, these two cap areas were not included in the routine monitoring completed in Years 1 through 5 of the LTMP. Therefore, these cap areas were inspected in coordination with the BEP inspection program in Years 6 and 7.[2]

The specific scope of inspections and monitoring conducted in Year 7 were as follows:

- Ramboll completed three visual inspections of the Droyers Cove BEP area to document the continued establishment of vegetation and functionality of the BEP. Since Cap Area 16 underlies the BEP area and Cap Area 22 is located proximate to the BEP area, these cap areas were also visually inspected three times in Year 7.[3] The inspections were performed at low tide on April 6, August 19, and October 15, 2020. The results of these inspections were documented in summary logs (see **Attachment A**). Inspection of the Cap Area 16 and 22 long-term monitoring plate locations determined that the long-term monitoring plates were not visible, confirming that the plates have remained buried and no observable loss of cap material has occurred. In fact, some deposition of sediment (up to 3 inches in Cap Area 22) was observed over the caps.
- As required by the LTMP, Ramboll monitored hydraulic and hydrodynamic data to identify high energy events that would trigger additional assessment. The results of hydraulic and hydrodynamic monitoring performed during the first (January through March), second (April through June), third (July through September), and fourth (October through December) quarters of 2020 are attached (**Attachment B**). These monitoring data indicate that no high energy events meeting the defined criteria have occurred during these monitoring periods.

  Note that two storm events (Tropical Storm Fay on July 10, 2020 and Tropical Storm Isaias on August 4, 2020) occurred during the monitoring period, resulting in increases in the ocean level of

[2] The Year 6 inspection and monitoring activities were documented in the summary report memorandum dated January 30, 2020.

[3] Cap Area 22 was not fully exposed at the time of inspection on August 19 and October 15, 2020 (i.e., low tide was not low enough to fully expose the cap surface).

0.67 meters above normal tidal cycling. However, neither event was defined by NOAA as a hurricane event at the time each passed through the site, and therefore did not meet the Consent Order definition of a 10-year storm surge event that would qualify as a high energy event requiring additional assessment. In conjunction with the August 19, 2020 inspection of the BEP area in Droyers Cove, Ramboll visually inspected the portions of the sediment remedy area accessible from the shoreline during low tide to confirm that additional assessment following these two storm events was not warranted. No signs of erosion or damage to the sediment caps were observed.

Consistent with Year 6, only hydraulic and hydrodynamic monitoring and visual inspections were considered necessary to evaluate the integrity of Cap Areas 16 and 22 in Year 7 given the following factors:

1. The results of five years of post-construction monitoring of the SA-7 sediment remedy area within the main portion of the Hackensack River have documented the relative stability of the cap areas completed in 2013.
2. Cap Areas 16 and 22 are located within Droyers Cove, which exhibits lower currents than the main portion of the Hackensack River.
3. Cap Area 16 is integrated within the BEP shoreline wetland area.

In accordance with the LTMP, the next bathymetric surveys of the entire SA-7 sediment remedy area will be conducted in 2023 and 2028 (i.e., 10 and 15 years after completion of the sediment remedy in 2013), unless a high-energy event occurs sooner. These surveys will include Cap Areas 16 and 22.

PROPOSED ACTIVITIES FOR YEAR 8

Consistent with the requirements of the LTMP, in Year 8 (2021), Ramboll proposes to continue to perform hydraulic and hydrodynamic monitoring on a monthly basis to identify any high-energy events that would trigger additional assessment of the remedy area. Ramboll will prepare quarterly reports summarizing the hydraulic and hydrodynamic monitoring results. If a high-energy event occurs in Year 8, Ramboll will implement LTMP field activities (bathymetric survey, diver-assisted cap integrity monitoring, and SPI survey) over the entire sediment remedy area.

In addition, consistent with activities in Years 6 and 7, Ramboll will conduct a minimum of three visual inspections of the BEP Area in Year 8 (April, July, and October 2021) to continue to document the establishment of vegetation and functionality of the BEP. Cap Areas 16 and 22 will be included in these inspections. Following each inspection, summary logs documenting observations will be submitted to Honeywell and after the third inspection, Ramboll will prepare a summary report documenting all Year 8 inspection and monitoring activities.

Please let us know should you have any questions or wish to discuss further.

TABLES

Table 1: Summary of Long-Term Monitoring of the Capped Areas

Monitoring Elements for Capped Areas	YEAR							LTMP Section Reference
	1	2	5	6 to 15	20	25	HEV	
Hydraulic and Hydrodynamic Evaluation								
Routine Monitoring and Analysis	X	X	X					4.1.1
Severe Event Monitoring and Analysis	X	X	X	X			Note 1	4.1.1
Bathymetry	X	X	X	X	X	X	Note 2	4.1.2
Cap Integrity Monitoring	X		X				Note 3	4.1.3
Pore Water Sampling	X	X	X	Note 4, 5				4.2.1
Surface Sediment Sampling			X	Note 5				4.2.2
Sediment Trap Sampling	Note 6							4.2.3
Biological Monitoring	X		X	Note 5				4.3

HEV: Following all High Energy Events

Note 1: After 15 years, high-event assessments will be discontinued if the monitoring objectives have been achieved and maintained for 15 years and through at least two high energy events.

Note 2: Bathymetric surveys will be conducted following up to two high-energy events (if not encountered in the first five years). No additional surveys will be performed if bathymetric surveys show no negative impacts on overall cap integrity (i.e., cap maintains coverage of target areas) for a period of 15 years and through two high-energy events, or a total period of 25 years, whichever is shorter.

Note 3: After Year 5, routine sediment cap integrity monitoring will be discontinued unless data collected during the first five years of monitoring indicate that additional monitoring is warranted. Monitoring will still be conducted following a high-energy event if two such events did not occur within the first five years. Monitoring may also be performed after Year 5 if the bathymetry survey identifies an area of potential erosion warranting further assessment (see Section 4.1.2)

Note 4: The first year of pore water sampling is limited to those areas of potential intermediate groundwater plume upwelling identified in the 2007 *Final Groundwater Investigation Report, Honeywell Study Area 7 Site*; this corresponds to portions of Cap Areas 1, 6, 8, 13, and 18 . In Year 2, sampling will be performed in Areas 1, 8, 13 and 18.

Note 5: After Year 5, sampling will be discontinued, unless the data collected during the first five years of monitoring indicate further monitoring is warranted.

Note 6: If surface sediment sampling of capped areas results in the detection of total chromium concentrations greater than 370 ppm, sediment trap sampling units may be deployed in those areas to further assess site conditions and to evaluate potential contaminant sources.

Table 2: Summary of Long-Term Monitoring of the MNR Areas

Monitoring Elements for MNR Areas	YEAR							LTMP Section Reference
	1	2	5	6 to 15	20	25	HEV	
Hydraulic and Hydrodynamic Evaluation								
Routine Monitoring and Analysis	X	X	X					5.1
Severe Event Monitoring and Analysis	X	X	X	X			Note 1	5.1
Bathymetry	X	X	X	X	X	X	Note 2	5.2
Sediment Profile Imaging	X	X	X				Note 3	5.3
Sediment Core Sampling	Note 4							5.2, 7.2

HEV: Following all High Energy Events

Note 1: After 15 years, severe event assessments will be discontinued if the monitoring objectives have been achieved and maintained for 15 years and through at least two high energy events.

Note 2: Bathymetric surveys will be conducted following up to two high-energy events (if not encountered in the first five years). Following at least two high energy events, bathymetry surveys will be conducted only in MNR areas where erosion may have resulted in more than a 4-inch decrease in the elevation of the sediment surface, based on the results of the hydrodynamic evaluation.

Note 3: Following high energy events, SPI surveys will be performed in MNR areas where erosion may have resulted in more than a four-inch decrease in surface sediment elevations based on the hydrodynamic evaluation and measured observations

Note 4: In the event that a bathymetric survey identifies an Erosional Area as defined in the LTMP, sampling of top 12-inches sediment for total chromium in Erosion Areas is required to confirm that concentrations in top 12-inches remain below 370 ppm.

ATTACHMENT A
YEAR 7 INSPECTION LOGS

ATTACHMENT A.1
APRIL 6, 2020 INSPECTION LOG

SITE INSPECTION LOG

PROJECT NAME:	SA-7 Long-Term Monitoring Year 7	INSPECTION DATE:	April 6, 2020
PROJECT NUMBER:	1690000484	WEATHER CONDITIONS:	SNOWY ☐ RAINY ☐ OVERCAST ☐ PARTLY CLOUDY ☐ SUNNY ☒
PROJECT LOCATION:	SA-7 Droyers Cove BEP	TEMPERATURE (°F):	66 °F
	City of Jersey City, Hudson County, NJ	PREVAILING WIND:	6 - 14 mph (N to NW)
INSPECTOR NAME:	Owen Zalme/Lauren Iacobucci	INSPECTOR SIGNATURE(s):	
INSPECTOR TITLE:	Senior Consultant/Consultant		

The inspection was conducted at low tide, when Cap Areas 16 and 22 and the entire BEP area (including the shoreline stabilization berm) were fully exposed.

TABLE 1. SEDIMENT CAP AREA INSPECTION LOG

CAP AREA	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED
16	• Long-term monitoring plate was not observed (i.e., plate remains buried). • Depth to sediment surface measurements taken at five reference fenceposts indicate an average increase in sediment erosion of 0.5 inches throughout the cap area (with losses up to 2.1 inches in some areas and gains up to 0.5 inches in others) since the October 10, 2019 inspection. ○ Note that the CO required thickness for this area is 12 inches and thickness verification measurements of the shoreline fill portion of the area during construction range from 25 to 40.8 inches. Even considering maximum erosion (3.3 inches since July 2019) and minimum thickness, the existing thickness would be at least 21.7 inches.	1 to 4	• None
22	• Long-term monitoring plate was not observed (i.e., plate remains buried). • As previously observed, on approximately 20% of the cap, and concentrated in depressional areas, 1 to 3 inches of siltation was measured over the armor layer.	24 to 26	• None

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED
SHORELINE STABILIZATION	• Shoreline stabilization appears to be in good condition.	1 to 6	• None
OUTFALL RIPRAP APRONS	• Outfall A: No scouring was observed and no water was observed bypassing the riprap on the west side of the outfall, where scouring had been observed before the October 2019 repairs to the edge of rip-rap apron. On the surface of the western portion of the riprap apron, areas of 1 to 2 inches of siltation were observed. • Outfalls B and C: No new scouring was observed and no water was observed bypassing the riprap on the west side of Outfall B, where scouring had been observed before the October 2019 repairs to the edge of rip-ra. Approximately 1 to 3 inches of siltation (likely displaced shoreline fill) were observed throughout the riprap apron, especially in the vicinity of both outfalls and along the western edge of the Outfall B apron. • Outfall D: Extension piping appears to be in good condition.	7 to 9	• Consider increasing plant density along the transition between the aprons and BEP fill.

PLANTING ZONE A – LOW MARSH	• Overall total vegetative coverage has decreased slightly (relative to October 2019) from 25% to approximately 20%, with slightly higher coverage in areas where plugs are planted in clusters. This decrease is not unexpected given that the vegetation is still in its dormant stage.
	  ○ Few signs of buried or pulled plugs were observed.
	  ○ Plugs appear to be in generally good condition and are healthy. Since the vegetation is generally still dormant, few signs of emergent growth were observed. However, some fresh green shoots were observed among larger groups of plugs.
	  ○ No stressed plugs were observed, but the plugs generally showed signs of frequent inundation.
	  ○ Consistent with the July and October 2019 observations, approximately 2 to 3 inches of siltation was observed over a small area of GroSoxx (approximately 2 SF) to the west of Outfall A. The GroSoxx in this area are completely covered by silt.
	  ○ No invasive species were observed at the time of inspection.
	• Depth to sediment surface measurements taken at 7 reference fenceposts indicate an average increase in sediment erosion of 0.01 inch (with losses up to 0.6 inches in some areas and gains up to 0.5 inches in others) has occurred since the October 2019 inspection.
	• Waterfowl exclusion measures appeared to be in good condition.
		10 to 15	• Continue monitoring erosional/depositional rates using reference posts during inspections.

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE B – HIGH MARSH	• Overall total vegetative coverage has decreased slightly relative to October 2019 from 50% to approximately 35%, with slightly higher coverage in areas where plugs are densely planted in clusters. This decrease is not unexpected given that the vegetation is still in its dormant stage.
	  ○ At least 12 uprooted plugs were observed during the inspection and were replanted. All replanted plugs were the species planted in September 2019. Wood indicated that they also replant plugs within the high marsh planting zone during their inspections.
	  ○ Plugs appear to be in generally good condition and are healthy. Since the vegetation is generally still dormant, few signs of emergent growth were observed. However, some fresh green shoots were observed, mostly in plugs located at higher elevations.
	  ○ Consistent with the October 2019 observations, an odor typically associated with an anoxic environment (e.g. bog, wetland, swamp, etc.) was noted when stepping on the GroSoxx on the area adjacent eastern side of Outfall A. In addition, very minimal vegetative growth was observed in the areas of GroSoxx located at the interface of the uplands transition area and high marsh zone, particularly in the portion of the BEP area near the outfalls. Observations about the condition of the GroSoxx, geogrid, and anchors were consistent with those made during the October 2019 inspection:
	  ▪ Several GroSoxx and empty GroSoxx sleeves were observed outside of the geogrid;
	  ▪ There were several areas where ripping/holes or loose geogrid were observed;
	  ▪ Several anchors (both the Gripple Rock and Terra-Lock™ Earth anchors) showed signs of significant uplift, though none were fully lifted out of the ground;
	  ▪ Significant shifting of GroSoxx underneath the geogrid, with the third row of GroSoxx (from the bottom) appearing to be mostly missing; and
	  ▪ Significant siltation observed over the GroSoxx located on the western side of Outfall A, with many of the GroSoxx being completely buried up to the drift line.
	  ○ Minimal invasive species were observed at the time of inspection. A few clusters of European mugwort (*Artemisia vulgaris*) remain in the central portion of the BEP area, just west of Outfall A.
	• A small amount of debris (e.g. vegetative waste, plastic, trash, consumables) was observed along the drift deposit line below the bottom row of GroSoxx, consistent with observations made in July and October 2019.
	• Consistent with the July and October 2019 observations, coarse-grained material (sand, gravel, and cobbles) was observed on the surface of the shoreline fill material.
	• Waterfowl exclusion measures appear to be in good condition.
		14 to 21	• Continue monitoring erosional/depositional rates using reference posts during inspections.
			• Immediate repair of the damaged GroSoxx area with very minimal vegetative growth (particularly in the central and western portions of the BEP area near the outfalls). The repair should include replanting of plugs.

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE C – UPLANDS TRANSITION AREA	• Vegetative cover observations are generally consistent with those of the October 2019 inspection. Overall total vegetative coverage in the portion of the BEP area east of Outfall C is generally 85%. Overall total vegetative coverage west of Outfall C (i.e., in the central and western portions of the BEP area) also remains around 85%. However, coverage in some areas (in particular, between Outfalls A and B) remains only around 40-60%.
	  ○ Many of the emergent shoots of vegetation previously observed have become much more established.
	  ○ It does not appear that any additional loss of plugs has occurred and approximately 90% of the planted plugs are still present and growing within the upland transition area.
	  ○ GroSoxx, geogrid, anchors, and the ¾-inch stone strip appear to be in good condition, despite the conditions observed in the High Marsh Planting Zone.
	• Several invasive species were observed at the time of inspection, including crown vetch (*Securigera varia*), burdock (*Arctium minus*), common reed (*Phragmites australis*), and common mugwort (*Artemisia vulgaris*).
	  ○ Significantly more invasive species were observed in the western portion of the BEP area.
	  ○ Approximately 20 to 30% of vegetative growth in the area west of Outfall A consists of invasive species, specifically crown vetch. Crown vetch was also observed in the central portion of the BEP area between Outfalls A and B, though less frequently than in the western portion of the BEP area.
	  ○ Relatively few invasive species were observed in the northern portion of the BEP area bordering Cap 16; however, the species observed included burdock, phragmites, and common mugwort.
	• There was evidence of tidal drift deposits lining the lower extent of the GroSoxx, at the boundary with the high marsh zone, consistent with observations made in July and October 2019.
	• Waterfowl exclusion measures appear to be in good condition.
		18 to 23	• Complete planting of additional plugs in the portion of the BEP area between Outfalls A and B planned for the spring of 2020 to facilitate accelerated coverage.
			• Consider either mechanical (i.e. hand pulling) removal of invasive species or herbicide application to control spread.

SITE INSPECTION LOG (CONTINUED)

Photo 1: Northern end of Cap Area 16. Note healthy dormant vegetation, exposed sand and gravel, shoreline stabilization berm, and intact waterfowl exclusion measures (facing southwest).

Photo 2: Western end of Cap Area 16. Note healthy dormant vegetation in all three zones and limited debris along drift deposit line (facing west). Also note the damaged GroSoxx area with very minimal vegetative growth along the toe of the slope.

SITE INSPECTION LOG (CONTINUED)

Photo 3: Central and northern portions of the BEP. Note healthy dormant vegetation in the low marsh and upland transition zones, damaged GroSoxx area with minimal vegetative growth, shoreline stabilization berm, and limited debris along drift deposit line (facing northeast).

Photo 4: Western portion of BEP. Note healthy dormant vegetation in all three zones and exposed sand and gravel in the high marsh zone along the drift deposit line (facing east).

SITE INSPECTION LOG (CONTINUED)

Photo 5: Shoreline stabilization berm in western and northern portions of BEP (facing east).

Photo 6: Shoreline stabilization berm in western portion of BEP (facing northwest)

SITE INSPECTION LOG (CONTINUED)

Photo 7: Outfall A riprap apron. Note the deposited shoreline fill along the western edge of Outfall A (facing north).

Photo 8: Areas of shoreline fill material deposition in the vicinity of Outfall B (facing south).

SITE INSPECTION LOG (CONTINUED)

Photo 9: Areas of shoreline fill material deposition in the vicinity of Outfall C (facing southeast).

Photo 10: Healthy dormant vegetation in the low marsh zone of the northern portion of the BEP (viewing northeast).

SITE INSPECTION LOG (CONTINUED)

Photo 11: Healthy dormant vegetation in the low marsh zone between Outfalls A and B (viewing east).

Photo 12: Healthy dormant vegetation in the low marsh zone west of Outfall A (viewing east).

SITE INSPECTION LOG (CONTINUED)

Photo 13: Healthy dormant vegetation in the low marsh zone of the western portion of the BEP (viewing northwest).

Photo 14: Healthy, dormant vegetation in the low and high marsh zones of the western portion of the BEP (viewing east). Note exposed sand, gravel, and cobbles in the high marsh zone.

SITE INSPECTION LOG (CONTINUED)

Photo 15: Healthy, dormant vegetation in the low and high marsh zones of the central portion of the BEP (viewing west). Note the damaged GroSoxx area with very minimal vegetative growth along the toe of the slope.

Photo 16: Healthy, dormant vegetation in the high marsh zone of the northern portion of the BEP (viewing southwest).

SITE INSPECTION LOG (CONTINUED)

Photo 17: Sparsely vegetated high marsh zone, east of Outfall C (facing south). Note the damaged GroSoxx area with very minimal vegetative growth along the toe of the slope.

Photo 18: Sparsely vegetated upland transition area and high marsh zone between Outfalls A and B (facing south). Note the damaged GroSoxx area with very minimal vegetative growth along the toe of the slope.

SITE INSPECTION LOG (CONTINUED)

Photo 19: Uplifted anchor bolts and missing GroSoxx observed east of Outfalls B and C.

Photo 20: Moderately vegetated upland transition area and high marsh zone east of Outfall A (facing east).

SITE INSPECTION LOG (CONTINUED)

Photo 21: Moderately vegetated upland transition area and high marsh zone west of Outfall A (facing west).

Photo 22: Invasive species (crown vetch) observed in the upland transition area west of Outfall A.

SITE INSPECTION LOG (CONTINUED)

Photo 23: Upland transition area east of Outfall C with healthy dormant vegetation (facing south).

Photo 24: Exposed Cap Area 22 at time of inspection (facing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 25: Central portion of Cap Area 22 (facing west).

Photo 26: Central portion of Cap Area 22 (facing west).

ATTACHMENT A.2
AUGUST 19, 2020 INSPECTION LOG

SITE INSPECTION LOG

PROJECT NAME:	SA-7 Long-Term Monitoring Year 7	INSPECTION DATE:	August 19, 2020
		WEATHER	SNOWY ☐ RAINY ☐ OVERCAST ☒
PROJECT NUMBER:	1690000484	CONDITIONS:	PARTLY CLOUDY ☒ SUNNY ☐
PROJECT LOCATION:	SA-7 Droyers Cove BEP	TEMPERATURE (°F):	75 °F
	City of Jersey City, Hudson County, NJ	PREVAILING WIND:	5-8 mph (S to SW)
INSPECTOR NAME:	Owen Zalme/Lauren Iacobucci	INSPECTOR	
INSPECTOR TITLE:	Senior Consultant/Consultant	SIGNATURE(s):	

The inspection was conducted at low tide, when Cap Area 16 and the entire BEP area (including the shoreline stabilization berm) were fully exposed. Cap Area 22 was not exposed at the time of inspection, which spanned through the predicted low tide at 3:44 pm (i.e., low tide was not low enough to expose the cap surface). Since the last inspection (April 6, 2020), approximately 4,000 new wetland grass plugs were planted at approximately 1.5- to 2-foot (ft) spacings over the high and low marsh BEP areas by Florence Landscaping Services (Florence) under the oversight of Wood PLC. Specifically, about 2,000 plugs of *Spartina Patens* plugs were planted at 18 to 20-inch intervals throughout the high marsh and the very upper portion of the low marsh in May 2020 and about 2,000 plugs of *Spartina Alterniflora* planted throughout the upper two thirds of the low marsh area in June 2020. In addition, two rows of 1 ft by 2 ft RockSoxx were installed along the interface of the upland transition area and high marsh zone in the central portion of the BEP area, from just north of Outfall C to the eastern edge of Outfall A. **Figure 1** presents the location of the as-built BEP and cap areas described in the tables that follow.

TABLE 1. SEDIMENT CAP AREA INSPECTION LOG

CAP AREA	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED
16	• Long-term monitoring plate was not observed (i.e., plate remains buried). • Depth to sediment surface measurements taken at five reference posts indicate an average increase in sediment deposition of 0.2 inches throughout the cap area (with losses of up to 0.4 inches in some areas and gains of up to 0.8 inches in others) since the April 6, 2020 inspection. ○ Note that the CO-required thickness for this area is 12 inches and thickness verification measurements of the shoreline fill portion of the area during construction range from 25 to 40.8 inches. Even considering maximum cumulative erosion measured (2.8 inches since July 2019) and minimum thickness, the existing thickness would be at least 22.2inches.	1 to 4	• None
22	• Cap area was not exposed during period of inspection.	None	• None

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG			
BEP AREA ELEMENT	**OBSERVATIONS**	**PHOTO(S) TAKEN**	**CORRECTIVE ACTION(S) REQUIRED**
SHORELINE STABILIZATION	• Shoreline stabilization appears to be in good condition.	1, 2, 5, 6	• None
OUTFALL RIPRAP APRONS	• Outfall A: Consistent with the April 2020 observations, no scouring was observed and no water was observed bypassing the riprap on the west side of the outfall, where scouring had been observed before the October 2019 repairs to the edge of rip-rap apron. On the surface of the western portion of the riprap apron, areas of 6 to 12 inches of siltation were observed, with greater siltation in the upland portion than in the low marsh zone. • Outfalls B and C: Consistent with the April 2020 observations, no new scouring was observed and no water was observed bypassing the riprap on the west side of Outfall B, where scouring had been observed before the October 2019 repairs to the edge of rip-rap apron. Approximately 2 to 3 inches of siltation (likely displaced shoreline fill) were observed throughout the riprap apron, especially in the vicinity of both outfalls. Approximately 3 inches of siltation was observed along the western edge of the Outfall B riprap apron. • Outfall D: Extension piping appears to be in good condition.	7 to 10	• None

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE A – LOW MARSH	• Overall total vegetative coverage remains approximately the same relative to April 2020, estimated around 20%. Vegetative coverage is significantly greater (approximately 40-50%) in the sectors west of Outfall A and significantly less in the central and eastern sectors (10% or less). Vegetative coverage in the upper portion of the low marsh zone has improved (in part due to the additional plantings in May and June 2020). Vegetative coverage and plug condition have declined in the lower portion of the lower marsh zone.
	  ○ Some evidence of buried plugs was observed, particularly in lower elevation areas. Plug condition generally varies based on elevation:
	  ▪ In the central and eastern portions of the BEP area, which are lower in elevation, plugs are present but in poor condition and visibly stressed. Plugs in these areas were observed to have stunted growth (only 2 to 3 inches in height) and were covered in sediment and algae.
	  ▪ In the western portion of the BEP area, plugs are more vibrant and generally in good condition, with growth up to approximately 6 to 8 inches.
	  ○ Consistent with the April 2020 observations, approximately 2 to 3 inches of siltation was observed over a small area of GroSoxx (approximately 2 SF) to the west of Outfall A. The GroSoxx in this area are completely covered by silt.
	  ○ No invasive species were observed at the time of inspection.
	• Depth to sediment surface measurements taken at 7 reference posts indicate that an average increase in sediment deposition of 0.6 inches (with losses of up to 0.4 inches in some areas and gains of up to 2.5 inches in others) has occurred since the April 2020 inspection.
	  ○ This increase in deposition is visually evident throughout the low marsh zone, particularly in the western portion of the BEP area, where the elevation of fill along the slope is approximately level with that of the shoreline stabilization.
	• Waterfowl exclusion measures appear to be in good condition.
		10 to 18	• Continue monitoring erosional/depositional rates using reference posts during inspections.

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE B – HIGH MARSH	• Overall total vegetative coverage has increased relative to April 2020 from 35% to approximately 50%, with slightly higher coverage in areas where plugs are densely planted in clusters and slightly lower coverage in the central portion of the BEP area, between Outfalls A and B. Though initial plantings were observed in good condition and growing, this increase can also be partly attributed to the new plantings in May 2020.
	  ○ No uprooted plugs were observed during the inspection.
	  ○ Plugs appear to be in generally good condition and are healthy, measuring between 2 and 4 feet tall, with taller plugs generally present in clusters.
	  ○ Consistent with the April 2020 observations, an odor typically associated with an anoxic environment (e.g. bog, wetland, swamp, etc.) was noted when stepping on the GroSoxx on the central portion of the BEP area, east of Outfall A. In addition, very minimal vegetative growth was observed in the areas of GroSoxx located at the interface of the uplands transition area and high marsh zone, particularly in the portion of the BEP area near the outfalls. Observations about the condition of the GroSoxx, geogrid, and anchors were consistent with those made during the April 2020 inspection:
	  ▪ Several GroSoxx and empty GroSoxx sleeves were observed outside of the geogrid;
	  ▪ There are several areas where ripping/holes or loose geogrid were observed;
	  ▪ Several anchors (both the Gripple Rock and Terra-Lock™ Earth anchors) show signs of significant uplift (possibly due to the deflation of the GroSoxx), though none have been fully lifted out of the ground;
	  ▪ Significant shifting of GroSoxx underneath the geogrid has occurred, and the third row of GroSoxx (from the bottom) appears to be mostly missing; and
	  ▪ Significant siltation was observed over the GroSoxx located on the western side of Outfall A, with many of the GroSoxx completely buried up to the drift line.
	  ○ RockSoxx have been installed along the interface of the upland transition area and high marsh zone in the central portion of the BEP area, between Outfalls A and B, and just north of Outfall C:
	  ▪ Some of the RockSoxx show signs of wear and tear, with holes on the surface that could potentially result in loss of the material within.
	  ▪ Large cuts/openings were observed in several RockSoxx in the central portion of the BEP area.
	  ○ No invasive species were observed at the time of inspection.
	• A small amount of debris (e.g. vegetative waste, plastic, trash, consumables) was observed along the drift deposit line below the bottom row of GroSoxx, consistent with observations made April 2020.
	• Consistent with the April 2020 observations, coarse-grained material (sand, gravel, and cobbles) was observed on the surface of the shoreline fill material.
	• Waterfowl exclusion measures appear to be in good condition.
		19 to 27	• Continue monitoring erosional/depositional rates using reference posts during inspections.
			• Immediately repair or replace the damaged RockSoxx located in the central portion of the BEP area between Outfalls A and B.
			• Consider planting plugs in the areas with exposed geogrid, where soil has filled in over previously installed GroSoxx.
			• Consider implementing options to repair the High Marsh area (generally within the drift line) where vegetation is not successfully establishing and the GroSoxx appear to be saturated and in some cases "emptying out",

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED
PLANTING ZONE C – UPLANDS TRANSITION AREA	• Overall vegetative coverage has increased relative to the April 2020 inspection to approximately 85-95% throughout the BEP area. This growth is solely due to initial plantings, as no new plugs were planted in this area b in May or June 2020. Consistent with the April 2020 observations: ○ Many of the emergent shoots of vegetation previously observed have become much more established. ○ It does not appear that any additional loss of plugs has occurred and approximately 90% of the planted plugs are still present and growing within the upland transition area. ○ GroSoxx, geogrid, anchors, and the ¾-inch stone strip appear to be in good condition, despite the conditions observed in the High Marsh Planting Zone. • Invasive species coverage has generally decreased relative to April 2020, from 20-30% in the area west of Outfall A to less than 3% overall. Overall, a predominantly native community has been established, with the following species of note: ○ Swamp milkweed (Asclepias incarnata) ○ Partridge pea (Chamaecrista fasciculata) ○ Creeping saltbush (Atriplex prostrata) ○ Deer tongue (Dichanthelium clandestinum) ○ Black-eyed Susan (Rudbeckia hirta) ○ New York iron weed (Vernonia noveboracensis); and ○ Lady's thumbprint (Persicaria maculosa) • Consistent with observations made in April 2020, evidence of tidal drift deposits was observed lining the lower extent of the GroSoxx, at the boundary with the high marsh zone. • Waterfowl exclusion measures appear to be in good condition, with the exception of one pole in the area west of Outfall A that requires re-installation (see Photo 33).	28 to 33	• Reinstall pole for waterfowl exclusion measures.

LEGEND

- EXISTING TOPOGRAPHIC AND BATHYMETRIC CONTOUR
- MEAN HIGH WATER LINE (3.52 FT)
- UPLANDS TRANSITION AREA (ABOVE 5.00 FT)
- BEP FILL AREA (THICKNESS VARIES)
- GROSOXX AREA (18 IN THICK)
- RIPRAP AREA
- STONE BERM
- SEED AREA
- GRAVEL AREA
- CAPPING AREA LIMIT
- ZONE A LOW MARSH (BELOW 3.52 FT.)
- ZONE B HIGH MARSH (3.52 FT. TO 5.00 FT.)
- ZONE C UPLANDS TRANSITION AREA (ABOVE 5.00 FT.)

22a
22b
22
16
HACKENSACK RIVER
WOOD-TONIC BULKHEAD
OUTFALL A
OUTFALL B
OUTFALL C
OUTFALL D
DECKS
SHADOWS
G/O LINE
GATE
POWER LINE

DRAFT

0 50
SCALE IN FEET

AS-BUILT BEP AND CAP AREAS

HONEYWELL SA-7
BENEFICIAL ENVIRONMENTAL PROJECT
CITY OF JERSEY CITY
HUDSON COUNTY, NEW JERSEY

RAMBOLL

FIGURE
1

DRAFTED BY: BSC/MSB | DATE: 09/04/2020 | PROJECT: 1690009685

MBLEI 9/4/20 F:\1690009685_DROYERS-COVE_BEP AS-BUILTS < AS-BUILT PLAN_FIGURE >

SITE INSPECTION LOG (CONTINUED)

Photo 1: Northern end of Cap Area 16. Note healthy vegetation and intact waterfowl exclusion measures (facing southwest).

Photo 2: Western end of Cap Area 16. Note healthy vegetation and intact waterfowl exclusion measures (facing southwest).

SITE INSPECTION LOG (CONTINUED)

Photo 3: Central portion of the BEP. Note healthy vegetation in the high marsh and upland transition zones, damaged GroSoxx area with minimal vegetative growth, shoreline stabilization berm, and limited debris along drift deposit line (facing east).

Photo 4: Western portion of BEP. Note healthy vegetation in all three zones and exposed sand and gravel in the high marsh zone along the drift deposit line (facing southeast).

SITE INSPECTION LOG (CONTINUED)

Photo 5: Shoreline stabilization berm in western and northern portions of BEP (facing northeast).

Photo 6: Shoreline stabilization berm in western portion of BEP (facing northwest)

SITE INSPECTION LOG (CONTINUED)

Photo 7: Outfall A riprap apron. Note the deposited shoreline fill along the western edge of Outfall A (facing north).

Photo 8: Outfall B discharge area (facing south).

SITE INSPECTION LOG (CONTINUED)

Photo 9: Outfall C discharge area (facing southeast).

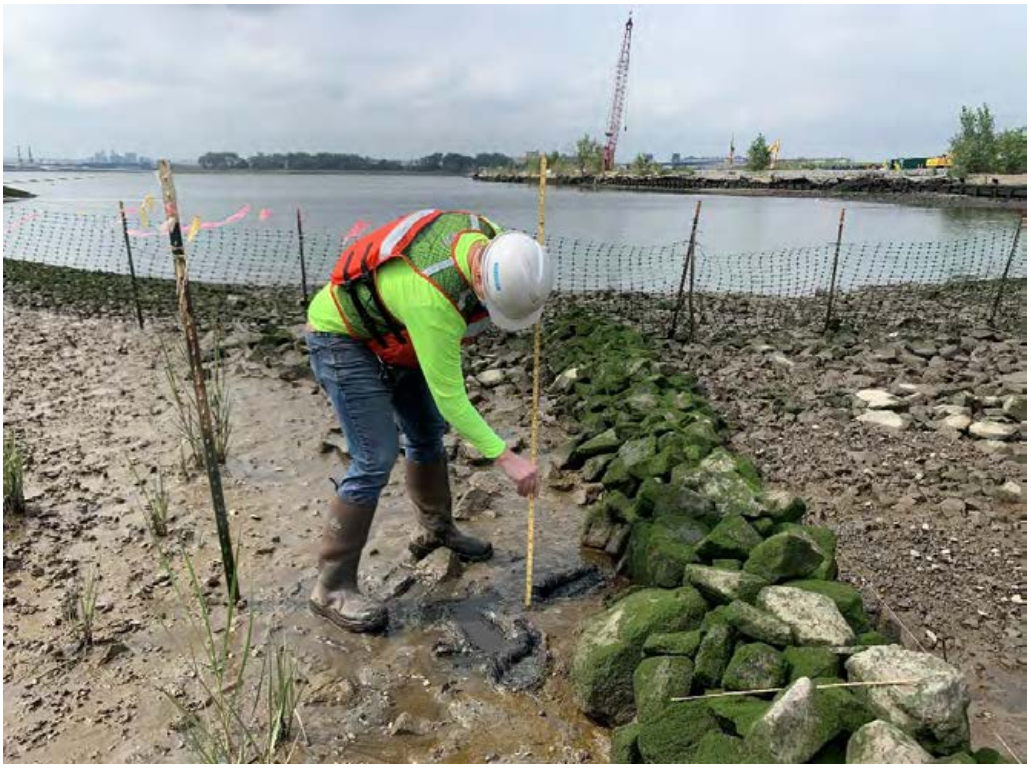


Photo 10: Measuring depth of siltation along western edge of Outfall B riprap apron (viewing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 11: Low marsh zone of the northern portion of the BEP with sparse and stressed vegetation (viewing northeast).

Photo 12: Sparse and stressed vegetation in the low marsh zone of the northern portion of the BEP (viewing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 13: Vegetation covered with sediment and algae, stunted in growth, in the low marsh zone of the northern portion of the BEP.

Photo 14: Sparse and stressed vegetation in the low marsh zone between Outfalls A and B (viewing east).

SITE INSPECTION LOG (CONTINUED)

Photo 15: Sparse vegetation in the low marsh zone of the western portion of the BEP adjacent to Outfall A (viewing southeast).

Photo 16: Healthy, vibrant vegetation in the low marsh zone of the western portion of the BEP (viewing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 17: Sediment deposition near the shoreline stabilization berm in the low marsh zone west of Outfall A (viewing east).

Photo 18: Sediment deposition in the low marsh zone near the shoreline stabilization berm west of Outfall A (viewing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 19: Healthy, vibrant vegetation in the high marsh zone of the northern portion of the BEP area (viewing southwest).

Photo 20: Healthy, vibrant vegetation in the high marsh zone of the central portion of the BEP area, between Outfalls A and B (viewing southwest).

SITE INSPECTION LOG (CONTINUED)

Photo 21: Healthy, vibrant vegetation in the high marsh zone of the western portion of the BEP area (viewing northwest).

Photo 22: Sediment deposition over GroSoxx in the high marsh zone of the western portion of the BEP area, directly west of Outfall A (viewing southeast).

SITE INSPECTION LOG (CONTINUED)

Photo 23: Damaged GroSoxx area with minimal growth in the high marsh zone north of Outfall C (viewing southeast). Note the installed RockSoxx directly below the line of vegetation.

Photo 24: Accumulated sediment visible beneath the geogrid in the damaged GroSoxx area north of Outfall C.

SITE INSPECTION LOG (CONTINUED)

Photo 25: RockSoxx installed along the interface between the high marsh zone and upland transition zone in the central portion of the BEP area, between Outfalls A and B (viewing east).

Photo 26: Wear and tear on surface of RockSoxx in the central portion of the BEP area, between Outfalls A and B.

SITE INSPECTION LOG (CONTINUED)

Photo 27: Damaged RockSoxx in the central portion of the BEP area, between Outfalls A and B.

Photo 28: Healthy, vibrant vegetation in the upland transition area of the northern portion of the BEP area (viewing southwest).

SITE INSPECTION LOG (CONTINUED)

Photo 29: Healthy, vibrant vegetation in the upland transition area of the central portion of the BEP area (viewing east).

Photo 30: Healthy, vibrant vegetation in the high marsh and upland transition areas of the western portion of the BEP area (viewing east). Note debris along the drift line between the two zones.

SITE INSPECTION LOG (CONTINUED)

Photo 31: Creeping saltbush observed in the upland transition area of the central portion of the BEP area.

Photo 32: Swamp milkweed observed in the upland transition area of the central portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 33: Waterfowl exclusion pole requiring reinstallation.

ATTACHMENT A.3
OCTOBER 15, 2020 INSPECTION LOG

SITE INSPECTION LOG

PROJECT NAME:	SA-7 Long-Term Monitoring Year 7	INSPECTION DATE:	October 15, 2020
		WEATHER	SNOWY ☐ RAINY ☐ OVERCAST ☐
PROJECT NUMBER:	1690000484	CONDITIONS:	PARTLY CLOUDY ☒ SUNNY ☐
PROJECT LOCATION:	SA-7 Droyers Cove BEP	TEMPERATURE (°F):	76 °F
	City of Jersey City, Hudson County, NJ	PREVAILING WIND:	10-20 mph (SSW)
INSPECTOR NAME:	Lauren Iacobucci/June Yeung	INSPECTOR	
INSPECTOR TITLE:	Consultant/Senior Consultant	SIGNATURE(s):	

The inspection was conducted at low tide, when Cap Area 16 and the entire BEP area (including the shoreline stabilization berm) were fully exposed. Cap Area 22 was not exposed at the time of inspection, which spanned through the predicted low tide at 2:14 pm (i.e., low tide was not low enough to expose the cap surface). **Figure 1** presents the location of the as-built BEP and cap areas described in the tables that follow.

TABLE 1. SEDIMENT CAP AREA INSPECTION LOG

CAP AREA	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED
16	• Long-term monitoring plate was not observed (i.e., plate remains buried). • Depth to sediment surface measurements taken at five reference posts indicate an average increase in sediment deposition of 0.1 inches throughout the cap area (with losses of up to 0.5 inches in some areas and gains of up to 0.4 inches in others) since the August 19, 2020 inspection. ○ Note that the CO-required thickness for this area is 12 inches and thickness verification measurements of the shoreline fill portion of the area during construction range from 25 to 40.8 inches. Even considering maximum cumulative erosion measured (3.3 inches since July 2019) and minimum thickness, the existing thickness would be at least 21.7 inches.	1 to 3	• None
22	• Cap area was not exposed during period of inspection.	None	• None

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG			
BEP AREA ELEMENT	**OBSERVATIONS**	**PHOTO(S) TAKEN**	**CORRECTIVE ACTION(S) REQUIRED**
SHORELINE STABILIZATION	• Shoreline stabilization appears to be in good condition.	3 to 7	• None
OUTFALL RIPRAP APRONS	• Outfall A: Consistent with the August 2020 observations, areas of 6 to 12 inches of siltation were observed on the surface of the western portion of the riprap apron, with greater siltation in the upland portion than in the low marsh zone. • Outfalls B and C: Consistent with the August 2020 observations, approximately 2 to 3 inches of siltation (likely displaced shoreline fill) were observed throughout the riprap apron, especially in the vicinity of both outfalls. Approximately 3 to 4 inches of siltation was observed along the western edge of the Outfall B riprap apron. • Outfall D: Extension piping appears to be in good condition.	8 to 12	• None
PLANTING ZONE A – LOW MARSH	• Overall total vegetative coverage remains approximately the same or slightly improved relative to August 2020, estimated around 25%. Consistent with the August 2020 observations, vegetative coverage is significantly greater (approximately 40-50%) in the sectors west of Outfall A and significantly less in the central and eastern sectors (10% or less). Vegetative coverage and plug conditions continue to be better in the upper portion of the low marsh zone compared to conditions in the lower portion of the low marsh zone. ○ Some evidence of buried plugs was observed, particularly in lower elevation areas. Plug condition generally varies based on elevation: ▪ In the central and eastern portions of the BEP area, which are lower in elevation, very few plugs are present. Those that are present are in poor condition and visibly stressed. Plugs in these areas were observed to have stunted growth (only 2 to 3 inches in height) and were covered in sediment and algae. ▪ In the western portion of the BEP area, plugs are more vibrant and generally in good condition, with growth up to approximately 6 feet. ○ Consistent with the August 2020 observations, approximately 2 to 3 inches of siltation was observed over a small area of GroSoxx (approximately 2 SF) to the west of Outfall A. The GroSoxx in this area are completely covered by silt. ○ No invasive species were observed at the time of inspection. • Depth to sediment surface measurements taken at 7 reference posts indicate that an average increase in sediment erosion of 0.3 inches (with losses of up to 1.0 inches in some areas and gains of up to 3.0 inches in others) has occurred since the August 2020 inspection. • Waterfowl exclusion measures appear to be in generally good condition. However, evidence of waterfowl activity (i.e. geese footprints and excrement) was observed in the lower portion of the low marsh zone northeast of Outfall C, indicating ineffective exclusion measures in this area.	13 to 23	• Continue monitoring erosional/depositional rates using reference posts during inspections. • Improve waterfowl exclusion measures in the low marsh zone northeast of Outfall C.

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE B – HIGH MARSH	• Overall total vegetative coverage remains approximately the same relative to August 2020, estimated around 50%, with slightly higher coverage in areas where plugs are densely planted in clusters and slightly lower coverage in the central portion of the BEP area, between Outfalls A and B.
	  ○ No uprooted plugs were observed during the inspection.
	  ○ Plugs appear to be in generally good condition and are healthy, measuring between 2 and 5 feet tall, with taller plugs generally present in clusters.
	  ○ Consistent with observations since October 2019, an odor typically associated with an anoxic environment (e.g. bog, wetland, swamp, etc.) was noted when stepping on the GroSoxx on the central portion of the BEP area, east of Outfall A. In addition, very minimal vegetative growth was observed in the areas of GroSoxx located at the interface of the uplands transition area and high marsh zone, particularly near the outfalls. Observations about the condition of the GroSoxx, geogrid, and anchors were consistent with those made since October 2019:
	  ▪ Empty GroSoxx sleeves were observed outside of the geogrid;
	  ▪ There are several areas where ripping/holes or loose geogrid were observed;
	  ▪ Several anchors (both the Gripple Rock and Terra-Lock™ Earth anchors) show signs of significant uplift (possibly due to the deflation of the GroSoxx), though none have been fully lifted out of the ground;
	  ▪ Significant shifting of GroSoxx underneath the geogrid has occurred, and the third row of GroSoxx (from the bottom) appears to be mostly missing; and
	  ▪ Significant siltation was observed over the GroSoxx located on the western side of Outfall A, with many of the GroSoxx completely buried up to the drift line.
	  ○ Observations about the condition of the RockSoxx installed along the interface of the upland transition area and high marsh zone in the central portion of the BEP area (between Outfalls A and B, and just north of Outfall C) were consistent with those made during the August 2020 inspection:
	  ▪ Some of the RockSoxx show signs of wear and tear, with holes on the surface that could potentially result in loss of the material within.
	  ▪ Large cuts/openings were observed in several RockSoxx in the central portion of the BEP area.
	  ○ No invasive species were observed at the time of inspection.
	• A small amount of debris (e.g. vegetative waste, plastic, trash, consumables) was observed along the drift deposit line below the bottom row of GroSoxx, consistent with observations made in August 2020.
	• Consistent with the August 2020 observations, coarse-grained material (sand, gravel, and cobbles) was observed on the surface of the shoreline fill material.
	• Waterfowl exclusion measures appear to be in good condition.
		23 to 34	• Continue monitoring erosional/depositional rates using reference posts during inspections.
			• Repair or replace the damaged RockSoxx located in the central portion of the BEP area between Outfalls A and B.
			• Consider planting plugs in the areas with exposed geogrid, where soil has filled in over previously installed GroSoxx.
			• Consider implementing options to repair the high marsh zone (generally within the drift line) where vegetation is not successfully establishing and the GroSoxx appear to be saturated and in some cases "emptying out".

SITE INSPECTION LOG (CONTINUED)

TABLE 2. BENEFICIAL ENVIRONMENTAL PROJECT AREA INSPECTION LOG

BEP AREA ELEMENT	OBSERVATIONS	PHOTO(S) TAKEN	CORRECTIVE ACTION(S) REQUIRED

PLANTING ZONE C – UPLANDS TRANSITION AREA	• Overall vegetative coverage remains approximately the same relative to August 2020, estimated around 85-95% throughout the BEP area. Consistent with the August 2020 observations:
	  ○ Many of the emergent shoots of vegetation previously observed have become much more established.
	  ○ It does not appear that any additional loss of plugs has occurred and approximately 90% of the planted plugs are still present and growing within the upland transition area.
	  ○ GroSoxx, geogrid, anchors, and the ¾-inch stone strip appear to be in good condition, despite the conditions observed in the high marsh zone.
	• Invasive species coverage is generally consistent with observations made in August 2020, estimated around 5% overall. Observed invasive species include a white mulberry tree (Morus alba) growing in the central portion of the BEP area and a small cluster of common reed (Phragmites australis) approximately 3 feet in diameter located in the area northeast of Outfall C.
	• A predominantly native community has been established, with the following species of note:
	  ○ White heath aster (Symphyotrichum ericoides)
	  ○ Canada goldenrod (Solidago canadensis)
	  ○ Maryland senna (Senna marilandica)
	  ○ Aromatic aster (Symphyotrichum oblongifolium)
	  ○ Swamp milkweed (Asclepias incarnata)
	  ○ Partridge pea (Chamaecrista fasciculata)
	  ○ Creeping saltbush (Atriplex prostrata)
	  ○ Deer tongue (Dichanthelium clandestinum)
	  ○ Black-eyed Susan (Rudbeckia hirta)
	  ○ New York iron weed (Vernonia noveboracensis); and
	  ○ Lady's thumbprint (Persicaria maculosa)
	• Consistent with observations made in August 2020, evidence of tidal drift deposits was observed lining the lower extent of the GroSoxx, at the boundary with the high marsh zone.
	• Waterfowl exclusion measures appear to be in good condition, with the exception of one pole in the area west of Outfall A that requires re-installation (see Photo 48).
		35 to 46	• Reinstall pole for waterfowl exclusion measures.

SITE INSPECTION LOG (CONTINUED)

Photo 1: Northern end of Cap Area 16. Note healthy vegetation and intact waterfowl exclusion measures (viewing southwest).

Photo 2: Western end of Cap Area 16. Note healthy vegetation and intact waterfowl exclusion measures (viewing northeast).

SITE INSPECTION LOG (CONTINUED)

Photo 3: Cap Area 16 and shoreline stabilization berm viewed from SA-6S bulkhead (viewing southeast).

Photo 4: Shoreline stabilization berm in northeastern portion of BEP area (viewing west).

SITE INSPECTION LOG (CONTINUED)

Photo 5: Shoreline stabilization berm in central portion of BEP area (viewing east).

Photo 6: Shoreline stabilization berm in western portion of BEP area (viewing west)

SITE INSPECTION LOG (CONTINUED)

Photo 7: Shoreline stabilization berm west of BEP area (viewing southwest).

Photo 8: Outfall A riprap apron. Note the deposited shoreline fill along the western edge of Outfall A (viewing north).

SITE INSPECTION LOG (CONTINUED)

Photo 9: Outfalls B and C riprap apron (viewing west).

Photo 10: Outfall B discharge area (viewing south).

SITE INSPECTION LOG (CONTINUED)

Photo 11: Outfall C discharge area (viewing southeast).

Photo 12: Siltation along outer western edge of Outfall B riprap apron (viewing northeast).

SITE INSPECTION LOG (CONTINUED)

Photo 13: Healthy, vibrant vegetation in the low marsh zone in the northeastern corner of the BEP area (viewing southwest).

Photo 14: Low marsh zone of the northern portion of the BEP area with sparse and stressed vegetation (viewing northeast). Note traces of waterfowl activity (i.e. excrement, footprints).

SITE INSPECTION LOG (CONTINUED)

Photo 15: Sparse and stressed vegetation in the low marsh zone of the northern portion of the BEP area (viewing northwest).

Photo 16: Evidence of waterfowl activity in the low marsh zone of the northern portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 17: Ineffective waterfowl exclusion measures in the low marsh zone of the northern portion of the BEP area (viewing southwest).

Photo 18: Vegetation in the low marsh zone between Outfalls A and B (viewing east). Note the healthy and vibrant vegetation in the upper portion of the zone, and sparse and stressed vegetation in the lower portion of the zone.

SITE INSPECTION LOG (CONTINUED)

Photo 19: Healthy and vibrant vegetation in the upper portion of the low marsh zone between Outfalls A and B (viewing southeast).

Photo 20: Sparse vegetation in the lower portion of the low marsh zone in the western portion of the BEP area, adjacent to Outfall A (viewing southeast).

SITE INSPECTION LOG (CONTINUED)

Photo 21: Healthy, vibrant vegetation in the low marsh zone of the western portion of the BEP area (viewing northeast).

Photo 22: Healthy, vibrant vegetation in the low marsh zone of the western portion of the BEP area (viewing northeast).

SITE INSPECTION LOG (CONTINUED)

Photo 23: Healthy, vibrant vegetation in the low and high marsh zones of the western portion of the BEP area (viewing east).

Photo 24: Healthy vegetation in the high marsh zone of the northern portion of the BEP area (viewing northeast).

SITE INSPECTION LOG (CONTINUED)

Photo 25: Sparse vegetation and exposed geogrid in the high marsh zone of the northern portion of the BEP area adjacent to Outfall C (viewing northeast).

Photo 26: Exposed geogrid and sparse vegetation in the high marsh zone of the central portion of the BEP area, between Outfalls A and B (viewing west). Note RockSoxx installed along the interface between the high marsh zone and upland transition zone

SITE INSPECTION LOG (CONTINUED)

Photo 27: Exposed geogrid and sparse vegetation in the high marsh zone of the central portion of the BEP area, between Outfalls A and B (viewing east).

Photo 28: Sediment deposition over GroSoxx in the high marsh zone of the western portion of the BEP area, directly west of Outfall A (viewing northwest).

SITE INSPECTION LOG (CONTINUED)

Photo 29: Healthy vegetation in the high marsh zone of the northern portion of the BEP area (viewing east).

Photo 30: Damaged GroSoxx area with minimal growth in the high marsh zone east of Outfall C (viewing southeast). Note the installed RockSoxx directly below the line of vegetation.

SITE INSPECTION LOG (CONTINUED)

Photo 31: Damaged GroSoxx area with minimal growth in the high marsh zone east of Outfall A (viewing east).

Photo 32: Wear and tear on surface of RockSoxx in the central portion of the BEP area, between Outfalls A and B.

SITE INSPECTION LOG (CONTINUED)

Photo 33: Wear and tear on surface of RockSoxx in the central portion of the BEP area, between Outfalls A and B.

Photo 34: Damaged RockSoxx in the central portion of the BEP area, between Outfalls A and B.

SITE INSPECTION LOG (CONTINUED)

Photo 35: Healthy vegetation in the upland transition area of the northern portion of the BEP area (viewing southwest).

Photo 36: Healthy vegetation in the upland transition area of the central portion of the BEP area (viewing east).

SITE INSPECTION LOG (CONTINUED)

Photo 37: Healthy vibrant vegetation in the high marsh and upland transition areas of the western portion of the BEP area (viewing east).

Photo 38: Creeping saltbush observed in the upland transition area of the central portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 39: Aromatic aster observed in the upland transition area of the central portion of the BEP area.

Photo 40: Maryland senna observed in the upland transition area of the western portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 41: Black-eyed Susan and health aster observed in the upland transition area of the western portion of the BEP area.

Photo 42: Canada goldenrod observed at the interface of the high marsh and upland transition area of the western portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 43: Partridge pea observed at the interface of the high marsh and upland transition area of the western portion of the BEP area.

Photo 44: White mulberry tree observed in the upland transition zone of the western portion of the BEP area.

SITE INSPECTION LOG (CONTINUED)

Photo 45: Common reed observed in the upland transition zone of the northern portion of the BEP area.

Photo 46: Waterfowl exclusion pole requiring reinstallation.

ATTACHMENT B
YEAR 7 HYDRAULIC AND HYDRODYNAMIC EVALUATION SUMMARIES

ATTACHMENT B.1
Q1 2020 HYDRAULIC AND HYDRODYNAMIC EVALUATION SUMMARIES

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **January 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 0.88 Date: 1/25/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.836 Date: 1/25/2020 Time: 20:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.218 Date: 1/25/2020 Time: 14:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 38 Date: 1/16/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: WNW OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

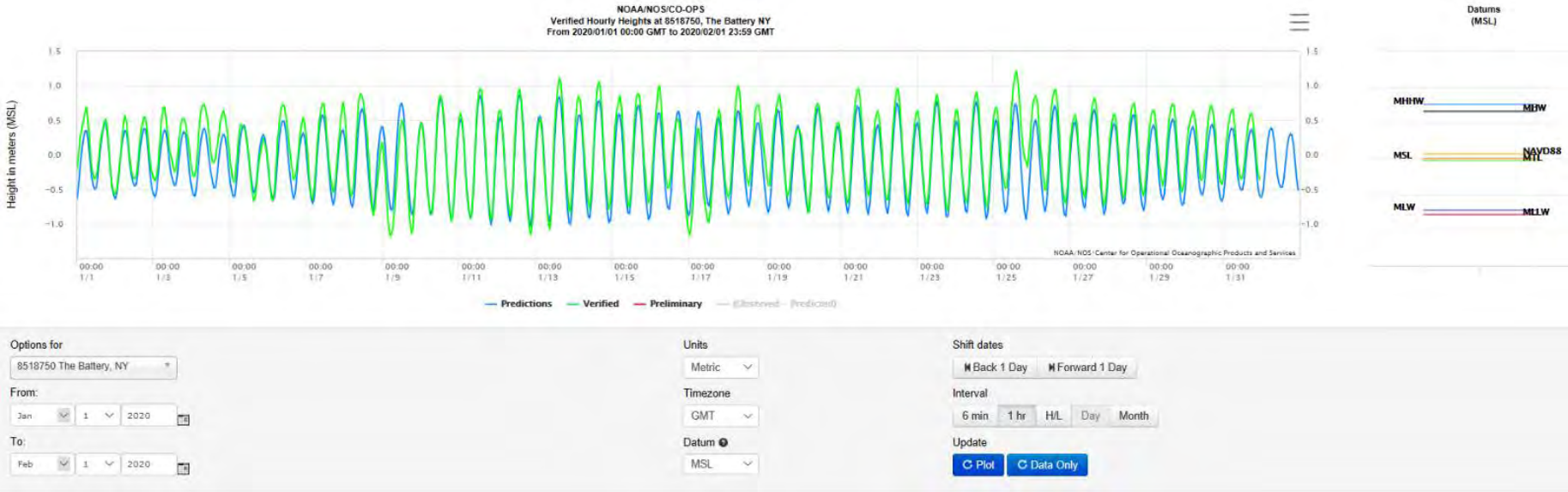
https://w2.weather.gov/climate/getclimate.php?wfo=okx

688
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: NEWARK NJ
MONTH: JANUARY
YEAR: 2020
LATITUDE: 40 42 N
LONGITUDE: 74 10 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	41	29	35	3	30	0	T	T	0	13.7	26	270	M	M	7		32	290
2	50	26	38	6	27	0	0.00	0.0	0	7.4	20	220	M	M	5		26	190
3	48	44	46	14	19	0	0.11	0.0	0	6.2	12	240	M	M	10	1	15	250
4	52	41	47	15	18	0	0.21	0.0	M	5.9	22	310	M	M	10	12	31	320
5	45	35	40	8	25	0	T	T	0	16.3	32	320	M	M	8		42	290
6	46	31	39	7	26	0	0.03	0.9	1	10.2	21	260	M	M	7	1	26	260
7	44	33	39	7	26	0	T	T	0	7.1	17	290	M	M	9		23	300
8	45	28	37	5	28	0	T	T	0	16.9	35	300	M	M	4		46	310
9	34	23	29	-3	36	0	0.00	0.0	0	8.4	29	320	M	M	5		35	310
10	55	30	43	11	22	0	0.00	0.0	0	8.6	21	230	M	M	9		25	230
11	70	48	59	28	6	0	0.00	0.0	0	12.3	30	200	M	M	9		40	200
12	69	44	57	26	8	0	0.04	0.0	0	19.6	37	270	M	M	7		48	270
13	46	35	41	10	24	0	T	0.0	0	6.4	16	20	M	M	9		20	20
14	46	36	41	10	24	0	0.02	0.0	0	4.5	8	10	M	M	10	1	M	M
15	53	41	47	16	18	0	0.00	0.0	0	6.9	16	290	M	M	6	18	20	320
16	50	34	42	11	23	0	0.05	T	0	16.7	38	310	M	M	7	1	51	290
17	34	21	28	-3	37	0	0.00	0.0	0	17.3	36	320	M	M	4		47	330
18	36	20	28	-3	37	0	0.31	1.8	0	7.9	23	240	M	M	10	146	26	240
19	45	28	37	6	28	0	T	0.0	T	14.9	28	320	M	M	7		35	320
20	33	21	27	-4	38	0	0.00	0.0	0	15.1	25	330	M	M	1		33	330
21	35	20	28	-3	37	0	0.00	0.0	0	8.8	16	320	M	M	3		25	300
22	41	22	32	1	33	0	0.00	0.0	0	3.9	10	310	M	M	2		13	300
23	47	24	36	4	29	0	0.00	0.0	0	3.3	9	250	M	M	8		12	230
24	52	32	42	10	23	0	0.00	0.0	0	4.7	12	70	M	M	7	8	15	100
25	52	39	46	14	19	0	0.88	0.0	0	11.3	28	100	M	M	9	1	42	90
26	48	34	41	9	24	0	0.00	0.0	0	10.7	23	280	M	M	4		29	270
27	47	32	40	8	25	0	0.00	0.0	0	12.0	20	330	M	M	8		25	330
28	45	37	41	9	24	0	0.00	0.0	0	14.7	24	320	M	M	9		31	320
29	42	27	35	3	30	0	0.00	0.0	0	13.0	23	330	M	M	5		30	320
30	37	23	30	-2	35	0	0.00	0.0	0	6.9	16	10	M	M	6		21	20
31	44	29	37	5	28	0	0.02	0.0	0	4.6	9	110	M	M	9	1	13	110
SM	1432	967		807	0	1.67		2.7	316.2				M		214			
AV	46.2	31.2								10.2	FASTST		M	M	7		MAX(MPH)	
							MISC ---->		# 38	310							# 51	290

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200101&edate=20200201&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **February 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 0.62 Date: 2/6/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.692 Date: 2/7/2020 Time: 17:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.245 Date: 2/7/2020 Time: 12:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 44 Date: 2/7/2020 Exceeds trigger criteria? YES Wind direction over 6-hr period: W OK Note: (1) The averaged wind speed for the 6-hour period during which the maximum wind speed was recorded does not exceed the threshold criteria.	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

688
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: NEWARK NJ
MONTH: FEBRUARY
YEAR: 2020
LATITUDE: 40 42 N
LONGITUDE: 74 10 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	44	36	40	8	25	0	T	0.0	0	4.3	9	300	M	M	10	18	13	300
2	44	35	40	8	25	0	0.09	T	0	8.1	22	260	M	M	9	1	27	240
3	58	35	47	15	18	0	0.00	0.0	0	6.2	21	270	M	M	7	1	26	280
4	59	41	50	17	15	0	T	0.0	0	4.6	13	10	M	M	10		16	10
5	53	40	47	14	18	0	0.02	0.0	0	10.1	25	350	M	M	10	1	32	350
6	42	36	39	6	26	0	0.62	0.0	0	6.9	14	90	M	M	10	1	20	110
7	60	33	47	14	18	0	0.28	0.0	0	15.5	44	260	M	M	9	128	54	270
8	43	29	36	3	29	0	T	T	0	11.9	26	280	M	M	4		33	280
9	46	28	37	3	28	0	0.00	0.0	0	6.9	13	180	M	M	7		16	200
10	47	41	44	10	21	0	0.35	0.0	0	9.5	21	230	M	M	10	1	25	220
11	50	44	47	13	18	0	0.29	0.0	0	5.8	20	310	M	M	9	1	31	290
12	47	36	42	8	23	0	0.19	T	0	10.0	24	310	M	M	9	14	33	310
13	44	36	40	6	25	0	0.27	0.0	0	5.5	21	310	M	M	10	1	31	310
14	40	18	29	-5	36	0	0.00	0.0	0	15.4	28	340	M	M	3		35	310
15	31	12	22	-13	43	0	0.00	0.0	0	8.5	16	200	M	M	4		22	190
16	46	28	37	2	28	0	0.00	0.0	0	6.1	15	240	M	M	9		18	200
17	53	34	44	9	21	0	0.00	0.0	0	5.0	14	50	M	M	7		21	320
18	49	39	44	9	21	0	T	0.0	0	7.1	15	10	M	M	10	18	21	90
19	50	32	41	6	24	0	0.00	0.0	0	13.4	28	320	M	M	6	18	34	320
20	37	25	31	-5	34	0	0.00	0.0	0	11.2	23	350	M	M	8		31	340
21	37	20	29	-7	36	0	0.00	0.0	0	11.3	22	360	M	M	1		27	350
22	51	24	38	2	27	0	0.00	0.0	0	10.7	22	250	M	M	1		28	270
23	58	29	44	8	21	0	0.00	0.0	0	8.5	17	250	M	M	2		22	230
24	62	35	49	13	16	0	0.00	0.0	0	4.7	13	140	M	M	6		17	150
25	51	46	49	12	16	0	0.16	0.0	0	4.4	14	220	M	M	10	18	18	230
26	49	45	47	10	18	0	0.01	0.0	0	7.1	16	90	M	M	10	1	23	90
27	47	31	39	2	26	0	0.32	0.0	0	21.9	38	260	M	M	6	1	47	270
28	43	29	36	-2	29	0	0.00	0.0	0	18.2	31	240	M	M	5		40	250
29	36	26	31	-7	34	0	T	T	0	14.8	25	310	M	M	5		32	290
SM	1377	943		719	0	2.60	T	273.6					M		207			
AV	47.5	32.5								9.4	FASTST		M	M	7		MAX(MPH)	
									MISC ---->	# 44	260						# 54	270

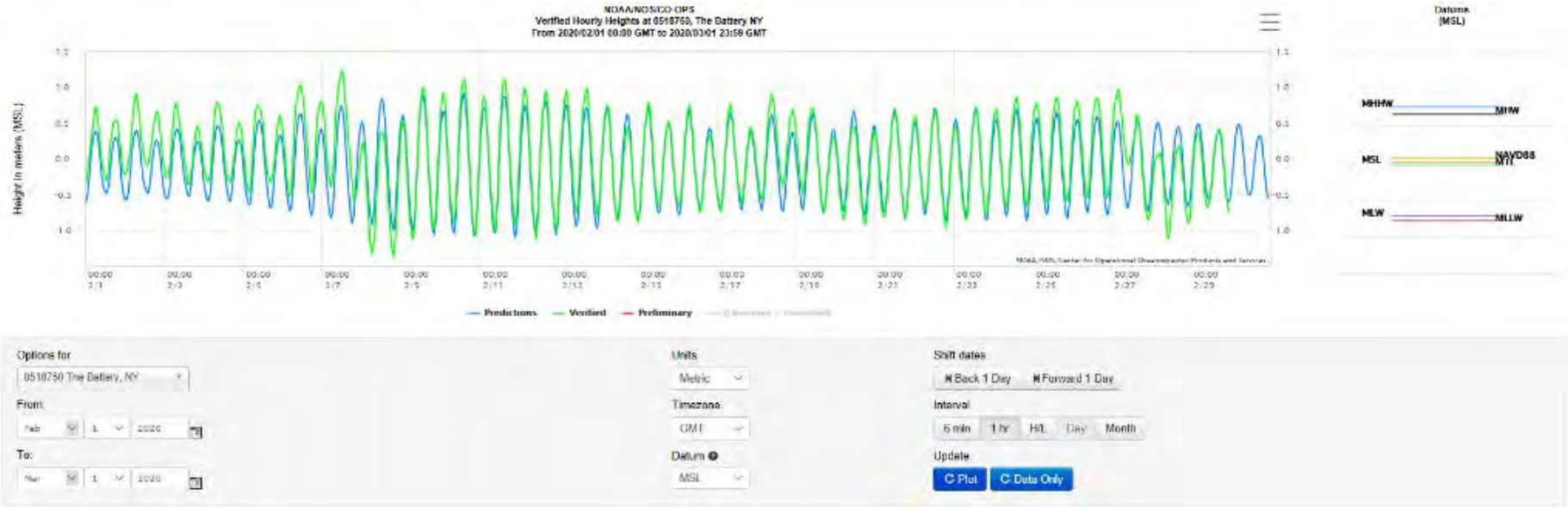
https://w2.weather.gov/climate/index.php?wfo=okx

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
11:46 AM	50 °F	50 °F	100 %	VAR	3 mph	0 mph	28.82 in	0.0 in	Cloudy
11:51 AM	51 °F	50 °F	96 %	CALM	0 mph	0 mph	28.83 in	0.0 in	Cloudy
12:28 PM	59 °F	54 °F	83 %	SW	35 mph	47 mph	28.79 in	0.0 in	Heavy Rain / Windy
12:38 PM	58 °F	51 °F	78 %	SW	26 mph	45 mph	28.80 in	0.1 in	Light Rain / Windy
12:51 PM	56 °F	50 °F	80 %	SW	25 mph	38 mph	28.79 in	0.1 in	Light Rain / Windy
1:51 PM	50 °F	43 °F	77 %	WSW	30 mph	48 mph	28.87 in	0.0 in	Cloudy / Windy
2:51 PM	47 °F	38 °F	71 %	W	43 mph	52 mph	28.99 in	0.0 in	Mostly Cloudy / Windy
3:51 PM	41 °F	35 °F	79 %	W	26 mph	37 mph	29.10 in	0.0 in	Light Rain / Windy
4:51 PM	38 °F	30 °F	73 %	W	29 mph	43 mph	29.22 in	0.0 in	Mostly Cloudy / Windy
5:51 PM	37 °F	25 °F	62 %	W	31 mph	41 mph	29.31 in	0.0 in	Mostly Cloudy / Windy
5:57 PM	37 °F	26 °F	65 %	W	23 mph	41 mph	29.31 in	0.0 in	Mostly Cloudy / Windy

Averaged wind speed over the 6-hour period =	30	mph

https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2020-2-7



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200201&edate=20200301&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **March 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.13 Date: 3/23/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.64 Date: 3/7/2020 Time: 6:00 Exceeds event trigger criteria? NO Max Tide Gauge Reading (m): 1.288 Date: 3/13/2020 Time: 4:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 35 Date: 3/13/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: W OK Note: (1) The averaged wind speed for the 6-hour period during which the maximum wind speed was recorded does not exceed the threshold criteria.	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

```
118
CXUS51 KOKX 012046
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     MARCH
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                      12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  46  24  35  -3  30   0 0.00  0.0    0 10.0 21 280   M    M   3        33 270
 2  62  33  48  10  17   0 0.00  0.0    0  9.7 25 220   M    M   7        34 210
 3  59  48  54  16  11   0 0.24  0.0    0  8.1 30 250   M    M   9 13     39 270
 4  58  44  51  13  14   0    T  0.0    0 18.1 31 270   M    M   4        39 270
 5  54  40  47   8  18   0 0.00  0.0    0  8.7 21 320   M    M   5        27 320
 6  47  34  41   2  24   0 0.36  0.0    0  9.6 22  10   M    M   9 18     26 360
 7  49  36  43   4  22   0    T    T    0 15.9 28 350   M    M   5        35 340
 8  60  31  46   6  19   0 0.00  0.0    0 10.4 20 230   M    M   4        26 240
 9  74  38  56  16   9   0 0.00  0.0    0 11.8 24 240   M    M   5        30 230
10  68  49  59  19   6   0    T  0.0    0 14.9 26 230   M    M   9        36 240
11  57  43  50  10  15   0 0.00  0.0    0  6.9 25 330   M    M   7        30 320
12  49  39  44   3  21   0 0.01  0.0    0  6.0 14  90   M    M   9 1      18 110
13  72  48  60  19   5   0 0.29  0.0    0 13.2 35 270   M    M   6 12     47 250
14  58  42  50   9  15   0 0.00  0.0    0 13.1 24 320   M    M   6        30 310
15  55  39  47   5  18   0 0.00  0.0    0  9.2 17  20   M    M   5        26  20
16  44  31  38  -4  27   0    T  0.0    0 10.8 17  10   M    M   5        22 110
17  55  42  49   7  16   0 0.22  0.0    0  8.0 18 250   M    M   8 1      23 240
18  53  41  47   4  18   0    T  0.0    0  7.6 14 160   M    M   6        19 330
19  52  41  47   4  18   0 1.12  0.0    0  7.5 17  30   M    M  10 1      21  30
20  80  46  63  20   2   0    T  0.0    0  9.8 26 240   M    M   9 18     32 310
21  67  39  53   9  12   0 0.00  0.0    0 13.4 28 350   M    M   6        36 350
22  44  33  39  -5  26   0 0.00  0.0    0 12.5 18  30   M    M   7        23 110
23  41  37  39  -5  26   0 1.13    T    0 13.2 24  10   M    M  10 148    34  30
24  57  36  47   2  18   0 0.00  0.0    0  9.7 20 330   M    M   6        25 340
25  46  40  43  -2  22   0 0.01  0.0    0 11.7 24  40   M    M   9        34  50
26  61  34  48   3  17   0 0.00  0.0    0  8.1 17 230   M    M   3        22 240
27  70  49  60  14   5   0    T  0.0    0  9.8 20 350   M    M   6        26 360
28  53  45  49   3  16   0 0.23  0.0    0  8.8 16  30   M    M  10 1      19  30
29  49  45  47   1  18   0 0.01  0.0    0 12.3 20  20   M    M  10 1      23  30
30  50  45  48   1  17   0 0.11  0.0    0  4.6 12  40   M    M   9 1      14  50
31  47  41  44  -3  21   0 0.03  0.0    0  6.0 12  60   M    M   9 18     16  60
==============================================================================
SM 1737 1233       523   0  3.76    T    319.4          M      216
==============================================================================
AV 56.0 39.8                              10.3 FASTST   M    M   7    MAX(MPH)
                                  MISC ---->  # 35 270              # 47  250
==============================================================================
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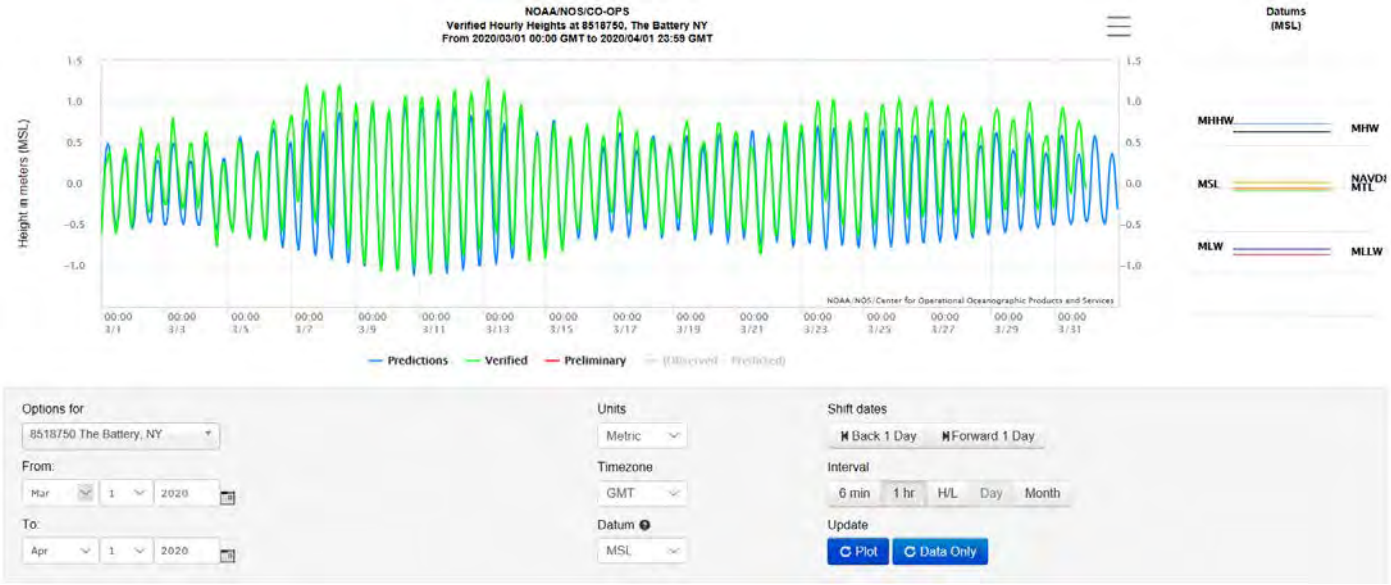
https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200301&edate=20200401&timezone=GMT&datum=MSL&interval=h&action=

ATTACHMENT B.2
Q2 2020 HYDRAULIC AND HYDRODYNAMIC EVALUATION SUMMARIES

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **April** **2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.69 Date: 4/13/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.791 Date: 4/4/2020 Time: 5:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.413 Date: 4/9/2020 Time: 2:00 Exceeds event trigger criteria? YES 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 37 Date: 4/21/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: WSW OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

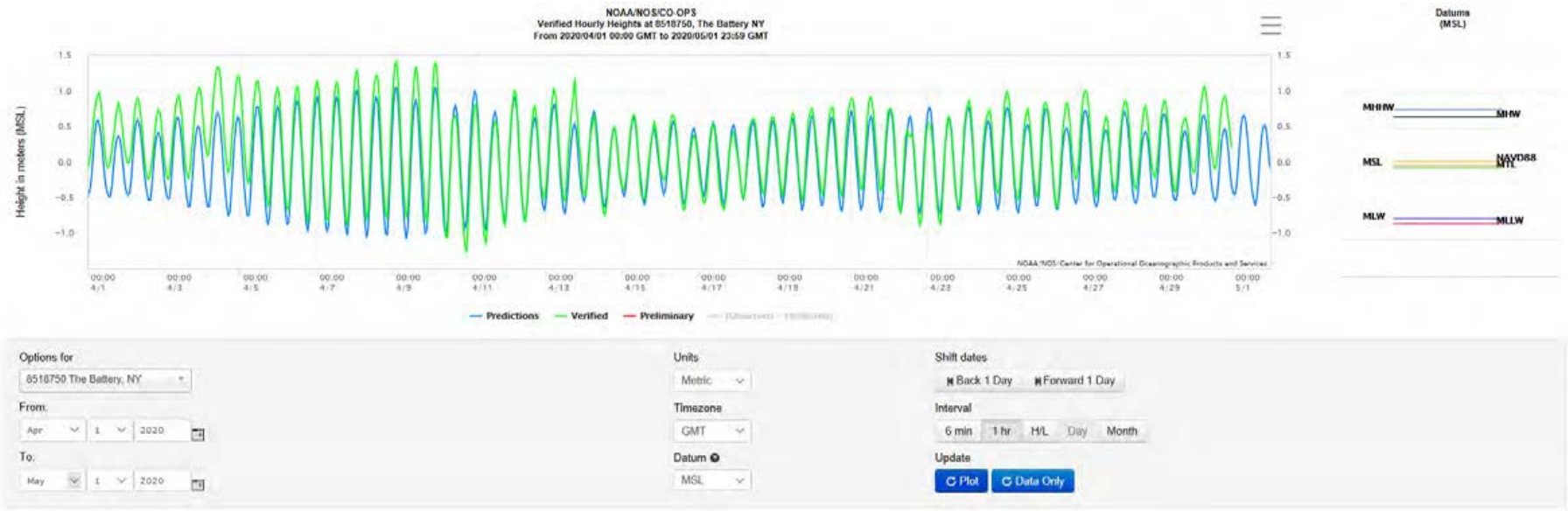
```
000
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     APRIL
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  57  39  48   0  17   0 0.00  0.0    0 12.3 21 320   M    M   7        29 300
 2  60  38  49   1  16   0 0.00  0.0    0 19.5 32 330   M    M   4        41 310
 3  56  45  51   3  14   0 0.05  0.0    0 17.6 29 340   M    M  10        36 330
 4  61  46  54   5  11   0    T  0.0    0  8.3 20  10   M    M   9 1      23  20
 5  64  44  54   5  11   0 0.00  0.0    0  2.9 15 140   M    M   8        18 140
 6  68  48  58   9   7   0 0.06    M    0  9.0 20 310   M    M   5        23 300
 7  68  52  60  10   5   0 0.00  0.0    0  6.6 17 210   M    M   8        22 230
 8  69  49  59   9   6   0 0.22  0.0    0  9.0 21 340   M    M   7 1      27 300
 9  64  40  52   1  13   0 0.06  0.0    0 12.6 37 300   M    M   7 38     48 300
10  50  37  44  -7  21   0    T    T    0 22.0 35 290   M    M   7        49 280
11  56  37  47  -4  18   0 0.00  0.0    0 13.7 24 290   M    M   2        40 280
12  65  37  51  -1  14   0    T  0.0    0  8.1 21 180   M    M   6        29 180
13  69  55  62  10   3   0 1.69  0.0    0 17.3 32 170   M    M   8 1      48 180
14  60  47  54   2  11   0    T  0.0    0 11.1 23 280   M    M   7        34 290
15  54  42  48  -5  17   0    T  0.0    0 12.4 22 290   M    M   4        29 280
16  51  37  44  -9  21   0 0.00  0.0    0 15.5 30 280   M    M   5        37 270
17  51  32  42 -12  23   0 0.07  0.0    0  8.8 24 270   M    M   7 1      30 230
18  47  40  44 -10  21   0 0.16  0.0    0  9.6 23 330   M    M   8 1      30 310
19  63  33  48  -6  17   0 0.00  0.0    0 12.7 28 230   M    M   5        35 220
20  56  42  49  -5  16   0 0.00  0.0    0  9.2 18  10   M    M   8        22 360
21  62  40  51  -4  14   0 0.17  0.0    0 13.3 37 240   M    M   5 38     45 240
22  53  36  45 -10  20   0 0.00  0.0    0 15.1 30 260   M    M   3        46 270
23  52  40  46 -10  19   0 0.14    T    0  5.7 14 340   M    M   9 14     17 340
24  50  42  46 -10  19   0 0.59  0.0    0 11.2 18  20   M    M   9 1      23  10
25  64  41  53  -3  12   0 0.00  0.0    0  5.0 15 150   M    M   8 1      19 160
26  51  42  47  -9  18   0 0.11  0.0    0 12.7 24  40   M    M  10 1      31  40
27  52  40  46 -11  19   0    T  0.0    0 14.2 28 350   M    M  10 1      32 340
28  68  40  54  -3  11   0 0.00  0.0    0  7.7 18 300   M    M   4        26 310
29  56  49  53  -5  12   0 0.01  0.0    0  9.2 17 100   M    M   8 1      26 120
30  59  50  55  -3  10   0 0.47  0.0    0 14.3 31 140   M    M  10 18     44 140
==============================================================================
SM 1756 1260       436   0  3.80    T    346.6          M      208
==============================================================================
AV 58.5 42.0                             11.6 FASTST   M    M   7    MAX(MPH)
                                 MISC ---->  # 37 300              # 49  280
==============================================================================
```

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200401&edate=20200501&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **May** **2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 0.79 Date: 5/23/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.587 Date: 5/1/2020 Time: 2:00 Exceeds event trigger criteria? NO Max Tide Gauge Reading (m): 1.386 Date: 5/9/2020 Time: 2:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 36 Date: 5/11/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: W OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

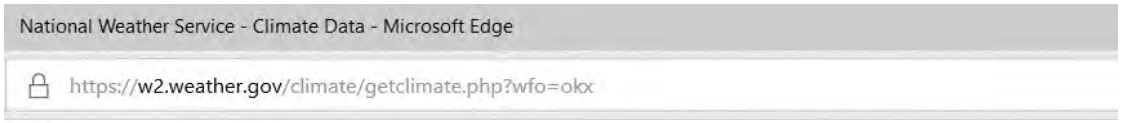
ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

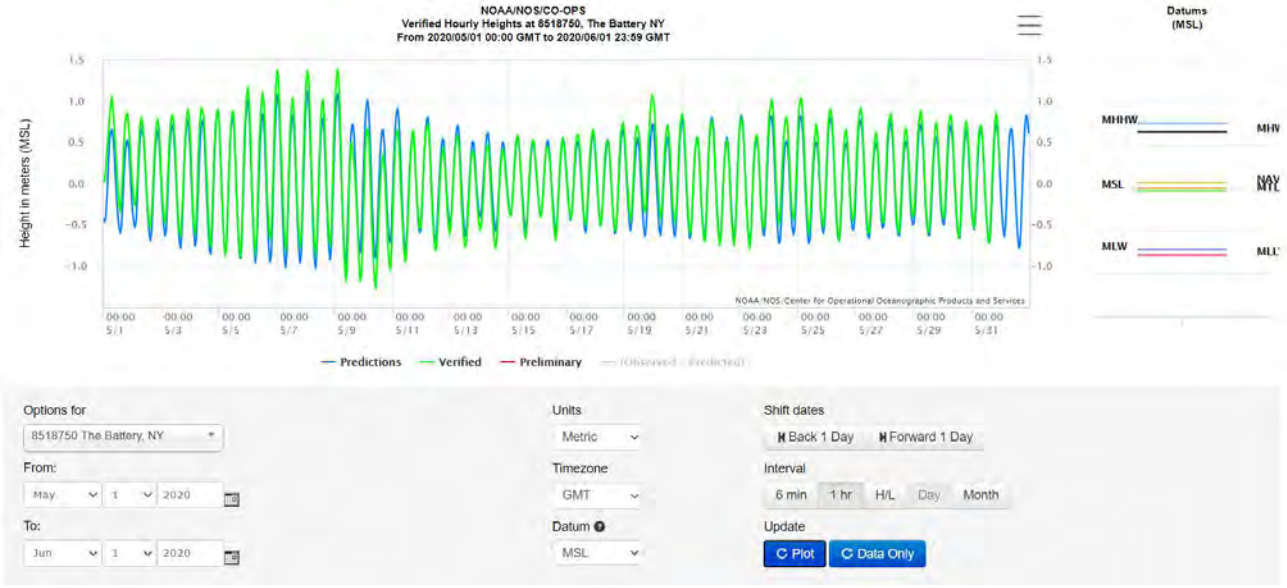


373
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: NEWARK NJ
MONTH: MAY
YEAR: 2020
LATITUDE: 40 42 N
LONGITUDE: 74 10 W

TEMPERATURE IN F:							:PCPN:		SNOW:	WIND			:SUNSHINE:		SKY		:PK WND	
1	2	3	4	5	6A	6B	7	8	9	10	11	12	13	14	15	16	17	18
									12Z	AVG	MX	2MIN						
DY	MAX	MIN	AVG	DEP	HDD	CDD	WTR	SNW	DPTH	SPD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	68	53	61	3	4	0	0.12	0.0	0	8.7	22	350	M	M	9	1	29	340
2	75	51	63	5	2	0	0.00	0.0	0	13.5	26	330	M	M	5		33	330
3	80	55	68	9	0	3	0.05	0.0	0	10.4	22	260	M	M	8		27	230
4	74	49	62	3	3	0	T	0.0	0	14.8	35	330	M	M	7		45	330
5	64	46	55	-4	10	0	0.00	0.0	0	8.8	21	340	M	M	6		33	310
6	54	46	50	-10	15	0	0.15	0.0	0	6.9	15	90	M	M	9	1	22	70
7	68	44	56	-4	9	0	0.00	0.0	0	11.4	28	250	M	M	5		33	250
8	58	37	48	-12	17	0	0.43	0.0	0	8.1	28	330	M	M	9	1	37	330
9	50	34	42	-18	23	0	T	T	0	20.3	32	310	M	M	5		43	270
10	65	35	50	-11	15	0	0.00	0.0	0	16.9	30	250	M	M	5		37	250
11	64	44	54	-7	11	0	0.04	0.0	0	12.0	36	270	M	M	7	1	45	260
12	62	44	53	-8	12	0	0.00	0.0	0	14.9	28	290	M	M	5		37	280
13	66	41	54	-8	11	0	0.00	0.0	0	9.5	22	270	M	M	1		26	280
14	67	43	55	-7	10	0	T	0.0	0	5.9	15	110	M	M	6	8	20	110
15	86	59	73	11	0	8	0.02	0.0	0	12.5	26	220	M	M	7		38	230
16	78	60	69	6	0	4	T	0.0	0	9.9	22	330	M	M	8		27	340
17	67	55	61	-2	4	0	T	0.0	0	8.1	16	160	M	M	8		22	140
18	69	55	62	-1	3	0	0.00	0.0	0	8.4	16	110	M	M	8		22	110
19	68	55	62	-2	3	0	0.00	0.0	0	14.1	24	50	M	M	7		34	50
20	66	50	58	-6	7	0	0.00	0.0	0	10.3	18	140	M	M	7		25	110
21	66	47	57	-7	8	0	0.00	0.0	0	5.9	12	130	M	M	2		17	160
22	77	52	65	1	0	0	0.03	0.0	0	4.7	14	140	M	M	7	1	18	110
23	71	55	63	-2	2	0	0.79	0.0	0	7.3	22	40	M	M	10	12	28	40
24	68	53	61	-4	4	0	T	0.0	0	9.0	17	50	M	M	8		21	40
25	73	56	65	-1	0	0	T	0.0	0	6.4	12	130	M	M	8	1	15	90
26	77	58	68	2	0	3	0.00	0.0	0	3.9	12	160	M	M	6	18	16	160
27	79	59	69	3	0	4	T	0.0	0	4.6	12	140	M	M	9	12	16	140
28	78	62	70	4	0	5	T	0.0	0	6.6	21	190	M	M	10	18	26	170
29	86	68	77	10	0	12	T	0.0	0	8.8	25	290	M	M	9	13	31	290
30	84	68	76	9	0	11	0.03	0.0	0	11.4	21	340	M	M	6		26	280
31	73	55	64	-4	1	0	0.00	0.0	0	15.5	25	330	M	M	2		33	300
SM	2181	1589		174	50	1.66		T		309.5			M		209			
AV	70.4	51.3								10.0	FASTST		M	M	7		MAX(MPH)	
									MISC ---->	# 36	270						# 45	330

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200501&edate=20200601&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **June** **2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.44 Date: 6/30/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.305 Date: 6/28/2020 Time: 15:00 Exceeds event trigger criteria? NO Max Tide Gauge Reading (m): 1.244 Date: 6/5/2020 Time: 0:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 33 Date: 6/28/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: N OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

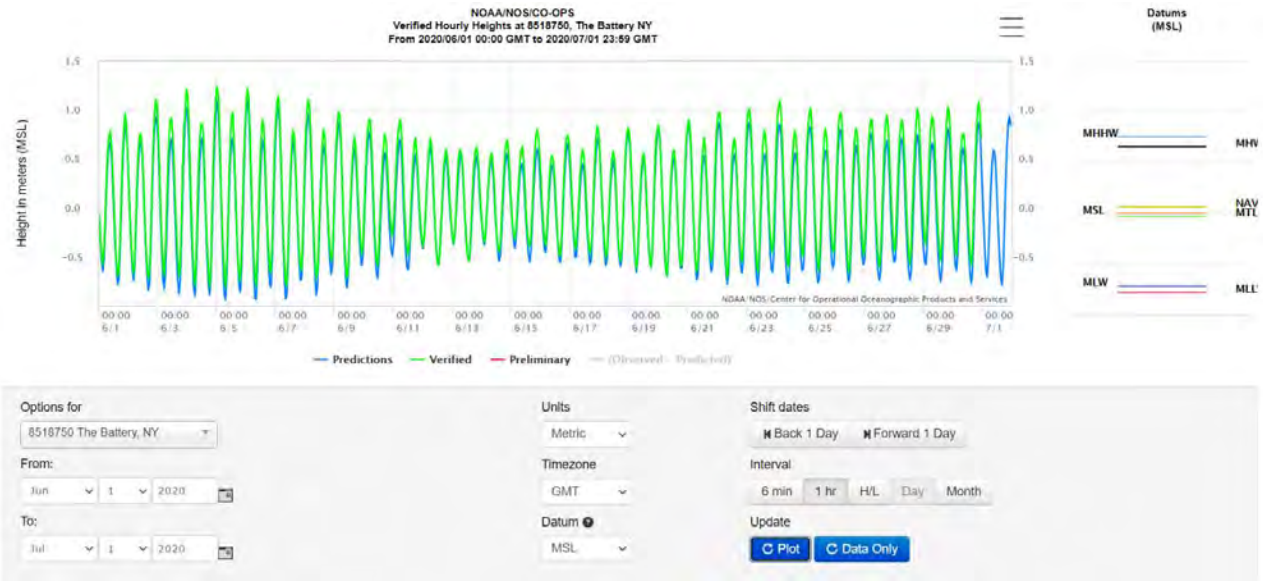
```
616
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     JUNE
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9    10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  74  51  63  -5   2   0 0.00  0.0    0 10.1 21 290   M    M   4        30 290
 2  76  53  65  -3   0   0 0.14  0.0    0  8.8 14 240   M    M   8 3      23 240
 3  81  59  70   2   0   5 0.80  0.0    0  8.7 31 320   M    M   7 13     39 310
 4  88  65  77   8   0  12 0.13  0.0    0  6.2 18 270   M    M   8 13     24 190
 5  82  70  76   7   0  11 0.19  0.0    0  6.5 16 230   M    M   9 13     20 250
 6  91  71  81  11   0  16    T  0.0    0 10.4 25 260   M    M   6 3      34 250
 7  80  64  72   2   0   7 0.00  0.0    0 14.4 25 310   M    M   4        35 330
 8  82  58  70   0   0   5 0.00  0.0    0  7.7 16 290   M    M   4        28 300
 9  91  61  76   6   0  11 0.00  0.0    0  9.9 21 260   M    M   3        27 240
10  86  70  78   7   0  13 0.00  0.0    0  7.7 16 110   M    M   7        22 180
11  87  73  80   9   0  15 0.08  0.0    0 12.0 24 210   M    M   9 13     30 230
12  88  70  79   7   0  14 0.00  0.0    0 10.4 20 260   M    M   5        27 240
13  77  58  68  -4   0   3 0.00  0.0    0 12.1 23  20   M    M   2        27 350
14  75  53  64  -8   1   0 0.00  0.0    0  9.2 16  20   M    M   3        21  10
15  75  56  66  -6   0   1 0.00  0.0    0  8.0 18  20   M    M   6        21  10
16  78  57  68  -5   0   3 0.00  0.0    0  8.4 17  60   M    M   6        24  40
17  80  60  70  -3   0   5 0.00  0.0    0  8.1 17  30   M    M   7 1      22  40
18  77  64  71  -2   0   6 0.01  0.0    0  5.3 10 180   M    M   9 1      13 150
19  84  65  75   1   0  10    T  0.0    0  5.5 14 170   M    M   8 1      19 160
20  87  67  77   3   0  12 0.00  0.0    0  5.2 17 180   M    M   7 3      24 190
21  86  67  77   3   0  12 0.00  0.0    0  6.3 13 240   M    M   8        19 140
22  92  69  81   7   0  16 0.00  0.0    0  7.7 15 200   M    M   5        20 150
23  88  71  80   5   0  15    T  0.0    0  7.0 15 130   M    M   6        20 120
24  88  75  82   7   0  17 0.00  0.0    0 11.5 23 270   M    M   7        33 250
25  88  69  79   4   0  14 0.00  0.0    0  6.8 18 190   M    M   7        23 170
26  89  66  78   3   0  13 0.00  0.0    0  8.3 17 260   M    M   6        23 310
27  86  68  77   1   0  12 0.10  0.0    0  7.8 23 240   M    M   8 1      30 220
28  93  72  83   7   0  18    T  0.0    0  6.9 33 350   M    M   7 3      40 350
29  91  71  81   5   0  16 0.00  0.0    0  9.8 26  20   M    M   5 3      31  20
30  82  68  75  -1   0  10 1.44  0.0    0  6.3 22 350   M    M   7 138    25 360
==============================================================================
SM 2522 1941         3 292  2.89     0.0 253.0          M      188
==============================================================================
AV 84.1 64.7                              8.4 FASTST   M    M   6    MAX(MPH)
                                  MISC ---->  # 33 350              # 40  350
==============================================================================
```

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200601&edate=20200701&timezone=GMT&datum=MSL&interval=h&action=

ATTACHMENT B.3
Q3 2020 HYDRAULIC AND HYDRODYNAMIC EVALUATION SUMMARIES

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **July** **2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 2.78 Date: 7/10/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.67 Date: 7/10/2020 Time: 20:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.263 Date: 7/4/2020 Time: 0:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 40 Date: 7/22/2020 Exceeds trigger criteria? YES Wind direction over 6-hr period: W OK Note: (1) The averaged wind speed for the 6-hour period during which the maximum wind speed was recorded does not exceed the threshold criteria.	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

```
000
CXUS51 KOKX 071454
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     JULY
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  80  67  74  -2   0   9 0.23  0.0    0  5.6 21 360   M    M   7 138    24 360
 2  95  67  81   5   0  16 0.00  0.0    0  7.2 22 320   M    M   5        27 310
 3  94  73  84   7   0  19 1.11  0.0    0  7.0 17 100   M    M   8 13     26 300
 4  87  70  79   2   0  14    T  0.0    0  6.6 12 180   M    M   7 18     18 120
 5  95  71  83   6   0  18    T  0.0    0  7.0 13 320   M    M   7        18 330
 6  94  70  82   5   0  17 0.58  0.0    0  6.2 38 200   M    M   6 13     47 190
 7  83  73  78   1   0  13 0.00  0.0    0  7.3 15 120   M    M   8        20 110
 8  86  72  79   2   0  14 1.15  0.0    0  5.7 17 280   M    M   8 13     24 270
 9  88  73  81   4   0  16 0.00  0.0    0  5.7 14 150   M    M   6 18     20 150
10  79  73  76  -1   0  11 2.78  0.0    0 12.5 26  90   M    M   9 13     38 100
11  87  71  79   2   0  14 0.89  0.0    0  9.6 33 250   M    M   7 138    39 250
12  91  71  81   3   0  16    T  0.0    0 11.5 20 260   M    M   4        28 250
13  89  71  80   2   0  15 0.05  0.0    0  8.8 18 280   M    M   6        28 300
14  87  71  79   1   0  14 0.00  0.0    0 10.3 17 300   M    M   3        24 300
15  82  69  76  -2   0  11 0.00  0.0    0  8.6 15 150   M    M   6        20 140
16  78  70  74  -4   0   9 0.00  0.0    0  9.8 18 120   M    M   8        25 150
17  87  70  79   1   0  14 0.07  0.0    0  5.9 12 240   M    M   9 1      15 220
18  93  71  82   4   0  17 0.00  0.0    0  5.9 13 270   M    M   5        19 310
19  96  74  85   7   0  20 0.00  0.0    0 10.3 18 210   M    M   7        24 240
20  96  80  88  10   0  23 0.00  0.0    0  9.9 20 260   M    M   7        29 260
21  91  77  84   6   0  19    T  0.0    0  6.6 14 160   M    M   5 3      18 160
22  94  72  83   5   0  18 0.98  0.0    0  6.0 40 270   M    M   7 13     53 270
23  91  73  82   4   0  17    T  0.0    0  9.8 21 240   M    M   8 13     26 250
24  81  72  77  -1   0  12 2.14  0.0    0  6.0 23 240   M    M   9 13     30 230
25  90  72  81   3   0  16 0.00  0.0    0  6.0 15 200   M    M   5        19 200
26  94  75  85   7   0  20 0.00  0.0    0 11.1 24 270   M    M   7        31 270
27  96  75  86   8   0  21 0.00  0.0    0 11.5 23 250   M    M   6        28 250
28  95  80  88  11   0  23 0.14  0.0    0 10.8 25 280   M    M   5        31 290
29  92  77  85   8   0  20 0.00  0.0    0  5.2 16 240   M    M   5        18 250
30  94  74  84   7   0  19    T  0.0    0  7.7 17 230   M    M   8 3      23 260
31  83  70  77   0   0  12 1.10  0.0    0  4.8 25 330   M    M   8 13     34 230
==============================================================================
SM 2768 2244         0 497 11.22     0.0 246.9          M      206
==============================================================================
AV 89.3 72.4                                8.0 FASTST   M    M   7    MAX(MPH)
                                 MISC ----->  # 40 270               # 53  270
==============================================================================
```

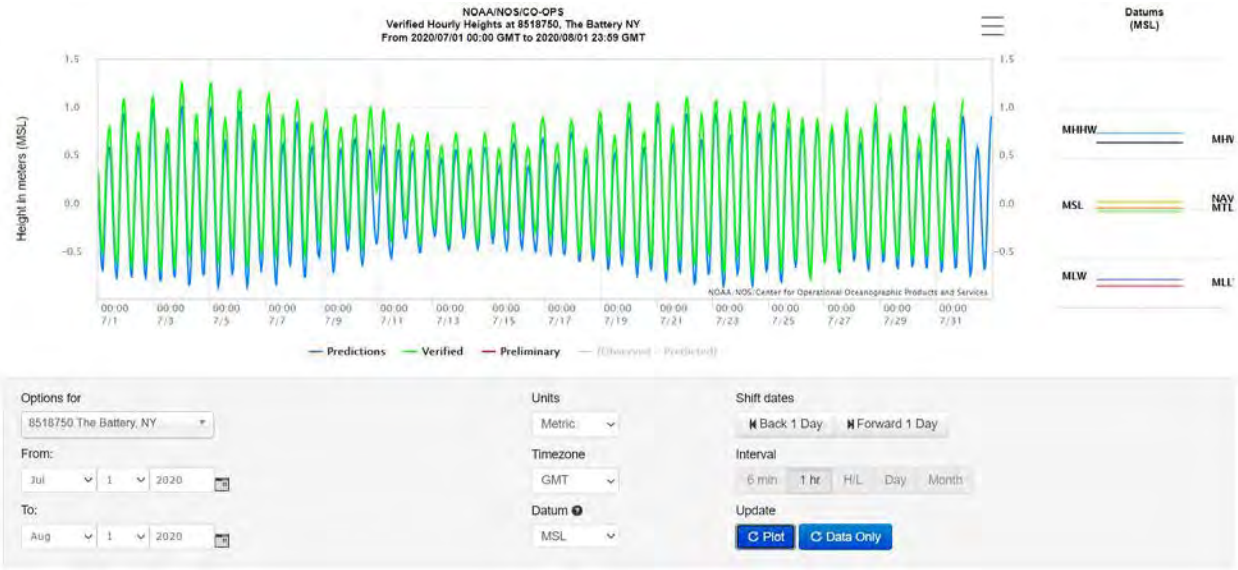
https://w2.weather.gov/climate/index.php?wfo=okx

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
3:51 PM	91 °F	72 °F	53 %	S	12 mph	0 mph	29.94 in	0.0 in	Mostly Cloudy
4:51 PM	91 °F	72 °F	53 %	SSE	9 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
5:51 PM	90 °F	73 °F	57 %	SSW	6 mph	0 mph	29.92 in	0.0 in	Mostly Cloudy
5:58 PM	90 °F	73 °F	57 %	S	7 mph	0 mph	29.92 in	0.0 in	Thunder
6:37 PM	82 °F	74 °F	76 %	WNW	24 mph	32 mph	29.94 in	0.0 in	T-Storm / Windy
6:42 PM	79 °F	73 °F	82 %	W	29 mph	38 mph	29.95 in	0.1 in	Heavy T-Storm / Wind
6:51 PM	72 °F	70 °F	93 %	W	24 mph	53 mph	30.01 in	0.3 in	Heavy T-Storm / Wind
7:05 PM	72 °F	71 °F	97 %	WNW	25 mph	33 mph	30.01 in	0.5 in	Heavy T-Storm / Wind
7:08 PM	72 °F	71 °F	97 %	W	24 mph	33 mph	30.00 in	0.5 in	Light Rain with Thund
7:15 PM	73 °F	71 °F	93 %	W	30 mph	38 mph	29.99 in	0.5 in	Heavy T-Storm / Wind
7:22 PM	73 °F	71 °F	93 %	W	20 mph	38 mph	29.99 in	0.6 in	Heavy T-Storm
7:51 PM	74 °F	71 °F	91 %	SW	8 mph	0 mph	30.00 in	0.6 in	Light Rain with Thund
8:27 PM	74 °F	70 °F	87 %	VAR	5 mph	0 mph	29.99 in	0.0 in	Light Rain
8:51 PM	74 °F	70 °F	87 %	SSW	5 mph	0 mph	29.99 in	0.1 in	Light Rain
9:51 PM	75 °F	70 °F	84 %	SW	7 mph	0 mph	29.98 in	0.0 in	Cloudy

Averaged wind speed over the 6-hour period =	16	mph

https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2020-7-22



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200701&edate=20200801&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **August** **2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 0.72 Date: 8/4/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 1.348 Date: 8/4/2020 Time: 18:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.222 Date: 8/16/2020 Time: 23:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 49 Date: 8/27/2020 Exceeds trigger criteria? YES Wind direction over 6-hr period: N OK Note: (1) The averaged wind speed for the 6-hour period during which the maximum wind speed was recorded does not exceed the threshold criteria.	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

```
000
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                          STATION:   NEWARK NJ
                                          MONTH:     AUGUST
                                          YEAR:      2020
                                          LATITUDE:   40 42 N
                                          LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
=================================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                      12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
=================================================================================

 1  88  69  79   2   0  14    T  0.0    0  7.2 15 160   M    M   5        19 160
 2  93  77  85   8   0  20    T  0.0    0 11.2 21 220   M    M   8        28 200
 3  91  74  83   6   0  18 0.34  0.0    0  9.1 36 230   M    M   6 138    43 230
 4  81  70  76  -1   0  11 0.72  0.0    0 14.0 47 260   M    M   8 13     68 130
 5  88  72  80   3   0  15 0.00  0.0    0  8.9 20 250   M    M   4        24 260
 6  81  70  76  -1   0  11    T  0.0    0  5.5 14 360   M    M   8        17 360
 7  80  68  74  -3   0   9 0.60  0.0    0  6.0 14  20   M    M   9 13     18 130
 8  84  69  77   0   0  12    T  0.0    0  6.1 13 150   M    M   7 1      18 120
 9  90  69  80   3   0  15 0.00  0.0    0  7.7 15 150   M    M   6        19 150
10  94  73  84   7   0  19 0.00  0.0    0  7.8 16 250   M    M   2 1      21 250
11  88  75  82   5   0  17 0.04  0.0    0  7.6 24 160   M    M   5 138    32 160
12  91  77  84   8   0  19    T  0.0    0  5.9 16 200   M    M   7 38     22 190
13  81  72  77   1   0  12 0.49  0.0    0  6.0 13  40   M    M   8 13     17  50
14  89  73  81   5   0  16 0.00  0.0    0  7.5 18  40   M    M   8        22  40
15  85  70  78   2   0  13 0.00  0.0    0  9.7 16 150   M    M   8        21  80
16  73  67  70  -6   0   5 0.14  0.0    0 12.8 18 360   M    M  10 18    25  30
17  84  64  74  -2   0   9 0.01  0.0    0  5.8 17 340   M    M   6        22 340
18  85  63  74  -2   0   9 0.28  0.0    0  7.5 22 320   M    M   5 13     32 300
19  78  66  72  -4   0   7 0.21  0.0    0  6.1 17 260   M    M   6 13     23 290
20  83  61  72  -4   0   7 0.00  0.0    0  6.6 14 280   M    M   4        17 280
21  87  65  76   1   0  11 0.00  0.0    0 10.5 20 240   M    M   7        23 240
22  92  71  82   7   0  17 0.00  0.0    0  9.4 17 230   M    M   7 3      25 240
23  87  71  79   4   0  14 0.00  0.0    0  6.2 14 170   M    M   7        19 160
24  93  72  83   8   0  18 0.00  0.0    0  8.5 17 260   M    M   6        23 260
25  92  73  83   8   0  18    T  0.0    0 12.9 28 350   M    M   4 3      35 260
26  82  67  75   1   0  10 0.00  0.0    0 12.1 21 320   M    M   5        28 290
27  93  68  81   7   0  16 0.34  0.0    0  9.6 49 350   M    M   7 13     71 340
28  89  69  79   5   0  14 0.02  0.0    0  9.1 15 230   M    M   7        22 330
29  84  71  78   4   0  13    T  0.0    0 10.5 21 260   M    M   8        26 230
30  82  64  73  -1   0   8 0.00  0.0    0 12.5 25 290   M    M   5        31 290
31  78  61  70  -3   0   5    T  0.0    0  6.8 12  20   M    M   8        16 110
=================================================================================
SM 2666 2151         0 402  3.19     0.0 267.1          M      201
=================================================================================
AV 86.0 69.4                                 8.6 FASTST   M    M   6    MAX(MPH)
                                  MISC ---->  # 49 350                # 71  340
=================================================================================
```

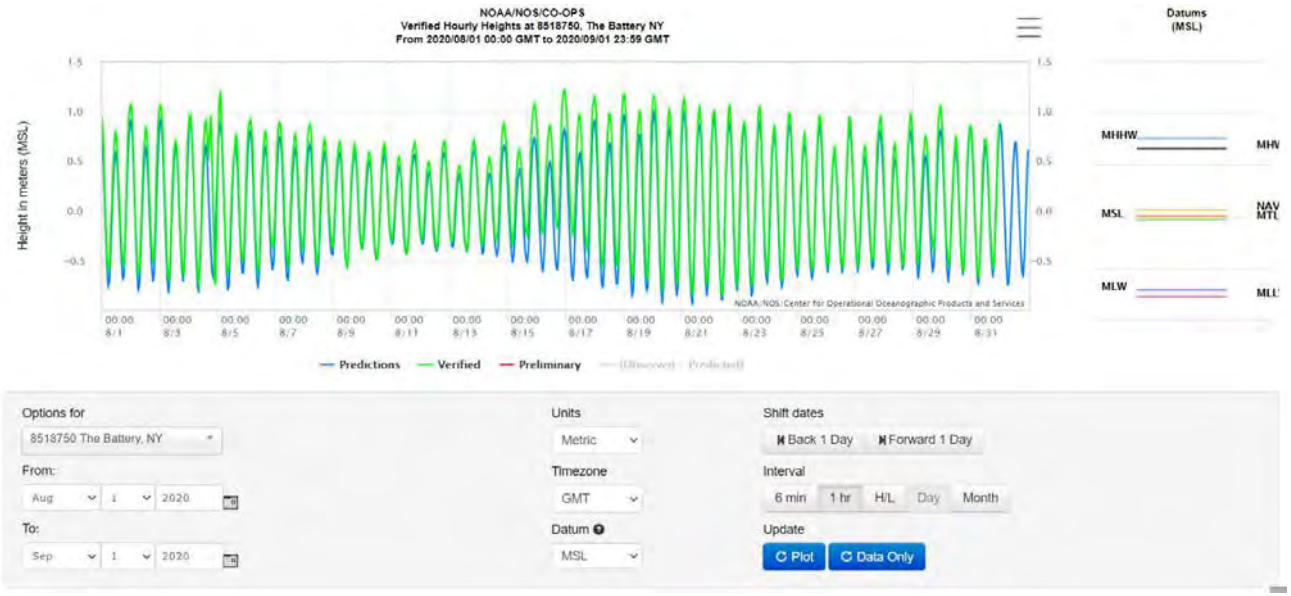
https://w2.weather.gov/climate/index.php?wfo=okx

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
4:51 PM	93 °F	68 °F	44 %	SW	14 mph	28 mph	29.61 in	0.0 in	Partly Cloudy
5:51 PM	93 °F	69 °F	45 %	WSW	14 mph	21 mph	29.62 in	0.0 in	Partly Cloudy
6:51 PM	91 °F	70 °F	50 %	WSW	16 mph	0 mph	29.63 in	0.0 in	Mostly Cloudy
7:36 PM	90 °F	70 °F	52 %	SW	10 mph	0 mph	29.63 in	0.0 in	Thunder
7:45 PM	90 °F	70 °F	52 %	SW	12 mph	0 mph	29.64 in	0.0 in	Thunder
7:57 PM	84 °F	67 °F	56 %	N	25 mph	41 mph	29.68 in	0.0 in	Light Rain with Thunc
8:09 PM	78 °F	68 °F	71 %	N	23 mph	39 mph	29.69 in	0.0 in	Light Rain with Thunc
8:15 PM	78 °F	69 °F	74 %	NNW	26 mph	36 mph	29.73 in	0.0 in	Heavy T-Storm / Winc
8:18 PM	74 °F	69 °F	85 %	N	49 mph	71 mph	29.74 in	0.0 in	Heavy T-Storm / Winc
8:24 PM	73 °F	67 °F	81 %	N	21 mph	71 mph	29.70 in	0.2 in	T-Storm / Windy
8:51 PM	75 °F	68 °F	78 %	N	14 mph	0 mph	29.70 in	0.0 in	Thunder
9:35 PM	76 °F	66 °F	71 %	W	12 mph	0 mph	29.72 in	0.0 in	Cloudy
9:51 PM	74 °F	68 °F	82 %	SW	7 mph	0 mph	29.74 in	0.0 in	Light Rain
10:51 PM	76 °F	67 °F	74 %	VAR	3 mph	0 mph	29.73 in	0.0 in	Mostly Cloudy
11:51 PM	75 °F	67 °F	76 %	SSW	3 mph	0 mph	29.73 in	0.0 in	Mostly Cloudy

Averaged wind speed over the 6-hour period =	17	mph

https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2020-8-27



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200801&edate=20200901&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **September 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.43 Date: 9/10/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.497 Date: 9/23/2020 Time: 8:00 Exceeds event trigger criteria? NO Max Tide Gauge Reading (m): 1.329 Date: 9/19/2020 Time: 15:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 30 Date: 9/30/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: SSW OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

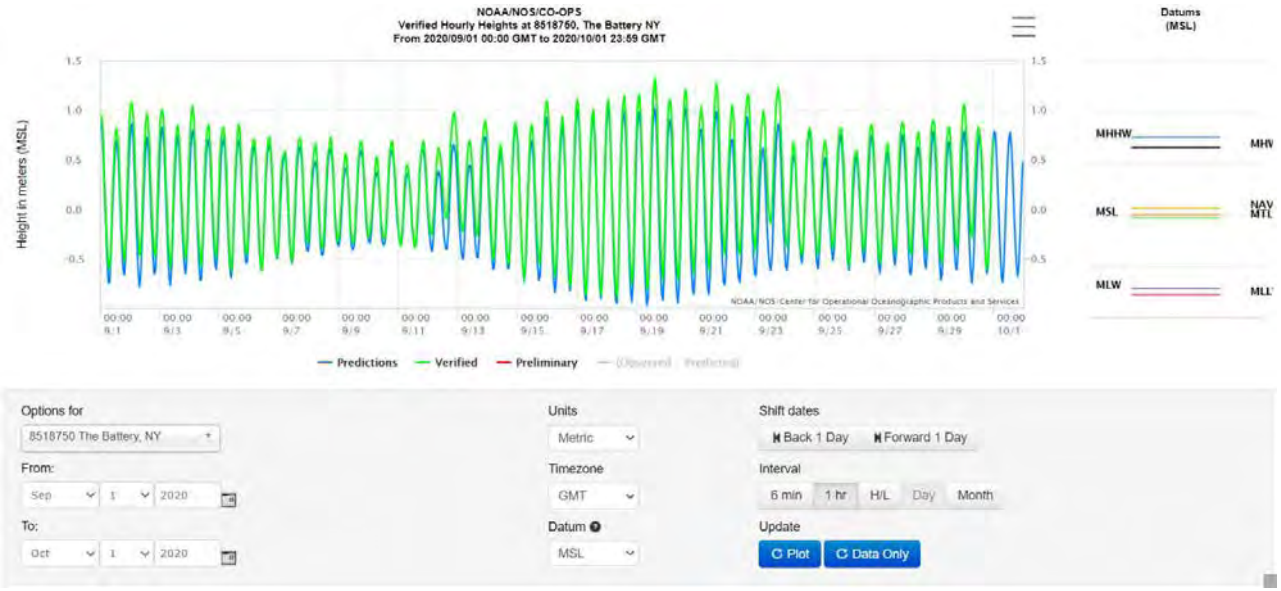
```
477
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     SEPTEMBER
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                      12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  79  68  74   1   0   9 0.12  0.0    0  8.3 16 110   M    M   9 1      23 120
 2  82  71  77   4   0  12 0.11  0.0    0  6.2 12 230   M    M   9 1      15  90
 3  89  70  80   7   0  15 0.85  0.0    0  7.1 16 320   M    M   8 13     21 330
 4  88  68  78   6   0  13 0.00  0.0    0  8.1 17 300   M    M   4        24 280
 5  81  65  73   1   0   8 0.00  0.0    0  7.6 16 360   M    M   4        22 360
 6  84  61  73   1   0   8 0.00  0.0    0  8.0 17 180   M    M   3        21 190
 7  79  65  72   1   0   7 0.00  0.0    0  5.8 17 130   M    M   6        23 150
 8  84  65  75   4   0  10 0.00  0.0    0  4.9 12 100   M    M   5        16  80
 9  82  71  77   6   0  12    T  0.0    0  4.5 10 160   M    M   9        13 160
10  86  74  80  10   0  15 1.43  0.0    0  4.7 16 290   M    M   9 13     18 290
11  78  62  70   0   0   5 0.00  0.0    0 10.6 18 360   M    M   7        22  20
12  74  60  67  -3   0   2 0.00  0.0    0  8.6 16 100   M    M   5        23 160
13  77  61  69   0   0   4    T  0.0    0  8.3 16 150   M    M   8        21 150
14  78  59  69   0   0   4    T  0.0    0 13.7 24 330   M    M   7        29 330
15  67  51  59 -10   6   0 0.00  0.0    0  8.1 17  10   M    M   7        21  20
16  73  52  63  -5   2   0 0.00  0.0    0  7.0 16 200   M    M   8        20 200
17  77  61  69   1   0   4 0.00  0.0    0  5.3 14 210   M    M  10        17 250
18  73  54  64  -3   1   0 0.00  0.0    0 16.2 26  10   M    M   7        33  10
19  65  48  57 -10   8   0 0.00  0.0    0 11.8 26  10   M    M   2        31  20
20  65  47  56 -11   9   0 0.00  0.0    0 11.5 21  20   M    M   4        27  30
21  67  45  56 -10   9   0 0.00  0.0    0  9.2 16  10   M    M   2        21  20
22  75  46  61  -5   4   0 0.00  0.0    0  9.0 23 330   M    M   5        29 310
23  83  55  69   4   0   4 0.00  0.0    0  9.4 22 280   M    M   3        28 290
24  79  57  68   3   0   3 0.00  0.0    0  5.7 14 250   M    M   7        18 240
25  80  57  69   4   0   4 0.00  0.0    0  5.4 12 170   M    M   7 18     15 150
26  75  63  69   5   0   4    T  0.0    0  5.0 13 150   M    M   8 1      18 110
27  80  68  74  10   0   9 0.05  0.0    0  4.3 12 110   M    M   8 1      15 100
28  81  69  75  12   0  10 0.02  0.0    0  8.5 14 170   M    M   5 1      19 200
29  74  67  71   8   0   6 0.75  0.0    0  6.1 16 170   M    M   9 1      22 150
30  73  60  67   5   0   2 0.73  0.0    0 14.9 30 220   M    M   6 1      41 250
==============================================================================
SM 2328 1820        39 170  4.06     0.0 243.8          M      191
==============================================================================
AV 77.6 60.7                                8.1 FASTST   M    M   6    MAX(MPH)
                                 MISC ---->  # 30 220                # 41  250
==============================================================================
```

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20200901&edate=20201001&timezone=GMT&datum=MSL&interval=h&action=

ATTACHMENT B.4
Q4 2020 HYDRAULIC AND HYDRODYNAMIC EVALUATION SUMMARIES

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **October 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.59 Date: 10/29/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.851 Date: 10/30/2020 Time: 7:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.452 Date: 10/30/2020 Time: 13:00 Exceeds event trigger criteria? YES 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 30 Date: 10/7/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: SW OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

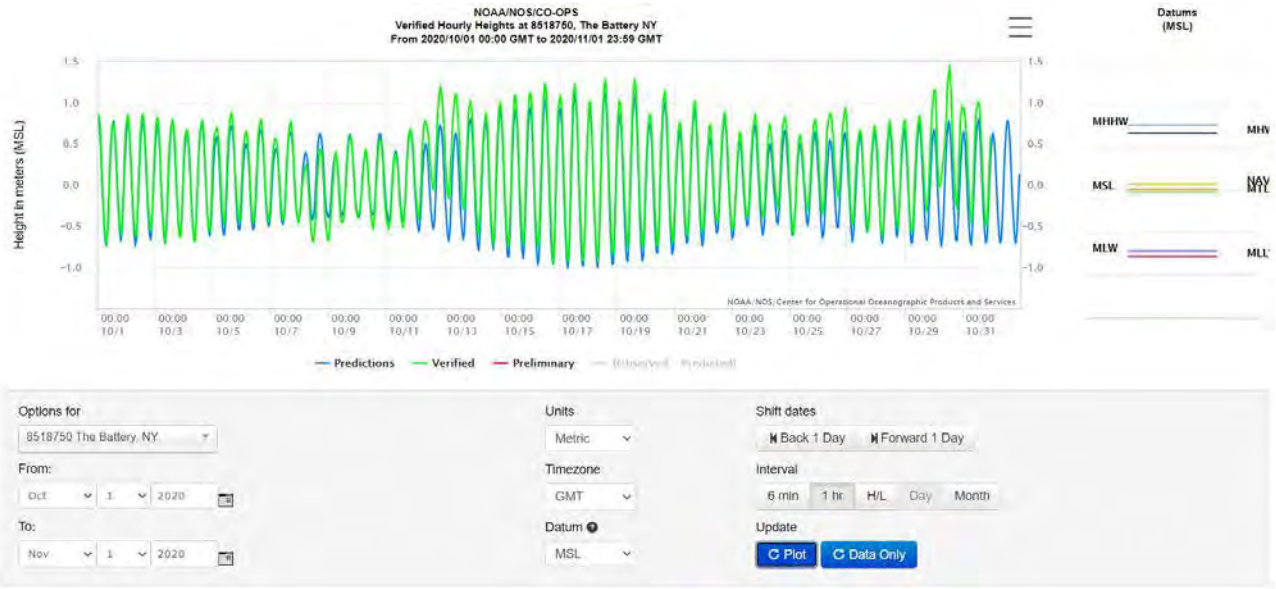
```
000
CXUS51 KOKX 021328
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                          STATION:   NEWARK NJ
                                          MONTH:     OCTOBER
                                          YEAR:      2020
                                          LATITUDE:   40 42 N
                                          LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
================================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                      12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
================================================================================

 1  73  55  64   2   1   0 0.02  0.0    0  9.0 18 240   M    M   5        22 240
 2  69  52  61  -1   4   0 0.01  0.0    0  7.7 18 280   M    M   7        23 290
 3  69  48  59  -2   6   0 0.00  0.0    0  6.7 14 280   M    M   1        21 280
 4  69  47  58  -3   7   0 0.00  0.0    0  6.0  8  80   M    M   5        14 100
 5  71  51  61   1   4   0 0.00  0.0    0  6.6 13 360   M    M   5        17 360
 6  71  50  61   1   4   0 0.00  0.0    0  6.9 18 240   M    M   2        25 250
 7  79  57  68   8   0   3    T  0.0    0 15.0 30 230   M    M   6        40 230
 8  68  51  60   1   5   0 0.00  0.0    0 13.8 26 310   M    M   2        34 310
 9  73  47  60   1   5   0 0.00  0.0    0  7.5 20 220   M    M   3        27 220
10  73  55  64   5   1   0 0.00  0.0    0 13.1 20 220   M    M   8        25 230
11  68  58  63   5   2   0 0.01  0.0    0  9.7 17  90   M    M   9        24 110
12  58  50  54  -4  11   0 0.79  0.0    0 13.8 24  50   M    M  10 1      32  50
13  61  53  57  -1   8   0 0.25  0.0    0 13.2 21  20   M    M   9 1      26  30
14  71  49  60   3   5   0 0.00  0.0    0  7.9 16 240   M    M   1        22 250
15  77  51  64   7   1   0 0.00  0.0    0  8.0 21 190   M    M   7        28 190
16  64  49  57   1   8   0 0.98  0.0    0  9.7 21 320   M    M   9 18     26 310
17  63  45  54  -2  11   0    T  0.0    0  8.0 15 300   M    M   3        23 320
18  65  39  52  -4  13   0 0.00  0.0    0  6.8 20 130   M    M   5        25 140
19  67  48  58   2   7   0 0.00  0.0    0  6.6 14 130   M    M   8        18 130
20  72  59  66  11   0   1 0.02  0.0    0  2.2  9 180   M    M   9 12     12 170
21  71  61  66  11   0   1    T  0.0    0  3.5  8 170   M    M   9 12     11 140
22  70  64  67  13   0   2 0.00  0.0    0  3.1  9  20   M    M  10 128    13  10
23  68  62  65  11   0   0    T  0.0    0  4.2  9 120   M    M  10 1      12 140
24  73  48  61   7   4   0 0.00  0.0    0  9.5 18 350   M    M   9        27 320
25  53  44  49  -5  16   0 0.04  0.0    0  9.1 17  10   M    M   8 1      22  30
26  58  48  53   0  12   0 0.07  0.0    0  6.5 13  50   M    M  10 12     17  50
27  61  54  58   5   7   0    T  0.0    0  5.8 16 310   M    M   8 12     19 310
28  58  50  54   1  11   0 0.08  0.0    0  4.9 12  10   M    M   8 1      14 260
29  56  47  52   0  13   0 1.59  0.0    0 11.5 26  30   M    M  10 1      33  30
30  47  36  42 -10  23   0 0.70    T    0 14.2 29  10   M    M   8 14     36  10
31  47  32  40 -12  25   0 0.00  0.0    0  5.8 12  10   M    M   3        15  40
================================================================================
SM 2043 1560       214   7  4.56    T    256.3          M      207
================================================================================
AV 65.9 50.3                                8.3 FASTST   M    M   7    MAX(MPH)
                                  MISC ----->  # 30 230               # 40  230
================================================================================
```

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20201001&edate=20201101&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **November 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 1.21 Date: 11/30/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 0.935 Date: 11/30/2020 Time: 19:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.331 Date: 11/15/2020 Time: 13:00 Exceeds event trigger criteria? NO 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 48 Date: 11/15/2020 Exceeds trigger criteria? YES Wind direction over 6-hr period: WSW OK Note: (1) The averaged wind speed for the 6-hour period during which the maximum wind speed was recorded does not exceed the threshold criteria.	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

```
000
CXUS51 KOKX 010702
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     NOVEMBER
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  55  38  47  -5  18   0 0.37  0.0    0 10.4 26 290   M    M   9 1      37 280
 2  47  38  43  -8  22   0 0.00  0.0    0 17.3 35 300   M    M   4        45 270
 3  56  38  47  -4  18   0 0.00  0.0    0 13.1 24 310   M    M   7        28 300
 4  65  36  51   0  14   0 0.00  0.0    0  6.4 13 190   M    M   1        16 200
 5  70  45  58   8   7   0 0.00  0.0    0  5.9 21 230   M    M   5 1      26 250
 6  73  49  61  11   4   0 0.00  0.0    0  7.9 18 230   M    M   5        22 250
 7  77  47  62  12   3   0 0.00  0.0    0  6.0 14 240   M    M   3        17 250
 8  77  46  62  13   3   0 0.00  0.0    0  1.7  7 200   M    M   2         7 120
 9  77  47  62  13   3   0 0.00  0.0    0  2.5  9 230   M    M   1 18     12 220
10  76  51  64  15   1   0 0.00  0.0    0  7.7 20 230   M    M   3 12     25 230
11  73  61  67  19   0   2 0.63  0.0    0  7.5 18 230   M    M   8 1      23 230
12  68  48  58  10   7   0 0.16  0.0    0 11.1 24 360   M    M   9 1      30 340
13  53  43  48   0  17   0 0.12  0.0    0  7.4 14  30   M    M   7 1      18 310
14  54  39  47   0  18   0 0.00  0.0    0  8.4 18 330   M    M   2        24 320
15  65  34  50   3  15   0 0.07  0.0    0 13.1 48 250   M    M   7 13     59 250
16  55  40  48   1  17   0 0.00  0.0    0 13.4 28 270   M    M   1        36 280
17  50  34  42  -4  23   0    T    M    0 10.2 25 320   M    M   6        34 300
18  38  29  34 -12  31   0 0.00  0.0    0 14.1 26 340   M    M   3        33 330
19  49  26  38  -8  27   0 0.00  0.0    0  9.7 20 210   M    M   6        27 210
20  64  40  52   7  13   0 0.00  0.0    0 10.9 18 230   M    M   4        23 250
21  66  45  56  11   9   0 0.00  0.0    0  9.2 16  20   M    M   7        22 310
22  59  43  51   6  14   0    T  0.0    0 11.1 18  20   M    M  10        25 110
23  59  41  50   6  15   0 0.46  0.0    0 12.2 31 320   M    M   6 1      43 310
24  50  40  45   1  20   0 0.00  0.0    0  8.5 18 330   M    M   6        25 330
25  54  43  49   5  16   0    T  0.0    0  5.9 20 210   M    M   9        25 220
26  66  48  57  14   8   0 0.65  0.0    0  7.2 21 250   M    M   8 1      25 250
27  64  45  55  12  10   0 0.00  0.0    0  4.8 14 270   M    M   5        16 270
28  58  41  50   8  15   0    T  0.0    0  7.6 21 270   M    M   4        28 270
29  55  35  45   3  20   0 0.00  0.0    0  5.0 15 250   M    M   3        16 220
30  65  43  54  12  11   0 1.21  0.0    0 12.1 29 140   M    M  10 13     46 160
==============================================================================
SM 1838 1253       399   2  3.67     0.0 268.3          M      161
==============================================================================
AV 61.3 41.8                              8.9 FASTST   M    M   5    MAX(MPH)
                                MISC ---->  # 48 250                # 59  250
==============================================================================
```

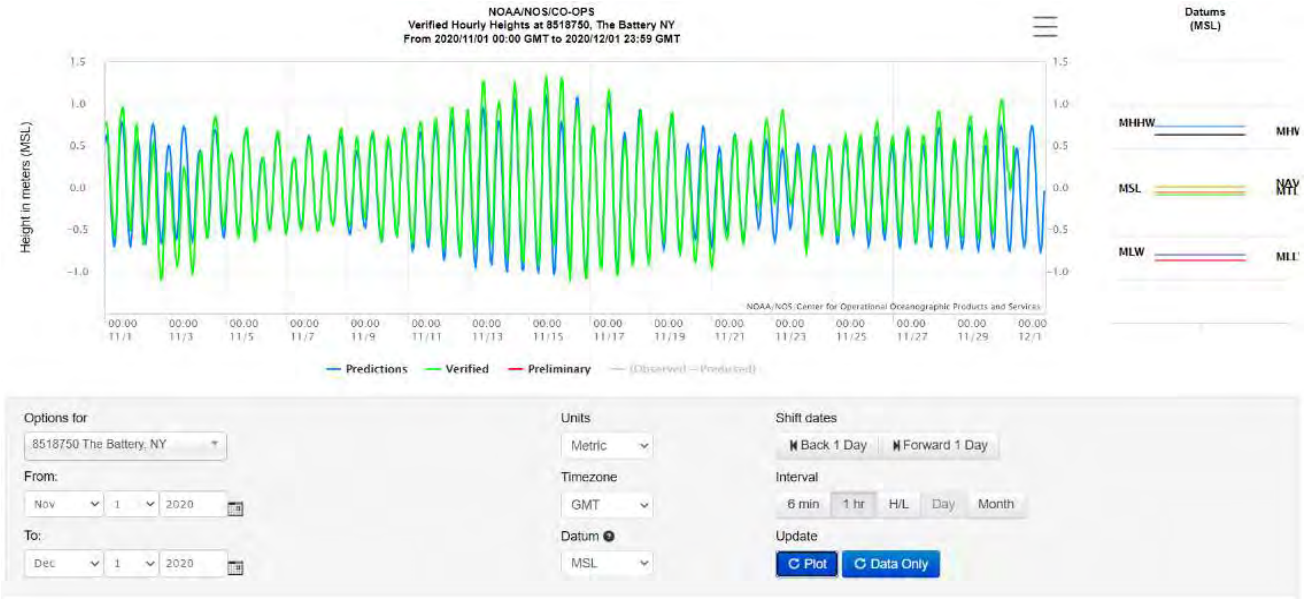
https://w2.weather.gov/climate/index.php?wfo=okx

Daily Observations

Time	Temperature	Dew Point	Humidity	Wind	Wind Speed	Wind Gust	Pressure	Precip.	Condition
3:51 PM	58 °F	49 °F	72 %	SE	13 mph	22 mph	29.83 in	0.0 in	Cloudy
4:51 PM	60 °F	52 °F	75 %	S	14 mph	0 mph	29.79 in	0.0 in	Cloudy
5:51 PM	62 °F	54 °F	75 %	S	20 mph	30 mph	29.72 in	0.0 in	Light Rain
6:51 PM	64 °F	55 °F	72 %	S	21 mph	37 mph	29.65 in	0.0 in	Cloudy / Windy
7:51 PM	64 °F	57 °F	78 %	S	29 mph	43 mph	29.62 in	0.0 in	Light Rain / Windy
8:24 PM	65 °F	57 °F	75 %	SSW	31 mph	49 mph	29.62 in	0.0 in	Light Rain with Thunc
8:31 PM	59 °F	54 °F	83 %	WSW	46 mph	60 mph	29.68 in	0.0 in	Heavy T-Storm / Winc
8:43 PM	56 °F	52 °F	87 %	WNW	32 mph	49 mph	29.69 in	0.1 in	Rain / Windy
8:51 PM	56 °F	50 °F	80 %	W	26 mph	39 mph	29.69 in	0.1 in	Light Rain / Windy
9:51 PM	55 °F	44 °F	67 %	WSW	18 mph	24 mph	29.73 in	0.0 in	Light Rain
10:51 PM	54 °F	43 °F	66 %	W	13 mph	0 mph	29.73 in	0.0 in	Light Rain
11:51 PM	55 °F	38 °F	53 %	W	20 mph	28 mph	29.76 in	0.0 in	Cloudy

Averaged wind speed over the 6-hour period = 26 mph

https://www.wunderground.com/history/daily/us/nj/newark/KEWR/date/2020-11-15



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20201101&edate=20201201&timezone=GMT&datum=MSL&interval=h&action=

SA-7 Sediment Remedy
Long-Term Monitoring Program
Hydrologic Data Review

Monitoring Period: **December 2020**	*Assessment Required?*
Rainfall Event Data: Max Rainfall (in): 0.97 Date: 12/5/2020 50-Year, 24-Hr event? NO	NO
Storm Surge Event Data: Max Increase Above Predicted Normal Tidal Cycling (m): 1.173 Date: 12/17/2020 Time: 8:00 Exceeds event trigger criteria? YES Max Tide Gauge Reading (m): 1.506 Date: 12/17/2020 Time: 16:00 Exceeds event trigger criteria? YES 10-year storm surge event defined as a hurricane? NO	NO
Wind Event Data: Max Wind (mph): 38 Date: 12/17/2020 Exceeds trigger criteria? NO Wind direction over 6-hr period: N OK	NO

CRITERIA FROM LTMP:

"Post-High Energy Event Monitoring Activities" will take place promptly following High Energy Events. The Consent Order defines "High Energy Events" as follows:

i. "A 50-year rainfall event defined by the National Weather Service as a 24-hour period of rainfall exceeding the maximum 50-year/24-hour accumulation (i.e., 7.2 inches of rainfall over a 24-hour period), as recorded at Newark Airport;

- See https://w2.weather.gov/climate/index.php?wfo=okx

ii. A 10-year storm surge event defined as a hurricane event (not a "nor'easter") resulting in an increase in ocean level of either 0.64 meters above normal tidal cycling at the Battery Park tide gauge or 1.40 meters above mean sea level (MSL); or

- Note: Hurricane events are defined by NOAA.
- See http://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750

iii. A wind event achieving 34 to 40 knots (39.13 to 46.03 mph), coming from the south through the west, averaged over 6 hours, as recorded at Newark Airport."

- https://w2.weather.gov/climate/index.php?wfo=okx

CHECKED BY: TEA

National Weather Service - Climate Data - Microsoft Edge

https://w2.weather.gov/climate/getclimate.php?wfo=okx

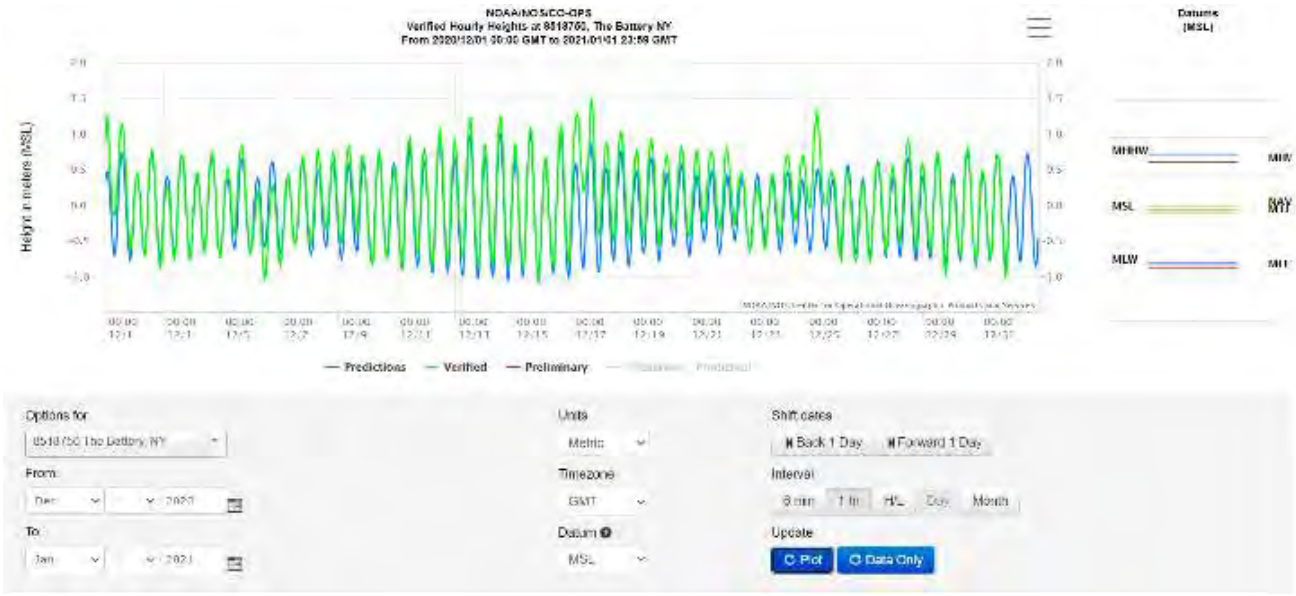
```
495
CXUS51 KOKX 011010
CF6EWR
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   NEWARK NJ
                                        MONTH:     DECEMBER
                                        YEAR:      2020
                                        LATITUDE:   40 42 N
                                        LONGITUDE:  74 10 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
==============================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                    12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
==============================================================================

 1  59  37  48   7  17   0    T  0.0    0 15.0 30 230   M    M   7        38 240
 2  44  34  39  -2  26   0 0.00  0.0    0 14.9 25 280   M    M   6        34 250
 3  50  30  40  -1  25   0    T  0.0    0 10.2 18 230   M    M   5        23 250
 4  52  38  45   5  20   0 0.12  0.0    0  8.0 17 220   M    M   8 1      23 190
 5  48  38  43   3  22   0 0.97  0.0    0 16.6 30 310   M    M   8 1      37 300
 6  42  32  37  -3  28   0 0.00  0.0    0 15.5 30 290   M    M   4        37 320
 7  42  26  34  -5  31   0 0.00  0.0    0  7.8 17 360   M    M   4        22 360
 8  39  30  35  -4  30   0    T    T    0 11.6 22 330   M    M   7        29 310
 9  38  27  33  -5  32   0 0.06  0.5    0 10.0 21 230   M    M   8 18     25 240
10  50  33  42   4  23   0 0.00  0.0    T  9.1 25 300   M    M   2 18     30 310
11  58  32  45   7  20   0 0.00  0.0    0  5.0 14 200   M    M   6 8      19 190
12  53  39  46   8  19   0 0.00  0.0    0  3.2  9  10   M    M   8 18     10  30
13  62  42  52  15  13   0 0.00  0.0    0  7.9 23 260   M    M   7        30 260
14  46  35  41   4  24   0 0.28  0.0    0  8.3 25 300   M    M   8 1      33 310
15  41  28  35  -2  30   0 0.00  0.0    0 11.9 21 330   M    M   5        25 300
16  32  24  28  -8  37   0 0.39  5.5    0 16.2 28  40   M    M   9 149    35  50
17  33  24  29  -7  36   0 0.58  5.9   11 17.4 38 360   M    M   7 49     47 360
18  33  20  27  -9  38   0 0.00  0.0    7  9.7 16 350   M    M   6        22 330
19  32  16  24 -11  41   0 0.00  0.0    7  5.3 13 340   M    M   6        16 360
20  38  28  33  -2  32   0 0.01    T    7  1.3  7 130   M    M  10 1      11 150
21  47  36  42   7  23   0 0.00  0.0    5  5.2 16 230   M    M   9 18     21 250
22  47  35  41   6  24   0    T  0.0    2 10.9 28 290   M    M   8 18     35 280
23  44  35  40   6  25   0 0.00  0.0    T  6.9 21 280   M    M   6        26 300
24  60  37  49  15  16   0 0.43  0.0    0 11.9 32 140   M    M   9 1      46 130
25  62  28  45  11  20   0 0.66  0.0    0 18.4 35 160   M    M  10 1      51 150
26  33  24  29  -5  36   0 0.00  0.0    0 16.4 25 260   M    M   4        32 270
27  39  23  31  -2  34   0 0.00  0.0    0  6.0 12 240   M    M   4        14 260
28  52  32  42   9  23   0    T  0.0    0  7.4 16 230   M    M   6        20 230
29  41  29  35   2  30   0 0.00  0.0    0 12.0 26 320   M    M   4        34 330
30  42  26  34   1  31   0 0.00  0.0    0  7.9 20 200   M    M   8        26 220
31  48  32  40   7  25   0 0.60  0.0    0  9.5 21 220   M    M   9 1      26 220
==============================================================================
SM 1407  950       831   0  4.10 11.9    317.4          M      208
==============================================================================
AV 45.4 30.6                              10.2 FASTST   M    M   7    MAX(MPH)
                                  MISC ---->    38 360                51 150
==============================================================================
```

https://w2.weather.gov/climate/index.php?wfo=okx



https://tidesandcurrents.noaa.gov/waterlevels.html?id=8518750&units=metric&bdate=20201201&edate=20210101&timezone=GMT&datum=MSL&interval=h&action=