TAMPA BAY NUTRIENT MANAGEMENT STRATEGY
2022 REASONABLE ASSURANCE UPDATE

The Tampa Bay Estuary Program (TBEP) and the Tampa Bay Nitrogen Management Consortium (NMC) submitted the "Tampa Bay Watershed Management Summary" to the Florida Department of Environmental Protection (FDEP) on July 29, 2002. The purpose of that document (called the "2002 Tampa Bay Reasonable Assurance Document") was to summarize the nitrogen management plan developed by the TBEP for Tampa Bay and to outline the underlying scientific basis for the plan. The document was formatted to facilitate its use in demonstrating reasonable assurance that designated uses of waterbody segments within the Tampa Bay basin, which were determined potentially impaired for nutrients pursuant to Chapter 62-303, F.A.C., will be maintained or restored. The document also provided a basis for establishment of alternative site-specific thresholds that more accurately reflect conditions beyond which an imbalance of flora and fauna may occur.

In November 2002, the FDEP Bureau of Watershed Management concluded that the "nitrogen management plan developed by TBEP for Tampa Bay provides reasonable assurance that impairment of designated uses related to nutrients in Tampa Bay will be adequately addressed."

Subsequent to the 2002 effort, both a 2007 Reasonable Assurance Update and 2009 Reasonable Assurance Addendum were prepared for FDEP to ensure that the original 2002 determination would be extended until 2012. The 2007 Tampa Bay Update to Reasonable Assurance Documentation and 2009 Addendum were intended to: 1) provide an update on implementation of the Tampa Bay Nitrogen Management Strategy to FDEP for the 2003-2007 period; 2) provide adequate documentation to allow FDEP a finding of Reasonable Progress pursuant to rule 62-303.600, F.A.C. for the 2003-2007 period; and, 3) provide TN loading allocations to categories of nitrogen sources by major bay segment, and facility-specific and MS4 specific allocations within each major bay segment, to support any FDEP water quality based effluent limitation, FDEP Reasonable Assurance determination, and to comply with the federally-recognized TMDL for Tampa Bay. Subsequent Reasonable Assurance Updates were submitted in 2012 and 2017 to the FDEP to extend the Reasonable Assurance determination through 2021. As of the 2017 Reasonable Assurance Update, FDEP concluded that "all segments covered by the RA (plan) will be placed in assessment category 2b for total nitrogen. This assessment category identifies the segments as not impaired and attaining their designated uses."

The format of this 2022 Reasonable Assurance (RA) Update follows that provided in the draft "Guidance for Development of Documentation to Provide Reasonable Assurance that Proposed Pollution Control Mechanisms will Result in the Restoration of Designated Uses in Impaired Waters" provided by FDEP in February 2002. For each element, updated 2022 Reasonable Assurance documentation is integrated with any relevant documentation detailed in the 2002, 2007, 2009, 2012, and 2017 RA submittals.

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1. Description of the Waterbody

2022 RA Update: The Tampa Bay estuary is located on the eastern shore of the Gulf of Mexico in Florida (Figure 1). At 882 km^2, it is Florida's largest open water estuary. More than 3 million people live in the 5870 km^2 watershed. Land use in the watershed is mixed, with about 32% of the watershed undeveloped, 17% agricultural, 42% urban and suburban residential, and the remaining 9% mining. Major habitats in the Tampa Bay estuary include mangroves, salt marshes, salt barrens and submerged aquatic vegetation.

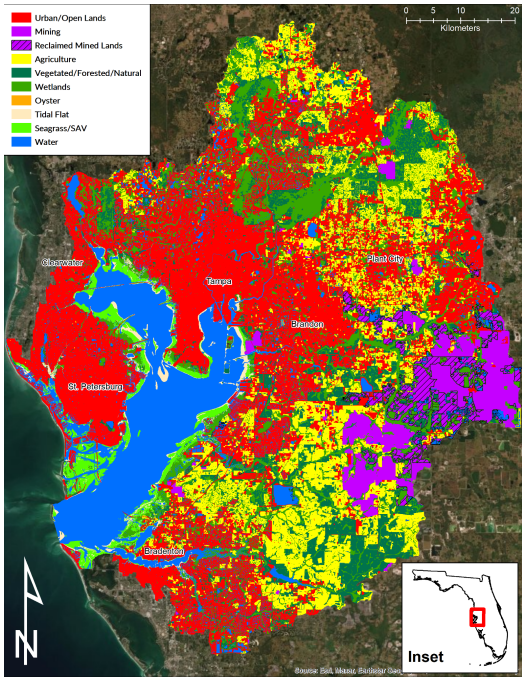

Figure 1. Tampa Bay watershed with 2020 SWFWMD Land Use/Land Cover.

Between 1950 and 1988, an estimated 42% of the seagrass acreage in Tampa Bay was lost primarily through excess nitrogen loading and related increases in phytoplankton concentrations, causing light limitation for seagrass survival and growth. In 1980, all municipal wastewater treatment plants were required to provide 100% reuse or Advanced Wastewater Treatment (AWT) for discharges directly to the bay and its tributaries. In addition to the significant reductions in nitrogen loadings from municipal wastewater treatment plant upgrades, stormwater regulations enacted in the 1980s also resulted in reduced nitrogen loads to the bay. The 1976 TN loadings are more than 3.0 times greater than current estimates (2017-2021 annual average, 1976 = 9904 tons TN, 2017-2021 = 3273 tons TN).

A key focus of the TBEP has been to establish nitrogen loading targets for Tampa Bay to encourage seagrass recovery. In 1996, the Tampa Bay Nitrogen Management Consortium (NMC) was formed. The NMC includes local governments and agencies participating in the TBEP, as well as phosphate companies, port industries, electric utilities and agricultural interests in the Tampa Bay watershed. These entities have pledged to work cooperatively in a voluntary, ad-hoc framework to assist with the maintenance of nitrogen loads to support seagrass restoration in Tampa Bay. Also, in 1996, local government and agency partners in the TBEP approved a long-term goal to restore 95% of the seagrass coverage observed in 1950 (38,000 acres). In 2020, the TBEP and its partners updated the Habitat Master Plan for Tampa Bay, adopting a new goal of maintaining at least 40,000 acres of seagrass within the bay.

Recent data and observations from Tampa Bay indicate that continuing efforts to reduce nitrogen loading by the NMC partners are resulting in water quality sufficient to maintain stable seagrasses in most bay segments. Time series plots show that FDEP-adopted chlorophyll-a thresholds have been met in three of four major bay segments over the 2017-2021 RA period, with the exception of the Old Tampa Bay segment which only met its threshold in 2018 (Figure 2). Based on FDEP finer-scale WBID assessments, additional exceedances in 2018 were also observed in Old Tampa Bay. The compliance assessment protocol established in the 2009 Reasonable Assurance Addendum dictates that a response to these exceedances is necessary, if they occurred in two concurrent years. As a result, the TBEP and Consortium participants have undertaken actions to address the exceedances observed in the Old Tampa Bay segment as described in Section 5.

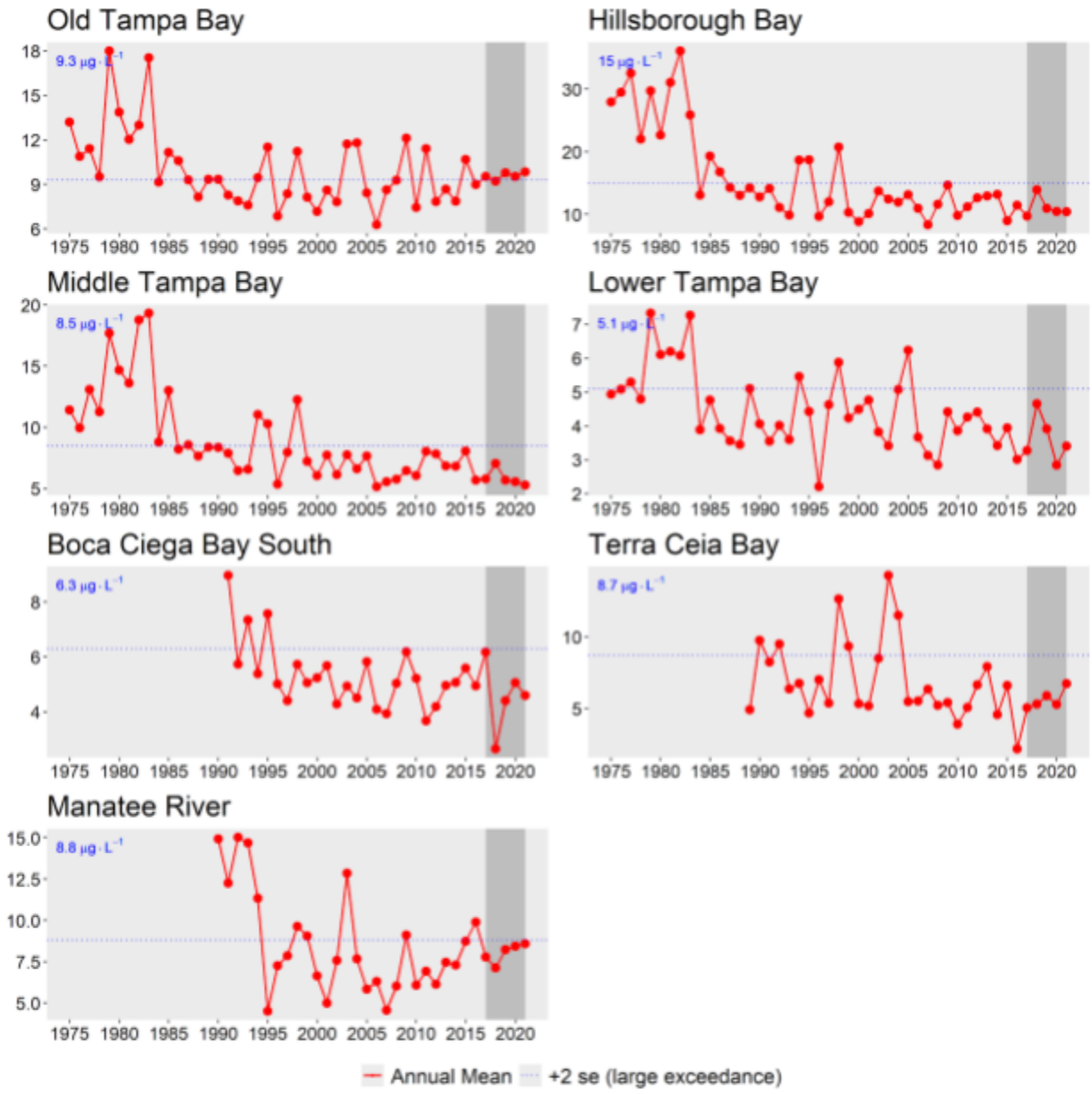

*Figure 2: Annual average chlorophyll-a concentration in each bay segment, 1974-2021. The dashed lines represent chlorophyll-a thresholds FDEP recognizes as **numeric nutrient criteria (indicators of impairment)** in each of the Tampa Bay segments and FDEP estuarine nutrient regions. Grey shaded area indicates the 2017-2021 Reasonable Assurance Period. Data source: Environmental Protection Commission of Hillsborough County (EPCHC), Pinellas County, and Manatee County.*

Between 2016 and 2022, seagrass coverage decreased by 11,518 acres. More than half of those losses have occurred in the Old Tampa Bay segment. Baywide seagrass coverage was estimated to be 30,137 acres in 2022 (Figure 3), remaining below the 40,000 acre protection and recovery goal for a second consecutive assessment period.

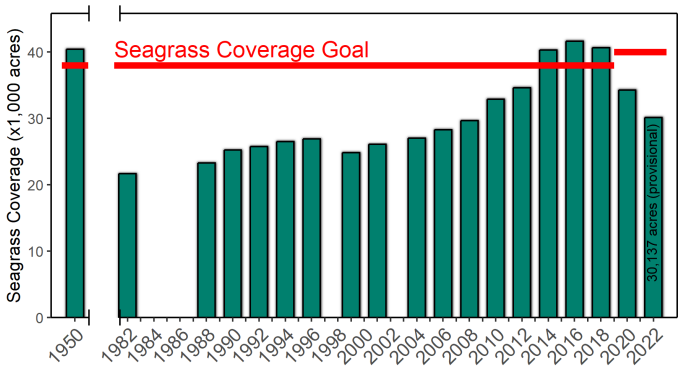

Figure 3 (right): Historic seagrass acreage estimates. Data source: TBEP & SWFWMD. 2022 data are provisional.

Historic seagrass changes in each bay segment shows the long-term increase until the baywide maximum in 2016 (Figure 4). Seagrass coverage declined in all segments during the 2017 -2021 RA period, with the largest declines in Old Tampa Bay and Hillsborough Bay. Seagrass coverage in Lower Tampa Bay and Boca Ciega Bay has been the most stable in recent years.

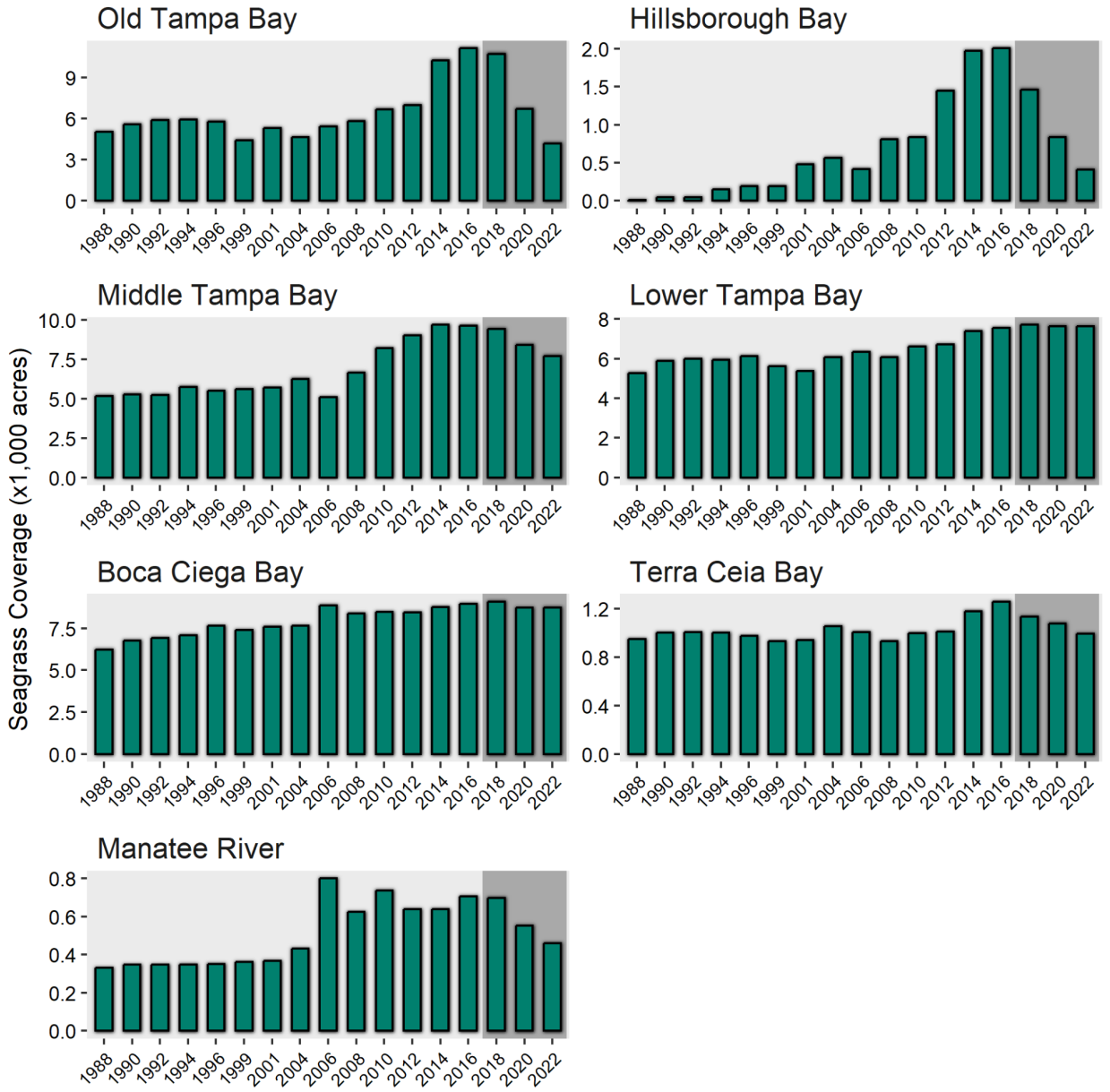

Figure 4: Historic seagrass acreage estimates in each bay segment. Grey shaded area indicates the 2017-2021 Reasonable Assurance Period.. Estimates for 2022 are provisional. Data source: TBEP & SWFWMD.

1.a. Name:

2022 RA Update: No change. This document addresses the four main bay segments of Tampa Bay: Old Tampa Bay, Hillsborough Bay, Middle Tampa Bay and Lower Tampa Bay. As of the 2009 RA Addendum, an additional segment was included: "Remainder of Lower Tampa Bay." This segment includes Terra Ceia Bay and portions of the Manatee River and southern Boca Ciega Bay. A cross-reference between these TBEP-identified management segments and FDEP WBID boundaries was previously provided in the 2009 RA Addendum (Appendix E-2 through E-10). Figure 5 depicts the overlap of the bay segment and FDEP WBIDs, as of the 2009 RA Addendum submittal. It should be noted that the Old Tampa Bay, Hillsborough Bay, Middle Tampa Bay and Lower Tampa Bay segments are identical to FDEP's established estuary nutrient regions. The Remainder of Lower Tampa Bay RA Segment includes FDEP's Boca Ciega Bay South, Terra Ceia Bay, and Manatee River Estuary nutrient regions, as per subsection 62-302.532(1), F.A.C.

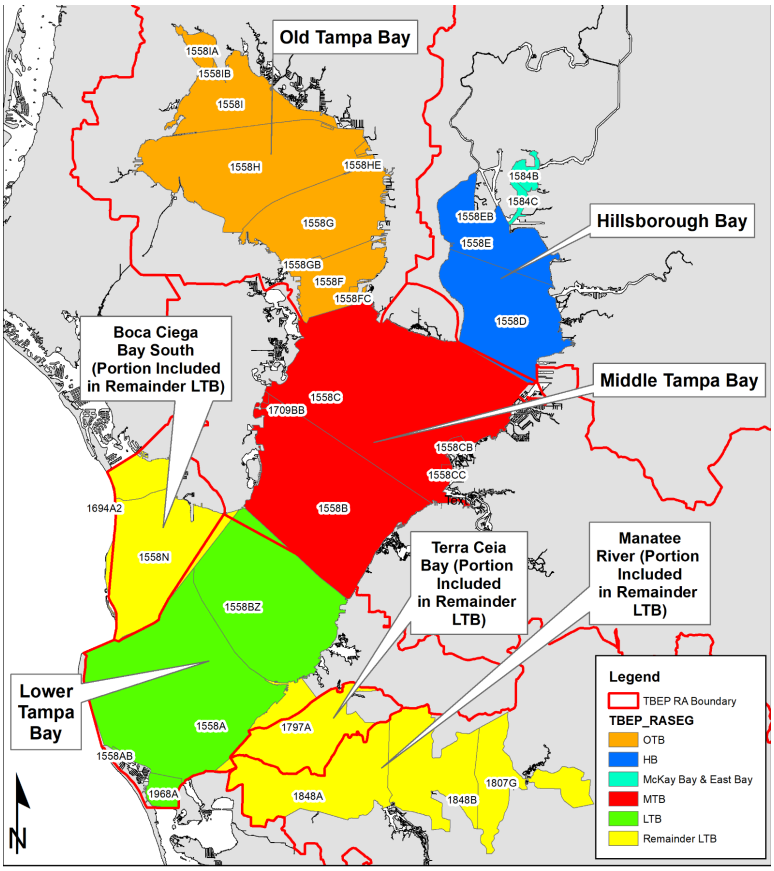

Figure 5: Map showing TBEP RA bay segment boundaries in relation to FDEP-defined WBIDs (IWR 64) contained in the major bay segment boundaries.

1.b. Location:

2022 RA Update: No change. Please refer to Figures 1 and 5.

1.c. Watershed/8-digit cataloging unit code:

2022 RA Update: No change. 03100206 Tampa Bay and coastal areas

1.d. Type (lake, stream or estuary) of water:

2022 RA Update: No change. Estuary.

1.e. Water use classification:

2022 RA Update: Class II and III waters. See rule 62-302.400, F.A.C.

1.f. Designated use of waterbody:

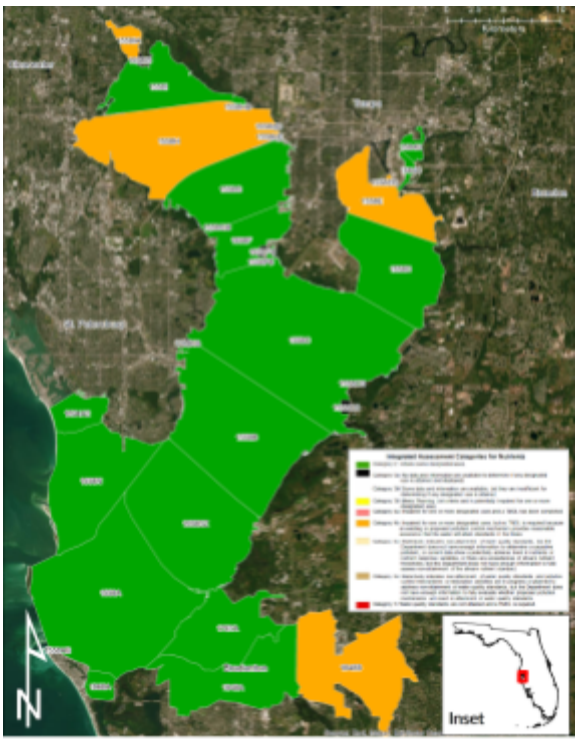

Figure 6. FDEP results of Florida's surface water quality assessment with focus on the Tampa Bay region: EPA assessment categories for nutrients. Source: FDEP.

2022 RA Update: No change. As per FDEP's latest 2022 303(d)/305(b) Integrated Water Quality Assessment Report for Florida and the 2020-2022 Biennial Assessment, WBIDs in Tampa Bay proper are identified as EPA Integrated Assessment Category 2 (attaining some designated uses) or 4b (impaired for one or more designated uses but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future) (Figure 6). Note that this document does not address impairments related to Class II shellfish harvesting areas in Tampa Bay.

1.g. Area of the waterbody:

2022 RA Update: No change. The total surface area of the four major bay segments in Tampa Bay is 882 km^2 (approximately 341 square miles). When including the Remainder of Lower Tampa Bay, the total surface area is 1006 km^2 (approximately 389 square miles).

1.h. Pollutant(s) of concern:

2022 RA Update: No change. The pollutant of concern has been identified as Total Nitrogen (TN), which has been determined to be the limiting nutrient in Tampa Bay. Elevated nitrogen loading has been demonstrated to lead to excess algal growth (as indicated by chlorophyll-a concentrations), which in turn leads to reduced light penetration and loss of seagrass in the bay.

1.i. Suspected or documented sources of pollutant of concern:

2022 RA Update: The TBEP has developed loading reports for Tampa Bay since 1985. The most recent estimates of TN loading to Tampa Bay are for the 2017-2021 time period. In general, total loadings to the bay are lower than they were in the 1985 - early 2000s period (Figure 7). Table 1 shows the proportion of major contributing sources of TN load to Tampa Bay over the current and prior, 5-year RA assessment periods. In addition, the per capita TN loading to the bay has decreased over time (Figure 8), and the amount of TN delivered per unit water has also decreased over time in each of the major bay segments (Figure 9). To date, hydrologically-normalized total loads to Tampa Bay are at the lowest levels since they have been estimated (1985) despite an increasing population in the Tampa Bay metropolitan area (Figure 10).

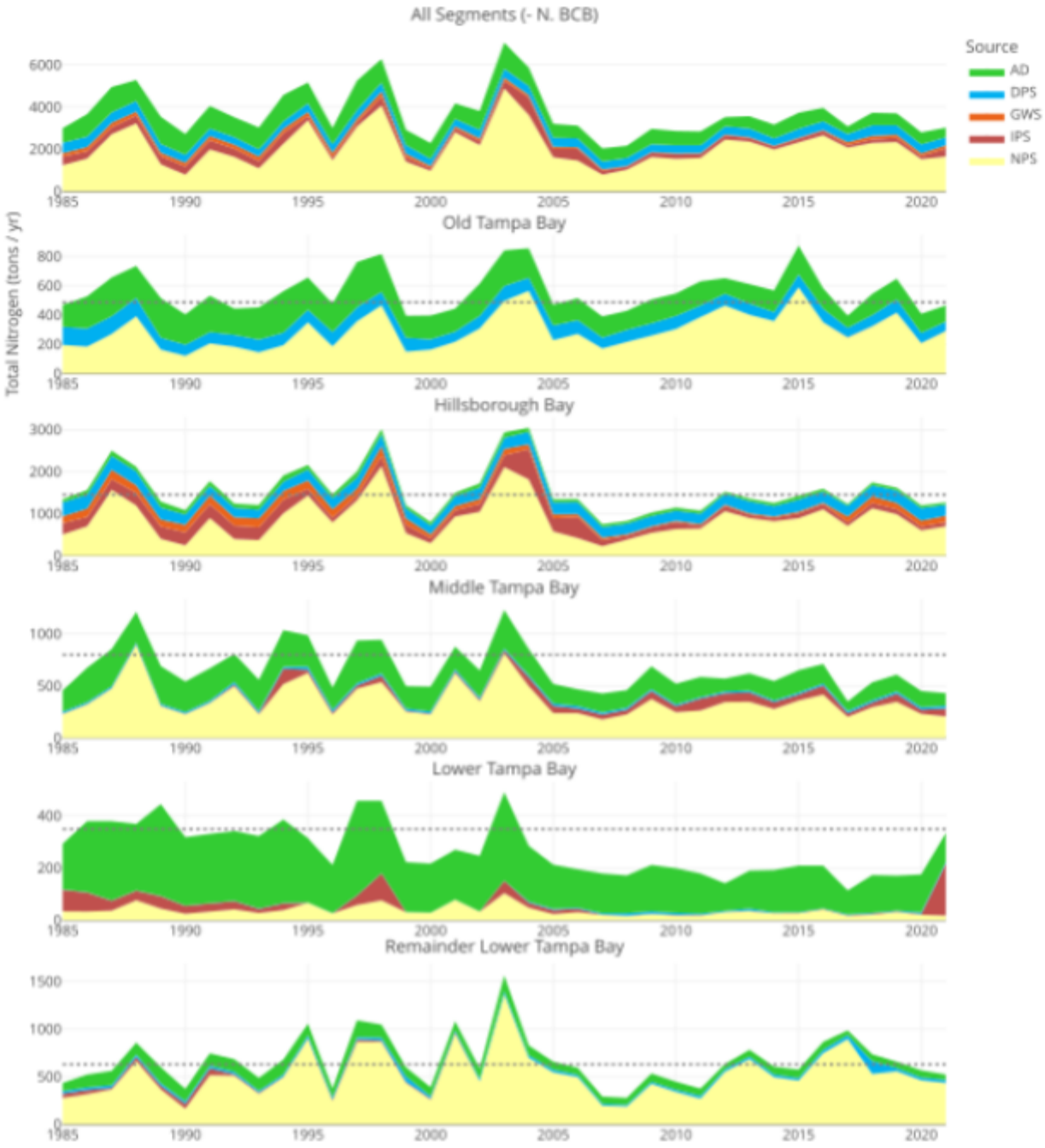

Figure 7. Total nitrogen loads to each Reasonable Assurance segment over the 1985-2021 period partitioned into the major source categories: atmospheric deposition (AD, green), domestic point sources (DPS, blue), groundwater and springs (GWS, orange), industrial point sources (IPS, red) and nonpoint sources (NPS, yellow). Dotted lines represent the federally-recognized total maximum daily loads.

Table 1. Summary of major TN loading sources (mean percentage contribution) estimated for the 5-year Tampa Bay RA periods.

Source	2002 RA	2007 RA Update	2012 RA Update	2017 RA Update	2022 RA Update
	1997-2001 (Mean %)	2002-2006 (Mean %)	2007-2011 (Mean %)	2012-2016 (Mean %)	2017-2021 (Mean %)
Stormwater	59.3	58.8	51.3	65.7	60.5
Direct Atmospheric Deposition	22.7	18.2	25.2	17.1	15.5
Domestic Wastewater	9.6	9.2	14.7	11.1	13.1
Industrial Wastewater	3.9	10.9	6.8	4.9	6.2
Industrial Fertilizer Losses	0.7	0.5	0.4	0.2	0.2
Groundwater and Springs	3.8	2.4	1.5	1.0	4.6

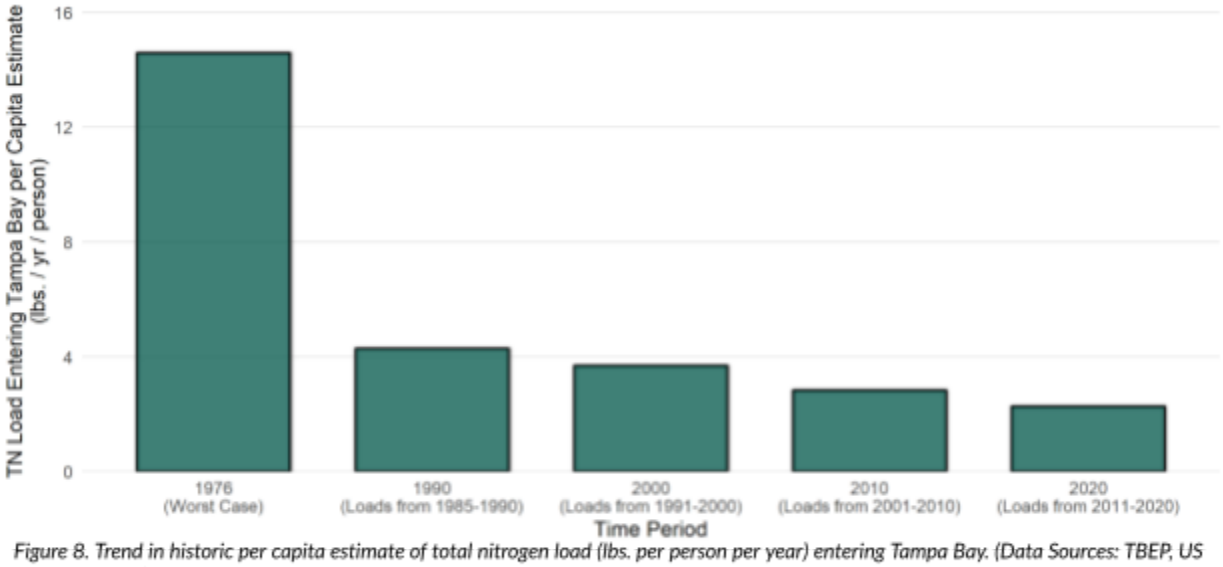

Figure 8. Trend in historic per capita estimate of total nitrogen load (lbs. per person per year) entering Tampa Bay. (Data Sources: TBEP, US Census Bureau).

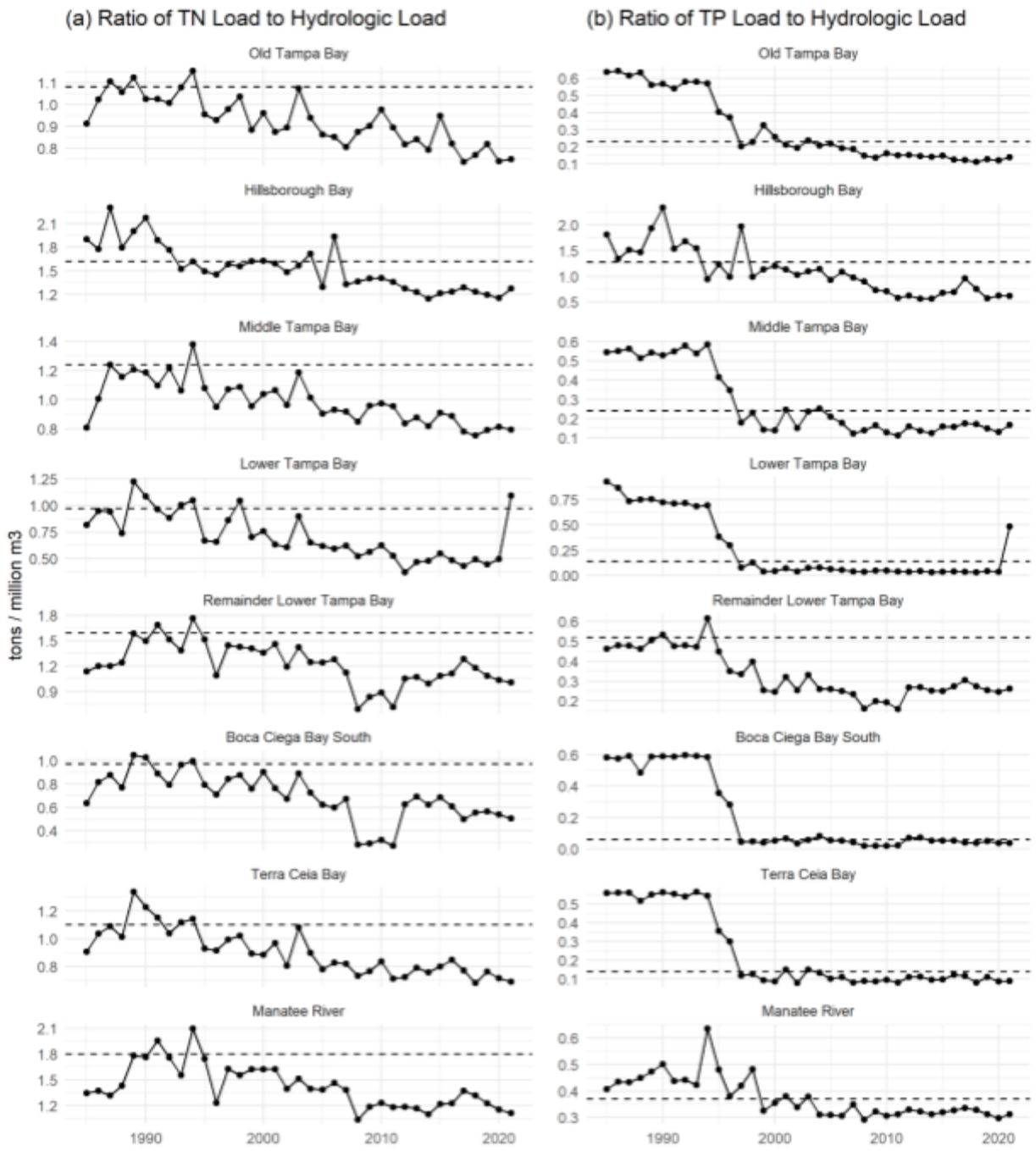

Figure 9. Nitrogen and phosphorus delivery ratios [i.e. total nitrogen or total phosphorus load (tons/yr) per unit water (million m3) delivered] to each of the major bay segments. The 1992-1994 ratio targets (black horizontal line) are highlighted for each bay segment and represent the arithmetic mean of those years. The 1992-1994 arithmetic mean ratio targets have been adopted by FDEP and accepted by EPA as the numeric nutrient criteria for the major bay segments. These bay segments have been established as FDEP Estuary Nutrient Regions. The Remainder Lower Tampa Bay segment is inclusive of the Boca Ciega Bay South, Terra Ceia Bay, and Manatee River segments. See Appendix 6 for tabular information on results in the figure.

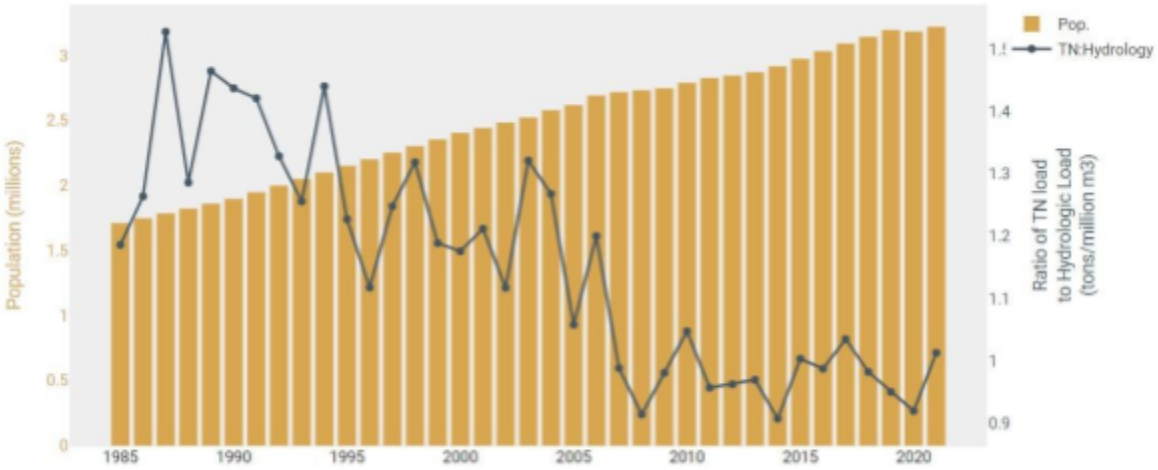

Figure 10. Trend in total nitrogen vs hydrology load to Tampa Bay relative to population increases in the Tampa Bay metropolitan area.

2. Description of Water Quality or Aquatic Ecological Goals

2.a. Water quality-based targets or aquatic ecological goals:

2022 RA Update: In 2020, TBEP updated the Habitat Master Plan and adopted a new seagrass restoration goal of maintaining at least 40,000 acres of seagrass throughout Tampa Bay. This represents a slight increase from the previous goal of 38,000 acres, which was based on estimates from a 1950s reference period. Bay managers revised the goal after 41,655 acres of seagrass were observed in 2016. Maintaining adequate water quality at adopted FDEP threshold levels for chlorophyll-a in each of the major bay segments on an annual average basis is the primary metric for assessing progress in maintaining the seagrass restoration goal. In addition, a secondary goal to maintain hydrologically-normalized total nitrogen loads to each of the major bay segments was adopted with the 2009 Reasonable Assurance Addendum. As a result, a compliance assessment framework was established for future reasonable assurance determinations (see 2009 RA Addendum Section VIII).

2.b. Averaging period:

2022 RA Update: No change. The TBEP uses annual average bay segment uncorrected chlorophyll-a levels for tracking attainment of water quality targets and thresholds, as approved by FDEP under the original 2001 RA submittal and later adopted in 2012 as NNC under subsection 62-302.532(1), F.A.C. for Old Tampa Bay, Hillsborough Bay, Middle Tampa Bay and Lower Tampa Bay (the same value is used for assessing the Remainder of LTB). An annual evaluation of TN loads is predicated on the water quality assessment as outlined in the compliance assessment framework identified above. Details on how the annual bay segment assessments are developed can be found here: https://tbep-tech.github.io/tbeptools/articles/intro.html. All source code for the analysis is located here: https://github.com/tbep-tech/wq-dash.

2.c. How will goals result in restoration of impaired designated uses:

2022 RA Update: No change. Maintaining chlorophyll-a concentrations at target levels is expected to result in the maintenance of water clarity adequate to support seagrass above 40,000 acres throughout Tampa Bay, thereby ensuring that nutrient loads do not result in an imbalance in the flora or fauna of Tampa Bay.

2.d. Determining whether additional corrective actions are needed:

2022 RA Update: No changes to the TBEP's annual management Decision Matrix process, the Tampa Bay NMC nutrient management strategy or allocation compliance assessment framework. Annual allocation compliance assessment protocols were established in the 2009 RA Addendum to determine whether additional corrective actions would be necessary in relation to bay segment specific nitrogen loadings. Results of the bay segment-specific compliance assessment over the 2017-2021 RA Period are described in Figure 11 and Tables 2 - 6. For the 2017-2021 RA period, three consecutive annual exceedances of the chlorophyll-a threshold occurred in the Old Tampa Bay (OTB) segment; however, hydrologically-normalized total nitrogen loads remained below the federally-recognized TMDL (Table 2) and the TN numeric nutrient criteria (Fig. 8) was not exceeded. Furthermore, TP numeric nutrient criteria

were also investigated and were not exceeded during the period (Fig. 8). As a result, an updated assimilative capacity assessment for this bay segment is recommended to be developed over the 2022-2026 RA Implementation Period in consultation with the TBNMC, FDEP and EPA.

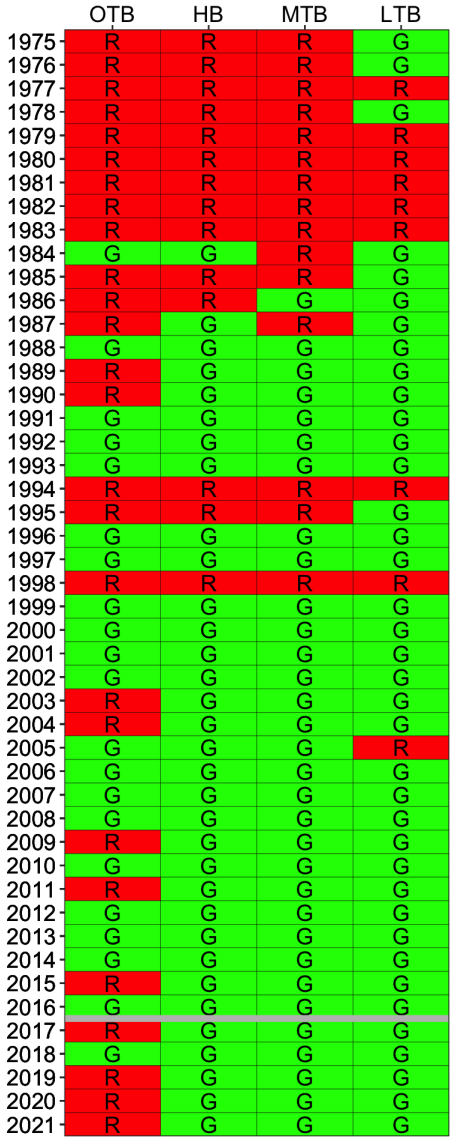

Figure 11: Attainment of adopted chlorophyll-a thresholds (1974- 2021) in the four major bay segments. Green indicates that average annual chlorophyll-a thresholds were met; red indicates that threshold levels were not met. Data source: EPCHC.

Table 2. Demonstration of reasonable assurance assessment steps for Old Tampa Bay. Green and red squares indicate outcomes of decision points outlined in the Consortium's reasonable assurance assessment framework.

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-a exceeds FDEP threshold of 9.3 ug/L	Yes (9.5)	No (9.2)	Yes (9.8)	Yes (9.5)	Yes (9.4)	First, third, fourth, and fifth years (2017, 2019, 2020, 2021) above threshold, proceed to NMC Action 2.
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years	No	No	No	Yes	Yes	Consecutive years with threshold exceedances occurred (2019- 2020, 2020-2021), proceed to NMC Action 3.
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 486 tons/year	No (332)	No (346)	No (369)	No (333)	No (337)	Further scrutinize loading data; Re-assess bay segment assimilative capacity
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						Bay segment load target met, but assimilative capacity may have changed. Entity allocation assessment provided as Appendix 1.

Table 3. Demonstration of reasonable assurance assessment steps for Hillsborough Bay. Green and red squares indicate outcomes of decision points outlined in the Consortium's reasonable assurance assessment framework.

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-a exceeds FDEP threshold of 15 ug/L	9.7 (No)	13.9 (No)	11 (No)	10.5 (No)	9.9 (No)	All years below threshold so far, not necessary for NMC Actions 2-5
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years	No	No	No	No	No	All years met threshold, not necessary for NMC Actions 3-5
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 1451 tons/year	N/A	N/A	N/A	N/A	N/A	Not necessary due to observed water quality and seagrass conditions in the bay segment
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						Not necessary when chlorophyll-*a* threshold met

Table 4. Demonstration of reasonable assurance assessment steps for Middle Tampa Bay. Green and red squares indicate outcomes of decision points outlined in the Consortium's reasonable assurance assessment framework.

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-a exceeds FDEP threshold of 8.5 ug/L	No (5.8)	No (7)	No (5.7)	No (5.5)	No (5)	All years below threshold so far, not necessary for NMC Actions 2-5
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years	No	No	No	No	No	All years met threshold, not necessary for NMC Actions 3-5
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 799 tons/year	N/A	N/A	N/A	N/A	N/A	Not necessary due to observed water quality and seagrass conditions in the bay segment
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						Not necessary when chlorophyll-*a* threshold met

Table 5. Demonstration of reasonable assurance assessment steps for Lower Tampa Bay. Green and red squares indicate outcomes of decision points outlined in the Consortium's reasonable assurance assessment framework.

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-a exceeds FDEP threshold of 5.1 ug/L	No (3.3)	No (4.7)	No (3.9)	No (2.8)	No (3.2)	All years below threshold so far, not necessary for NMC Actions 2-5
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years	No	No	No	No	No	All years met threshold, not necessary for NMC Actions 3-5
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 349 tons/year	N/A	N/A	N/A	N/A	N/A	Not necessary due to observed water quality and seagrass conditions in the bay segment
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						Not necessary when chlorophyll-*a* threshold met

Table 6. Demonstration of reasonable assurance assessment steps for the Remainder of Lower Tampa Bay segment (inclusive of Boca Ciega Bay South, Terra Ceia Bay and the Manatee River). Green and red squares indicate outcomes of decision points outlined in the Consortium's reasonable assurance assessment framework.

Bay Segment Reasonable Assurance Assessment Steps	DATA USED TO ASSESS ANNUAL REASONABLE ASSURANCE					OUTCOME
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	
NMC Action 1: Determine if observed chlorophyll-a exceeds FDEP threshold of 5.1 ug/L	No (3.3)	No (4.7)	No (3.9)	No (2.8)	No (3.2)	All years below threshold so far, not necessary for NMC Actions 2-5
NMC Action 2: Determine if any observed chlorophyll-*a* exceedances occurred for 2 consecutive years	No	No	No	No	No	All years met threshold, not necessary for NMC Actions 3-5
NMC Action 3: Determine if observed hydrologically-normalized total load exceeds federally-recognized TMDL of 629 tons/year	N/A	N/A	N/A	N/A	N/A	Not necessary due to observed water quality and seagrass conditions in the bay segment
NMC Actions 4-5: Determine if any entity/source/facility specific exceedances of 5-yr average allocation occurred during implementation period						Not necessary when chlorophyll-*a* threshold met

3. Description of Proposed Management Actions to be Undertaken

3.a. Participating Entities:

2022 RA Update: Members of the Tampa Bay Estuary Program Policy Board include the following:

- City of Tampa
- City of Clearwater
- City of St. Petersburg
- Manatee County
- Hillsborough County
- Pinellas County
- Pasco County
- Florida Dept. of Environmental Protection
- Southwest Florida Water Management District
- U.S. Environmental Protection Agency (Ex-officio)

The Tampa Bay Nitrogen Management Consortium includes participants from the following public and private entities:

2022 NMC Public Partners

- Tampa Bay Estuary Program
- U.S. Environmental Protection Agency
- Florida Department of Environmental Protection
- Florida Department of Agriculture & Consumer Services
- Florida Department of Transportation
- Southwest Florida Water Management District
- MacDill Air Force Base
- Tampa Bay Regional Planning Council
- Tampa Bay Water
- Tampa Port Authority
- Environmental Protection Commission of Hillsborough County
- Hillsborough County
- Manatee County
- Pasco County
- Pinellas County
- Polk County
- Sarasota County
- City of Bradenton
- City of Clearwater
- City of Gulfport
- City of Lakeland
- City of Largo
- City of Mulberry
- City of Oldsmar
- City of Palmetto
- City of Plant City
- City of Safety Harbor
- City of St. Petersburg
- City of Tampa

2022 NMC Private Partners

- Busch Entertainment
- ZooTampa
- Mosaic Company
- Tampa Port Services, LLC
- Kinder Morgan Bulk Terminals, Inc.
- HRK Holdings, Inc.
- Tampa Electric Company
- Duke Energy Florida, LLC
- CSX Transportation
- Tropicana Products, Inc.
- Kerry I&F Contracting
- Trademark Nitrogen
- Yara North America
- Alafia Preserve, LLC
- Eagle Ridge, LLC
- LDC Donaldson Knoll Investments, LLC

3.b. Existing and proposed management activities:

2022 RA Update: During the 2017-2021 RA implementation period, partners entered information on completed and planned TN load reduction projects into the on-line, Tampa Bay Action Plan Database (http://apdb.tbeptech.org). Consortium participants and regulators have direct access to input and view projects contained in the database. Various reporting tools are available online, and a GIS mapping interface for projects that contain location information is available (Figure 12). Over the 2017-2021 RA implementation period, 26 projects were implemented in the Tampa Bay watershed by Consortium participants. Cumulatively, for those projects that have load reduction estimates associated with them, a TN load reduction of 420.9 tons/year was estimated over the 2017-2021 period (Table 7). This amount would likely be larger if estimates were developed for all projects.

In addition, Consortium participants continue to look towards the future and have plans to implement or continue to implement a number of projects post-2021. Table 8 lists projects that are being continued by Consortium participants and include education components. Table 9 lists projects that are planned to be initiated/completed in specific years or are in progress of being completed during the 2022-2026 RA Implementation period. Combining information from both tables' projects where load reductions can be estimated, approximately 70.5 tons/year of TN is estimated to be precluded from entering the bay in the future.

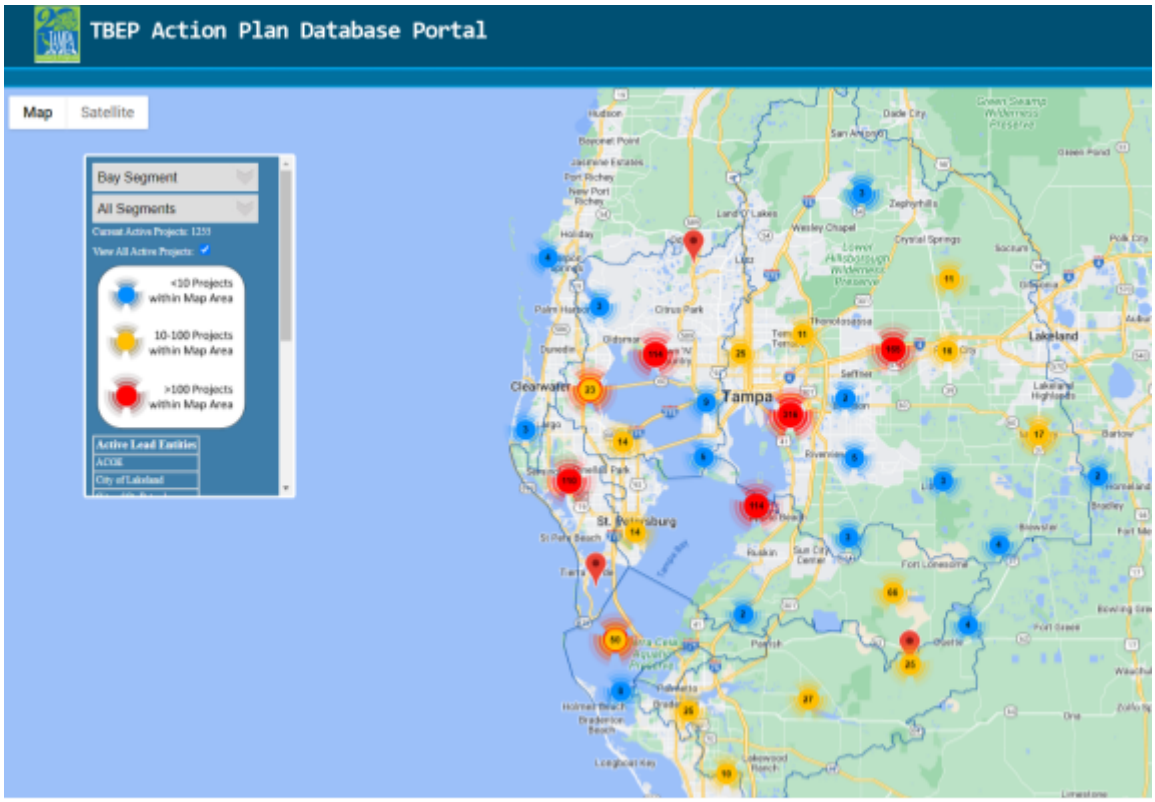

Figure 12: Screenshot of the online Tampa Bay Action Plan Database (http://apdb.tbeptech.org) showing the approximate spatial locations of projects implemented in the watershed from 1990 to date.

Table 7. Listing of completed load reduction projects included in the Tampa Bay Action Plan Database during the 2017-2021 RA Implementation Period (as of 12/21/2022).

Project ID	Project Name	Bay Segment	Lead Entity	Completion Date	TP (lbs./yr)	TN (lbs./yr)
484	Mobbly Bayou Wilderness Preserve Restoration	Old Tampa Bay	Pinellas County	2020	0	0
1248	Weedon Island Salt Marsh Restoration	Old Tampa Bay	Pinellas County	2020	0	0
1345	Cross Bayou Improvements	Old Tampa Bay	Pinellas County	2020	0	0
1383	Roosevelt Stormwater Ponds	Old Tampa Bay	Pinellas County	2020	0	157
1391	Pinellas Co. Pet Waste Ordinance	Old Tampa Bay	Pinellas County	2021	0	0
1392	Pinellas Co. Landscape Ordinance	Old Tampa Bay	Pinellas County	2021	0	0
1393	Pinellas Co. Adopt-A-Pond Program	Old Tampa Bay	Pinellas County	2021	0	0
1394	Tampa Bay Water Atlas	Old Tampa Bay	Pinellas County	2021	0	0
1451	Street Sweeping 2021	Old Tampa Bay	Pinellas County	2017-2021	568	1308
1428	ASR Well	Old Tampa Bay	City of Oldsmar	2019	683.2	2344.7
1452	Street Sweeping	Old Tampa Bay	City of Oldsmar	2021	0	0
				Old Tampa Bay Subtotal	**1251.2**	**3809.7**
1294, 1224, 1056	River Tower Park Shoreline Restoration and Stormwater Improvements	Hillsborough Bay	City of Tampa, SWFWMD, FDOT	2020	0	0
1429	Plant City Reuse at Mosaic Industries	Hillsborough Bay	City of Plant City	2019	0	527.8
				Hillsborough Bay Subtotal	**0**	**527.8**
1380	Street Sweeping Improved	Middle Tampa Bay	Pinellas County	2017-2021	36	56
1391	Pinellas Co. Pet Waste Ordinance	Middle Tampa Bay	Pinellas County	2021	0	0
1392	Pinellas Co. Landscape Ordinance	Middle Tampa Bay	Pinellas County	2021	0	0
1393	Pinellas Co. Adopt-A-Pond Program	Middle Tampa Bay	Pinellas County	2021	0	0
1394	Tampa Bay Water Atlas	Middle Tampa Bay	Pinellas County	2021	0	0
1413	Snell Isle & Rafael Blvds. NE	Middle Tampa Bay	City of St. Petersburg	2017	5.7	41.9
1419	34th Ave NE at Poplar St	Middle Tampa Bay	City of St. Petersburg	2018	0	0
1422	Crescent Lake at 14th Ave N	Middle Tampa Bay	City of St. Petersburg	2017	4.6	34.3
				Middle Tampa Bay Subtotal	**46.3**	**132.2**
1353	MARS Reclaimed Network Upgrades	Lower Tampa Bay	Manatee County	2020	0	0
1391	Pinellas Co. Pet Waste Ordinance	Lower Tampa Bay	Pinellas County	2021	0	0
1392	Pinellas Co. Landscape Ordinance	Lower Tampa Bay	Pinellas County	2021	0	0
1393	Pinellas Co. Adopt-A-Pond Program	Lower Tampa Bay	Pinellas County	2021	0	0
1394	Tampa Bay Water Atlas	Lower Tampa Bay	Pinellas County	2021	0	0
				Lower Tampa Bay Subtotal	**0**	**0**
1381	Street Sweeping Improved	Boca Ciega Bay	Pinellas County	2017-2021	699	1090
1382	Lake Seminole Alum Treatment Subbasin 2	Boca Ciega Bay	Pinellas County	2017	260	2663
1387	Long Branch Stormwater Pond Improvement BMP 6	Boca Ciega Bay	Pinellas County	2020	53	300
1391	Pinellas Co. Pet Waste Ordinance	Boca Ciega Bay	Pinellas County	2021	0	0
1392	Pinellas Co. Landscape Ordinance	Boca Ciega Bay	Pinellas County	2021	0	0
1393	Pinellas Co. Adopt-A-Pond Program	Boca Ciega Bay	Pinellas County	2021	0	0
1394	Tampa Bay Water Atlas	Boca Ciega Bay	Pinellas County	2021	0	0
1397	St. Joes Creek Stormwater Pond Improvement WQ	Boca Ciega Bay	Pinellas County	2020	251	1339
1398	Lake Seminole Sediment Removal	Boca Ciega Bay	Pinellas County	2021	154000	832000
1262	Manatee County SWWRF Upgrade	Manatee River	Manatee County	2017	0	0
1350	Deep Well Injection at NWRF	Manatee River	Manatee County	2021	0	0
1351	Deep Well Injection at SWWRF	Manatee River	Manatee County	2017	0	0
1454	Johnson Preserve	Manatee River	Manatee County	2021	0	0
				Remainder of Lower Tampa Bay Subtotal	**155263**	**837392**
				Tampa Bay Totals (lbs./yr)	**156560.5**	**841861.7**
				Tampa Bay Totals (tons/yr)	**78.3**	**420.9**

Table 8. Listing of ongoing and/or education projects submitted by Consortium participants into the online Tampa Bay Action Plan Database (http://apdb.tbeptech.org) that are anticipated to be continued during the 2022-2026 RA Implementation period.

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Implementation Period	Education Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
All Segments	SWFWMD	580	Water Resources Education Programs for Public Schools	Ongoing	Yes		$750,000
All Segments	SWFWMD	594	Virtual Watershed Excursion	Ongoing	Yes		
All Segments	SWFWMD	697	"Water Conservation: Reflect, Connect, Celebrate"	Complete	Yes		
All Segments	SWFWMD	824	Water Conservation Messaging	Ongoing	Yes		
All Segments	SWFWMD	837	Water Conservation Hotel and Motel Program (Water CHAMP)	Ongoing			
All Segments	SWFWMD	1426	Florida Water Star	Ongoing			
All Segments	Tampa Bay Water	821	Community Water-Wise Awards Program for Hillsborough, Pasco and Pinellas Counties	Ongoing			$35,000
All Segments	Tampa Bay Water	861	FL Friendly Landscape Program and Assistance with Irrigation-Landscape Ordinances	Ongoing			$456,854
All Segments	Tampa Bay Water	862	Landscape and Irrigation Permit and Code Enforcement Training Program	Ongoing	Yes		
All Segments	Tampa Bay Water	863	Smart Water Application Technologies Workshop and Training	Ongoing	Yes		$5,000
All Segments	Tampa Bay Water	867	Source Water Protection - Land Use and Development Review Program	Ongoing	Yes		$100,000
Old Tampa Bay	City of Clearwater	194	Continue support for FY&N	Ongoing	Yes		
Old Tampa Bay	City of Clearwater	195	Assist business with implementation of BMP's	Ongoing	Yes		
Old Tampa Bay	City of Clearwater	196	Promote use of BMP's on City-owned facilities	Ongoing	Yes		
Old Tampa Bay	City of Clearwater	198	Encourage alternative stormwater treatment methods	Ongoing	Yes		
Old Tampa Bay	City of Clearwater	203	Expansion of central sewer collection (septic tank elimination)	Ongoing			$10,000,000
Old Tampa Bay	City of Clearwater	210	Sewer System Evaluation Study and Self Audit Program	Ongoing			$2,800,000
Old Tampa Bay	City of Clearwater	116, 202	Development and implementation of a City-wide plan for expansion of reclaimed water service	Ongoing			
Old Tampa Bay	City of Largo	1357	Stormwater Education and Outreach	Ongoing	Yes		
Old Tampa Bay	City of Largo	1403	Street Sweeping – Long Branch & Allen's Creek	Ongoing		482.6	
Old Tampa Bay	City of Largo	1406	Promote use of BMPS on City-Owned Facilities	Ongoing			
Old Tampa Bay	City of Largo	1407	Require Water Quality Treatment for All New Development	Ongoing			
Old Tampa Bay	City of Safety Harbor	1371	Street Sweeping	Ongoing		180.6	$45,000
Old Tampa Bay	City of St. Petersburg	1309	Street Sweeping - Old Tampa Bay	Ongoing		136	
Old Tampa Bay	City of St. Petersburg	369, 468	Expand and Improve Reclaimed Water System	Ongoing			
Old Tampa Bay	City of Tampa	148	Continue support for Florida Yards & Neighborhoods and similar pollution prevention programs.	Ongoing	Yes		
Old Tampa Bay	City of Tampa	161	Expand Central Sewer Service to areas served by septic systems	Ongoing			
Old Tampa Bay	City of Tampa	974	Reduce Occurrences of Municipal Sewer Overflows to Tampa Bay	Ongoing			
Old Tampa Bay	City of Tampa	1017	Bacteria at Ben T. Davis Beach	Ongoing			

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Imple-mentation Period	Edu-cation Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Old Tampa Bay	City of Tampa	1304	Annual Street Sweeping Maintenance BMP	Ongoing			$175,000
Old Tampa Bay	Hillsborough County	284	Continue support for Florida Yards & Neighborhoods and similar pollution prevention programs.	Ongoing	Yes		$6,000
Old Tampa Bay	Hillsborough County	570	Hillsborough County Adopt-A-Pond	Ongoing	Yes		
Old Tampa Bay	Pinellas County	69	FY & N Florida Schoolyard Program	Ongoing	Yes		
Old Tampa Bay	Pinellas County	70	Florida Yards & Neighborhoods Program	Ongoing	Yes		
Old Tampa Bay	Pinellas County	71	FY & N Concepts For County Buildings And Lands	Ongoing	Yes		
Old Tampa Bay	Pinellas County	331	Florida Yards & Neighborhoods (FY&N) and similar pollution prevention programs	Ongoing	Yes		
Old Tampa Bay	Pinellas County	332	Training in Green Industries BMPs	Ongoing	Yes		
Old Tampa Bay	Pinellas County	333	FY&N classes, Water-Wise Awards and Workshops	Ongoing	Yes		
Old Tampa Bay	Pinellas County	340	Expand sewer service to septic tank users in selected areas	Ongoing			
Old Tampa Bay	Pinellas County	831	Brooker Creek Exhibits	Ongoing	Yes		
Old Tampa Bay	Pinellas County	1379	Street Sweeping Improved	Ongoing		886	
Old Tampa Bay	Pinellas County	1390	Pinellas Co Fertilizer Ordinance	Ongoing	Yes		
Old Tampa Bay	Pinellas County	1391	Pinellas Co. Pet Waste Ordinance	Ongoing	Yes		
Old Tampa Bay	Pinellas County	1392	Pinellas Co. Landscape Ordinance	Ongoing	Yes		
Old Tampa Bay	Pinellas County	1393	Pinellas Co. Adopt-A-Pond Program	Ongoing	Yes		
Old Tampa Bay	Pinellas County	1394	Tampa Bay Water Atlas	Ongoing	Yes		
Old Tampa Bay	SWFWMD	820	Lake Tarpon - SWIM Plan Implementation	Ongoing			$16,000
Old Tampa Bay	SWFWMD	832	Brooker Creek Watershed Education	Ongoing	Yes		
Old Tampa Bay	SWFWMD	836	Starkey Park Exhibits	Ongoing	Yes		
Old Tampa Bay, Hillsborough Bay	Hillsborough County	1313	Street Sweeping – Total for County	Ongoing		1958	$375,000
Hillsborough Bay	City of Lakeland	1060	Lakeland Water to TECO	Ongoing			$75,000
Hillsborough Bay	City of Lakeland	1082	Septic Tank Abandonment or Connection to Sanitary Sewer	Ongoing			
Hillsborough Bay	City of Plant City	1164	Dog Waste Signs	Ongoing	Yes		$900
Hillsborough Bay	City of Plant City	1275	City of Plant City Environmental Education Program	Ongoing	Yes		
Hillsborough Bay	City of Plant City	1284	Plant City Stormwater Inlet Marking Program	Ongoing	Yes		
Hillsborough Bay	City of Plant City	1285	Plant City Lift Station Auxiliary Power Program	Ongoing			
Hillsborough Bay	City of Plant City	1286	Plant City Lift Station Maintenance	Ongoing			
Hillsborough Bay	City of Plant City	1287	Plant City Lift Station Security Program	Ongoing			
Hillsborough Bay	City of Plant City	1288	Plant City Grease Management Program	Ongoing			
Hillsborough Bay	City of Plant City	1289	Plant City Inflow and Infiltration (I&I) Program	Ongoing			
Hillsborough Bay	City of Plant City	1290	Lake Thonotosassa Diagnostic Assessment and Water Quality Treatment Project	Ongoing			
Hillsborough Bay	City of Plant City	1291	Plant City Spill Prevention/Response Program	Ongoing			
Hillsborough Bay	City of Plant City	1292	Plant City Sewer Line Maintenance Program	Ongoing			
Hillsborough Bay	City of Plant City	1314	Street Sweeping - City of Plant City	Ongoing			
Hillsborough Bay	City of Tampa	149	Assist businesses in implementing site management practices to reduce stormwater runoff	Ongoing	Yes		

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Implementation Period	Education Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Hillsborough Bay	City of Tampa	161	Expand Central Sewer Service to areas served by septic systems	Ongoing		434.6	
Hillsborough Bay	City of Tampa	174	Encourage waterfront residents to enhance shorelines and limit runoff from yards	Ongoing	Yes		
Hillsborough Bay	City of Tampa	974	Reduce Occurrences of Municipal Sewer Overflows to Tampa Bay	Ongoing			
Hillsborough Bay	City of Tampa	1293	City of Tampa Interactive Watershed Atlas	Ongoing	Yes		
Hillsborough Bay	City of Tampa	1297	City of Tampa Riverwalk Project	Ongoing			
Hillsborough Bay	City of Tampa	1409	Street Sweeping Program	Ongoing		6804	
Hillsborough Bay	City of Tampa	16, 148	Continue support for Florida Yards & Neighborhoods and similar pollution prevention programs.	Ongoing	Yes		
Hillsborough Bay	FDEP/FDACS	1182, 1184, 1187, 1189, 1190	Agricultural BMPs	Ongoing			
Hillsborough Bay	FDEP/FDACS	41, 42	Land Limited BMPs For Dairy Farms In Areas Of Urbanization Within The Hillsborough R. Watershed	Ongoing	Yes		
Hillsborough Bay	Hillsborough County	22	Florida Yards And Neighborhood Program	Ongoing	Yes		
Hillsborough Bay	Hillsborough County	23	Supplements To FY&N	Ongoing	Yes		
Hillsborough Bay	Hillsborough County	288	Support implementation of BMPs	Ongoing			
Hillsborough Bay	Hillsborough County	570	Hillsborough County Adopt-A-Pond	Ongoing	Yes		$40,000
Hillsborough Bay	Hillsborough County	591	Hillsborough Lake Management Program (LaMP)	Ongoing	Yes		$240,000
Hillsborough Bay	Pasco County	1300	New River and Hillsborough River Watershed Management Plans in Pasco County	Ongoing			
Hillsborough Bay	Polk County	1301	Drainage Maintenance on Blackwater Creek	Ongoing			
Hillsborough Bay	Polk County	1302	Illicit Discharge Complaint Investigation	Ongoing			
Hillsborough Bay	Polk County	1303	Routine Maintenance Erosion Control	Ongoing			
Hillsborough Bay	Tampa Bay Water	869	Tampa Bypass Canal Water Quality Protection Plan	Ongoing			$75,000
Hillsborough Bay	Tampa Bay Water	1067	Tampa Bay Regional Surface Water Treatment Plant & Expansion (Alafia River)	Ongoing		47880	
Hillsborough Bay	Tampa Bay Water	1078	Tampa Bay Regional Surface Water Treatment Plant & Expansion (Tampa By-Pass Canal)	Ongoing		121438	
Hillsborough Bay	Tampa Bay Water	1402	Tampa Bay Water Stormwater Systems	Ongoing			
Hillsborough Bay	Tampa Port Authority	394	Stormwater Pollution Prevention Plan (SWPPP)	Ongoing	Yes		$300,000
Hillsborough Bay	Tampa Port Authority	397	Reduce pollution from recreational boaters	Ongoing	Yes		$75,000
Hillsborough Bay	Tampa Port Authority	402	Encourage waterfront homeowners to enhance shorelines and limit runoff	Ongoing	Yes		$16,000
Hillsborough Bay	Tampa Port Authority	995	Support for Multiple Public Education Projects	Ongoing	Yes		$15,000
Middle Tampa Bay	City of St. Petersburg	364	Support for FY&N Program	Ongoing	Yes		$15,000

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Imple-mentation Period	Edu-cation Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Middle Tampa Bay	City of St. Petersburg	365	Assist businesses in implementing BMPs to reduce stormwater pollution	Ongoing	Yes		$50,000
Middle Tampa Bay	City of St. Petersburg	370	Expand central sewer system to areas served by septic tanks	Ongoing			$75,000
Middle Tampa Bay	City of St. Petersburg	373	Identify overflow areas and address them in their maintenance plan	Ongoing			$8,000,000
Middle Tampa Bay	City of St. Petersburg	756	St. Petersburg Municipal Marina – Clean Marina Program	Ongoing	Yes		$37,500
Middle Tampa Bay	City of St. Petersburg	1004	Green City	Ongoing	Yes		
Middle Tampa Bay	City of St. Petersburg	1305	Street Sweeping – Middle Tampa Bay	Ongoing		500	
Middle Tampa Bay	City of St. Petersburg	369, 468	Expand and Improve Reclaimed Water System	Ongoing			
Middle Tampa Bay	Hillsborough County	570	Hillsborough County Adopt-A-Pond	Ongoing	Yes		
Middle Tampa Bay	Hillsborough County	1068	Hillsborough County Pet Waste Campaign	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	69	FY & N Florida Schoolyard Program	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	70	Florida Yards & Neighborhoods Program	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	71	FY & N Concepts For County Buildings And Lands	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	331	Florida Yards & Neighborhoods (FY&N) and similar pollution prevention programs	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	332	Training in Green Industries BMPs	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	333	FY&N classes, Water-Wise Awards and Workshops	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	340	Expand sewer service to septic tank users in selected areas	Ongoing			
Middle Tampa Bay	Pinellas County	1380	Street Sweeping Improved	Ongoing		56	
Middle Tampa Bay	Pinellas County	1390	Pinellas Co Fertilizer Ordinance	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	1391	Pinellas Co. Pet Waste Ordinance	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	1392	Pinellas Co. Landscape Ordinance	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	1393	Pinellas Co. Adopt-A-Pond Program	Ongoing	Yes		
Middle Tampa Bay	Pinellas County	1394	Tampa Bay Water Atlas	Ongoing	Yes		
Middle Tampa Bay	SWFWMD	1458	Riverside Club Community Education	Ongoing	Yes		$8,043
Lower Tampa Bay	City of St. Petersburg	369, 468	Expand and Improve Reclaimed Water System	Ongoing			$9,500,000
Lower Tampa Bay	Manatee County	90	Florida Yards And Neighborhoods Program	Ongoing	Yes	845.6	$750,000
Lower Tampa Bay	Pinellas County	69	FY & N Florida Schoolyard Program	Ongoing	Yes		
Lower Tampa Bay	Pinellas County	70	Florida Yards & Neighborhoods Program	Ongoing	Yes		$158,500
Lower Tampa Bay	Pinellas County	71	FY & N Concepts For County Buildings And Lands	Ongoing	Yes		
Lower Tampa Bay	Pinellas County	331	Florida Yards & Neighborhoods (FY&N) and similar pollution prevention programs	Ongoing	Yes		$175,000
Lower Tampa Bay	Pinellas County	332	Training in Green Industries BMPs	Ongoing	Yes		
Lower Tampa Bay	Pinellas County	333	FY&N classes, Water-Wise Awards and Workshops	Ongoing	Yes		
Lower Tampa Bay	Pinellas County	340	Expand sewer service to septic tank users in selected areas	Ongoing			$4,000,000

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Imple-mentation Period	Edu-cation Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Remainder LTB	City of Largo	1025	Commercial User Program	Ongoing			
Remainder LTB	City of Largo	1026	Privately-owned collection and transmission system program	Ongoing			
Remainder LTB	City of Largo	1045	Stormwater Monitoring System	Ongoing			$25,000
Remainder LTB	City of St. Petersburg	364	Support for FY&N Program	Ongoing	Yes		
Remainder LTB	City of St. Petersburg	365	Assist businesses in implementing BMPs to reduce stormwater pollution	Ongoing	Yes		
Remainder LTB	City of St. Petersburg	370	Expand central sewer system to areas served by septic tanks	Ongoing			
Remainder LTB	City of St. Petersburg	373	Identify overflow areas and address them in their maintenance plan	Ongoing			
Remainder LTB	City of St. Petersburg	999	Tropicana Field Stormwater Enhancements and Education	Ongoing	Yes		$818,500
Remainder LTB	City of St. Petersburg	1307	Street Sweeping - Boca Ciega Bay	Ongoing		345	
Remainder LTB	City of St. Petersburg	369, 468	Expand and Improve Reclaimed Water System	Ongoing			
Remainder LTB	Manatee County	90	Florida Yards And Neighborhoods Program	Ongoing	Yes		
Remainder LTB	Manatee County	956	Visitors Center at Emerson Point Park	Ongoing	Yes		$800,000
Remainder LTB	Manatee County	970	Clean Marina Requirement	Ongoing	Yes		$2,500
Remainder LTB	Pinellas County	69	FY & N Florida Schoolyard Program	Ongoing	Yes		
Remainder LTB	Pinellas County	70	Florida Yards & Neighborhoods Program	Ongoing	Yes		
Remainder LTB	Pinellas County	71	FY & N Concepts For County Buildings And Lands	Ongoing	Yes		
Remainder LTB	Pinellas County	331	Florida Yards & Neighborhoods (FY&N) and similar pollution prevention programs	Ongoing	Yes		
Remainder LTB	Pinellas County	332	Training in Green Industries BMPs	Ongoing	Yes		
Remainder LTB	Pinellas County	333	FY&N classes, Water-Wise Awards and Workshops	Ongoing	Yes		
Remainder LTB	Pinellas County	340	Expand sewer service to septic tank users in selected areas	Ongoing			
Remainder LTB	Pinellas County	671	Shell Key Preserve Management Plan	Ongoing			$2,000
Remainder LTB	Pinellas County	736	Pinellas County Adopt-A-Pond	Ongoing	Yes		$27,500
Remainder LTB	Pinellas County	1381	Street Sweeping Improved	Ongoing		1090	
Remainder LTB	Pinellas County	1390	Pinellas Co Fertilizer Ordinance	Ongoing	Yes		
Remainder LTB	Pinellas County	1391	Pinellas Co. Pet Waste Ordinance	Ongoing	Yes		
Remainder LTB	Pinellas County	1392	Pinellas Co. Landscape Ordinance	Ongoing	Yes		
Remainder LTB	Pinellas County	1393	Pinellas Co. Adopt-A-Pond Program	Ongoing	Yes		
Remainder LTB	Pinellas County	1394	Tampa Bay Water Atlas	Ongoing	Yes		
Remainder LTB	Sarasota County	1243	Florida Yards & Neighborhoods	Ongoing	Yes		
Remainder LTB	Sarasota County	1246	Benderson Park Rowing Facility	Ongoing		9225.5	
Remainder LTB	Sarasota County	1247	Illicit Discharge Detection & Elimination	Ongoing			
Remainder LTB	SWFWMD	840	South Cross Bayou Water Reclamation Facility Tour and Education Program	Ongoing	Yes	6804	$95,000

Table 9. Listing of future planned projects submitted by Consortium participants into the online Tampa Bay Action Plan Database (http://apdb.tbeptech.org).

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Implementation Period	Education Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Old Tampa Bay	City of Largo	1408	Planned WWRF Improvements	2023+		14800.4	
Old Tampa Bay	City of Tampa	1459	Upper Peninsula DM/Henderson	2022		160	$40,000,00
Old Tampa Bay	Pinellas County	1399	Long Branch Stormwater Improvements, W22-04, -05, -08	2030			
Old Tampa Bay	Pinellas County	1400	Alligator Creek Stormwater Improvements, W14-03	2030			
Old Tampa Bay	Pinellas County	1401	Roosevelt Stormwater Ponds, W23-01,-10, -03	2030			
Old Tampa Bay	Pinellas County	1436	Cross Bayou Implementation Phase 2	2030			$4,000,000
Old Tampa Bay	Pinellas County	1437	N Highland Phase 1	2023			$2,000,000
Old Tampa Bay	Pinellas County	1438	Whitney Road and Wolford Road intersection and Roadway Improvements	2025			
Old Tampa Bay	Pinellas County	1439	Bee Branch Phase 3 Erosion Control	2024			
Old Tampa Bay	Pinellas County	1440	Roosevelt Creek Channel 5 Improvements	2023			$7,500,000
Old Tampa Bay	Pinellas County	1447	Mullet Creek Channel B Erosion Control	2023			$2,000,000
Hillsborough Bay	City of Lakeland	1057	Lakeland Methane to Energy project – Phase II	Future			$950,000
Hillsborough Bay	City of Lakeland	1058	Lakeland SCR Project	In Progress?			
Hillsborough Bay	City of Lakeland	1059	Lakeland Hi-Efficiency Burners	In Progress?			
Hillsborough Bay	City of Lakeland	1061	Lakeland Methane to Energy project – Phase I	In Progress?			$150,000
Hillsborough Bay	City of Tampa	158	South Tampa Area Reclaim Project (STAR)	Future			$21,000,000
Hillsborough Bay	City of Tampa	1218	Sediment Trap NSBB: Brorien St	Future		6.6	$75,000
Hillsborough Bay	City of Tampa	1223	North Tampa Closed Basins – Phase 1	Future		10	$1,100,000
Hillsborough Bay	City of Tampa	1255	Bayshore Blvd. Reclaimed Water Expansion	Future			$550,000
Hillsborough Bay	City of Tampa	571, 830	North Tampa Pipeline	Future			$200,000
Hillsborough Bay	City of Tampa	1460	Cypress St. Outfall	2022		177	$30,000,000
Hillsborough Bay	City of Tampa	1461	Southeast Seminole Heights	2022		283	$23,500,000
Hillsborough Bay	City of Tampa	1462	Lower Penn Southeast	2023		729	$25,000,000
Hillsborough Bay	Hillsboro. County	1464	Delaney Creek Water Quality Improvements	2023		236	$4,000,000
Hillsborough Bay	Hillsboro. County	1465	East Lake Channel Nutrient Removal	2022		3075.2	$780,958
Hillsborough Bay	Mosaic	857	Mulberry, Closure of Mulberry Phosphogypsum Stack	2022+			
Hillsborough Bay	Mosaic	1233	Green Bay Discharge Diversion to Progress Energy	Future		12233.4	
Hillsborough Bay	Pasco County	1179	Reclaimed Water Reservoir Floating Wetland Island	Future			$250,000
Hillsborough Bay	Tampa Bay Water	868	Alafia River Water Quality Protection Plan (WQPP)	2021			$75,000
Lower Tampa Bay	Manatee County	1453	Robinson Preserve Coastal Habitat Restoration	2022			$1,548,211
Remainder LTB	FDOT	1166	201032-2 - I-75 at SR 70 Interchange	2020			$10,000,000
Remainder LTB	Manatee County	714	Ware's Creek Flood Reduction	Future			$4,600,000
Remainder LTB	Manatee County	1260	Duette Preserve Wetlands Restoration	Future			$200,000
Remainder LTB	Manatee County	1261	Bennett Park	Future			$285,310
Remainder LTB	Manatee County	1354	Manatee County SEWRF Upgrade	Future			$9,866,747
Remainder LTB	Manatee County	1455	Collins Dairy Drain	2024			$1,175,799
Remainder LTB	Manatee County	1456	Duette - Lake Manatee Watershed Improvement Phase 2B	2022			$175,000
Remainder LTB	Manatee County	1457	Duette Preserve -Wetland Mitigation	2023		82.8	$2,000,400
Remainder LTB	Pinellas County	470	Lake Seminole Clean-up	Future			$16,700,000

Bay Segment	Lead Entity	Action Plan ID	Project Name/Description	Completion Year/Implementation Period	Education Credits?	Anticipated N Load Offset (lbs./yr)	Estimated Future Costs
Remainder LTB	Pinellas County	1252	Joe's Creek Greenway Park	2021			$397,200
Remainder LTB	Pinellas County	1365	Bridgeway Acres Pond A Dredging	Future			
Remainder LTB	Pinellas County	1442	Lealman Regional Stormwater Facility	Future			
Remainder LTB	Pinellas County	1445	Baypointe Stormwater Conservation Area	2024			$4,000,000
Remainder LTB	Pinellas County	1446	Ibis Pond	Future			
Remainder LTB	Pinellas County	1450	M10 Starkey Water Quality Improvements	2023			$2,000,000

3.c. Geographic scope of any proposed management activity:

2022 RA Update: No change. The NMC Action Plan projects are located throughout the Tampa Bay watershed, as described and depicted in the previous section.

3.d. Estimated Pollutant Load Reduction Anticipated from each activity:

2022 RA Update: Based on projects implemented over the 2017-2021 period, it is estimated that cumulatively an additional 420.9 tons/yr of total nitrogen has been precluded from entering Tampa Bay (Table 7). In addition, Consortium participants anticipate completion of projects after 2021 that will be incorporated into the 2027 Reasonable Assurance Update. To date, approximately 70.5 tons/yr of total nitrogen is estimated to be precluded from entering Tampa Bay after 2021 (Table 8 & Table 9).

3.e. Written agreements committing partners to actions:

2022 RA Update: The Tampa Bay Nitrogen Management Consortium gave consensus approval (with no objections) at their November 15, 2022 meeting to submit this document to FDEP as the 2022 RA Update for Tampa Bay. Participation status, meeting notes, presentations, discussions and decision memos of NMC participants during the course of this 2022 RA Update can be found at https://tbep.org/our-work/boards-committees/nitrogen-management-consortium/

3.f. How will future growth and new sources be addressed:

2022 RA Update: Consistent with prior RA approvals and the 2009 RA Addendum, allocations to all TN loading sources in the Tampa Bay watershed have been formalized and cumulatively capped at the federally-recognized TMDL for each bay segment. To stay within the TMDL limits, allocations for interim, new, and transferred sources were reviewed and updated during the 2022 RA Update. These reviews led to formal NMC concurrence of allocations assigned to each entity for the 2022-2026 Reasonable Assurance implementation period, and total bay segment allocations continue to remain within the TMDL limits for the Tampa Bay segments recognized under the 2002-2017 RA periods (Table 10 - Table 14). In addition, the FDEP SW District has previously provided information on facilities considered under the small source allocation for each bay segment. Based on FDEP SW District staff guidance, small sources are defined in Appendix 1 of the 2017 RA Update and include facilities that discharge less than 0.1 MGD to groundwater or surface waters (excluding facilities that have individual allocations from prior RA Updates).

Furthermore, the Tampa Bay NMC has developed recommended protocols to address any unforeseen need for a TN load allocation. Consortium participants have previously formalized a process to address new, missed or expanded TN sources in future RA updates, and FDEP has concurred with those recommendations. Lastly, during the development of the 2017 RA Update, Consortium participants developed recommendations for assignment of any unassigned reservation allocation that may occur in the future (see Appendix 2 of the 2017 RA Update).

Table 10. Total nitrogen load allocation table for Old Tampa Bay for the 2022-2026 Reasonable Assurance implementation period. SW=Surface water discharge allocation, RE=Reuse discharge allocation.

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Cheval West	MS4	0.20%	0.7
City of Clearwater	MS4	2.70%	10.6
	Point Source – Clearwater East SW		9.3
	Point Source – Clearwater East RE		0.1
	Point Source – Clearwater Northeast SW		16.6
	Point Source – Clearwater Northeast RE		1.1
Duke Energy	Point Source – Bartow Station SW		3.0
Heritage Harbor	NPS	0.20%	0.6
Hillsborough County	MS4	23.30%	91.6
	Point Source – Dale Mabry SW		7.4
	Point Source – Dale Mabry RE		2.8
	Point Source – Northwest Regional SW		2.9
	Point Source – Northwest Regional RE		5.5
	Point Source – River Oaks SW		13.4
	Point Source – River Oaks RE		1.6
	Point Source – Van Dyke		0.8
City of Largo	MS4	1.40%	5.5
	Point Source – Largo SW		16.4
	Point Source – Largo RE		2.6
MacDill Air Force Base	MS4	0.10%	0.4
City of Oldsmar	MS4	1.40%	5.4
	Point Source – Oldsmar SW		2.7
	Point Source – Oldsmar RE		0.5
On Top of the World	Point Source – On Top of the World RE		0.5
Palm Bay	NPS	<0.1%	0.0
Park Place	NPS	0.10%	0.4
Pasco County	MS4	0.40%	1.7
Pinellas County	MS4	14.70%	57.6
	Point Source – W.E. Dunn RE		2.3
	Point Source – Bridgeway Acres SW		1.2
City of Pinellas Park	MS4	1.00%	4.0
City of Safety Harbor	MS4	1.30%	5.0
City of St. Petersburg	MS4	0.90%	3.5
	Point Source – St. Pete Facilities RE		4.7
Stonebriar	NPS	0.10%	0.2
City of Tarpon Springs	MS4	0.40%	1.6
City of Tampa	MS4	5.30%	20.8

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Westchase	NPS	0.40%	1.4
Westchase East	NPS	0.40%	1.7
Non-MS4/Non-Ag NPS		2.60%	10.1
Atmospheric Deposition		33.60%	131.8
Other (Groundwater, Springs, Conservation)		3.60%	11.0
FDACS (Agriculture)		6.10%	24.1
Small Sources			1.0
Total			**486**

Table 11. Total nitrogen load allocation table for Hillsborough Bay for the 2022-2026 Reasonable Assurance implementation period. SW=Surface water discharge allocation, RE=Reuse discharge allocation.

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Hillsborough County	MS4	22.60%	235.6
	Point Source – Falkenburg SW		15.2
	Point Source – Falkenburg RE		2.8
	Point Source – South County SW		1.8
	Point Source – Pebble Creek SW		0.3
	Point Source – Pebble Creek RE		0.1
	Point Source – Valrico SW		5.6
	Point Source – Valrico RE		5.0
City of Lakeland	MS4	1.10%	10.9
	Point Source – Lakeland SW		20.0
	Point Source – Lakeland RE		0.2
City of Mulberry	MS4	0.20%	2.1
	Point Source – Mulberry SW		2.4
Pasco County	MS4	3.70%	38.4
	Point Source – Master Reuse System RE		5.8
City of Plant City	MS4	0.90%	9.2
	Point Source – Plant City SW		9.5
	Point Source – Plant City RE		1.0
Polk County	MS4	6.50%	67.5
	Point Source – NW Regional RE		0.6
	Point Source – SW Regional RE		1.1
City of Tampa	MS4	4.80%	50.0
	Point Source – HF Curren SW		212.2
	Point Source – HF Curren RE		1.0
City of Zephyrhills	MS4	0.20%	1.6
	Point Source – Zephyrhills RE		3.0
CSX	Point Source – Rockport Material Losses		5.6
	Point Source – Winston Yard SW		3.0
	Point Source – Rockport SW		6.0
	Point Source – Newport SW (FKA Eastern Terminals SW)		
	Point Source – Newport Material Losses (FKA East. Term. Material Losses)		5.6
Kinder Morgan	Point Source – Material Losses – Port Sutton		1.8
	Point Source – Material Losses – Tampaplex		3.4
	Point Source – Hartford Terminal SW		25.0
	Point Source – Port Sutton SW		
	Point Source – Tampaplex SW		
Mosaic	Point Source – Riverview Material Losses		9.9
	Point Source – Tampa Marine ML (FKA CF Material Losses)		
	Point Source – Big Bend Material Losses		
	Point Source – Bartow SW	12%	123.8

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
	Point Source – Ft. Lonesome SW		
	Point Source – Green Bay SW		
	Point Source – Hookers Prairie SW		
	Point Source – Hopewell SW		
	Point Source – Kingsford SW		
	Point Source – Mulberry SW		
	Point Source – New Wales Stack Closure SW		
	Point Source – Nichols Mine SW		
	Point Source – Riverview SW		
	Point Source – Riverview Stack Closure SW		
	Point Source – South Pierce SW		
	Point Source – Bonnie (FKA CF Bartow SW)		
	Point Source – Tampa Ammonia (FKA CF Tampa NH4 SW)		
	Point Source – Tampa Marine SW (FKA CF Tampa Phos. SW)		
	Point Source – Port Sutton SW (FKA KM NH4 Facility SW)		
	Point Source – Plant City SW (FKA CF Plant City SW)		
	Point Source – Mulberry Phosphogypsum Stack SW		
	Point Source – New Wales Chemical Plant SW		
Agrifos	Point Source – Nichols Prep Plant SW	<0.1%	0.0
Brewster Phosphogypsum	Point Source SW	0.10%	1.0
Alpha/Owens Corning	Point Source SW	0.10%	1.0
Coronet Industries	Point Source SW	0.50%	4.7
Estech Agricola	Point Source SW	0.30%	2.6
Exxon Mobil	Point Source SW	0.20%	1.7
Kerry I&F Contracting	Point Source SW		1.3
Tampa Bay Water	Point Source SW		1.5
TECO Bayside	Point Source SW	0.10%	0.8
Trademark Nitrogen	Point Source SW	<0.1%	0.2
Yara North America	Point Source SW	<0.1%	0.3
Alafia Preserve	NPS	0.10%	0.6
Bloomingdale	NPS	<0.1%	0.0
Donaldson Knoll	NPS	<0.1%	0.1
Eagle Ridge	NPS	0.10%	0.7
Lake St. Charles	NPS	<0.1%	0.4
Live Oak I	NPS	<0.1%	0.2
Live Oak II	NPS	<0.1%	0.1
Magnolia Park	NPS	<0.1%	0.1
MacDill Air Force Base	MS4	0.10%	0.7
Palm River	NPS	<0.1%	0.0

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Panther Trace	NPS	<0.1%	0.3
Panther Trace II	NPS	<0.1%	0.2
Rivercrest	NPS	<0.1%	0.3
City of San Antonio	NPS	<0.1%	0.3
Spring Lake	NPS	<0.1%	0.1
City of St. Leo	NPS	<0.1%	0.0
Stone Crest	NPS	<0.1%	0.0
Stone Dairy Creek	NPS	<0.1%	0.0
Stonelake Ranch	NPS	<0.1%	0.0
City of Temple Terrace	MS4	0.20%	2.1
Non-MS4/Non-Ag NPS		0.50%	5.2
Atmospheric Deposition		6.00%	63.0
Other (Groundwater, Springs, Conservation)		13.50%	140.2
FDACS (Agriculture)		25.80%	268.8
Small Sources			10.5
ZooTampa	Point Source SW		1.0
Busch Gardens	Point Source SW		1.0
Cypress Lakes WWTP	Point Source		0.3
Forest Lake Estates WWTP	Point Source		0.3
Windemere Utilities	Point Source		0.9
Country Meadows-Golden Lakes	Point Source		1.0
Unassigned reservation			50.5
Total			**1451**

Table 12. Total nitrogen load allocation table for Middle Tampa Bay for the 20222026 Reasonable Assurance implementation period. SW=Surface water discharge allocation, RE=Reuse discharge allocation.

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Harbor Bay	NPS	<0.1%	0.2
Hillsborough County	MS4	9.90%	70.9
	Point Source - South County RE		0.5
MacDill Air Force Base	MS4	1.00%	7.0
	Point Source - WWTP RE		0.7
Manatee County	MS4	3.00%	21.8
Pinellas County	MS4	0.50%	3.2
City of Pinellas Park	MS4	0.70%	5.3
City of St. Petersburg	MS4	6.50%	46.5
	Point Source - St. Pete Facilities RE		20.8
Mosaic	Point Source - Four Corners SW	4.10%	29.3
TECO Big Bend	Point Source – SW		56.5
	Point Source – RE		2.1
Non-MS4/Non-Ag NPS		0.50%	3.8
Atmospheric Deposition		35.20%	252.1
Other (Groundwater, Springs, Conservation)		5.10%	36.7
FDACS (Agriculture)		33.40%	239.2
Small Sources			2.4
Total			**799**

Table 13. Total nitrogen load allocation table for Lower Tampa Bay for the 2022-2026 Reasonable Assurance implementation period. SW=Surface water discharge allocation, RE=Reuse discharge allocation.

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
Hillsborough County	MS4	<0.1%	0.0
Lexington	NPS	<0.1%	0.1
Manatee County	MS4	7.80%	26.8
	Point Source - Manatee County North RE		3.9
City of St. Petersburg	MS4	<0.1%	0.0
Kinder Morgan Port Manatee Material Losses	Point Source		0.3
Piney Point Facility	Point Source SW		0.9
Non-MS4/Non-Ag NPS		0.50%	1.7
Atmospheric Deposition		81.80%	281.0
Other (Groundwater, Springs, Conservation)		1.20%	4.2
FDACS (Agriculture)		8.60%	29.7
Small Sources			0.3
Total			**349**

Table 14. Total nitrogen load allocation table for the Remainder of Lower Tampa Bay for the 2022-2026 Reasonable Assurance implementation period. SW=Surface water discharge allocation, RE=Reuse discharge allocation.

Entity	Source	Percent Remaining Allocation (if applicable)	5-yr Average TMDL Equivalent Load (tons/year)
City of Bradenton	MS4	1.80%	10.8
	Point Source - Bradenton SW		18.6
	Point Source - Bradenton RE		0.6
City of Gulfport	MS4	0.40%	2.2
Greyhawk Landing	NPS	0.10%	0.8
Harbourage at Braden River	NPS	<0.1%	0.0
Heritage Harbour	NPS	0.10%	0.8
Heritage Harbour Marketplace	NPS	<0.1%	0.1
Lakewood Ranch	MS4	1.50%	8.7
Lexington	NPS	<0.1%	0.1
Manatee County	MS4	22.00%	130.2
	Point Source - Southeast RE		2.7
Pinellas County	MS4	0.20%	1.1
City of Palmetto	MS4	0.80%	4.6
	Point Source - Palmetto SW		2.2
	Point Source - Palmetto RE		1.0
Sarasota County	MS4	1.40%	8.2
City of St. Petersburg Beach	MS4	0.20%	1.2
City of St. Petersburg	MS4	1.30%	7.5
	Point Source - St. Pete Facilities RE		1.6
Tara	NPS	0.20%	1.1
University Place	NPS	0.10%	0.6
Waterlefe	NPS	0.10%	0.6
Tropicana	Point Source SW		9.1
Non-MS4/Non-Ag NPS		<0.1%	0.0
Atmospheric Deposition		13.00%	76.9
Other (Groundwater, Springs, Conservation)		10.90%	64.8
FDACS (Agriculture)		46.00%	272.6
Total			**629**

3.g. Confirmed sources of funding:

2022 RA Update: No change. Consortium participants continue to abide by the recommended funding levels for participation in the NMC's process to deliver 5-year RA updates to the FDEP. For each 5-year RA period, all participating NMC entities with a 5-year annual average allocation less than one ton TN per year are requested to contribute a recommended nominal amount of $500, and all other sources are requested to contribute a one-time recommended amount of $6,000. The per-entity contribution can be reduced accordingly if more than 25 members contribute. Consortium contributions are due generally in Years 1-2 of an RA cycle, to allow time for development of the technical basis required for an update. All entities with allocations or providing regulatory oversight/input to the RA Update process (in-kind support) are invited to attend and encouraged to participate in all Consortium meetings and deliberations in the future. A chronology of NMC activities and meetings can be found at https://tbep.org/our-work/boards-committees/nitrogen-management-consortium/.

In addition, Consortium participants have planned investments of **$256,832,172** to continue projects listed in Table 8 and implement new projects listed in Table 9.

3.h. Implementation schedule:

2022 RA Update: No change. Consortium participants continue to develop future load reduction projects within the watershed and document these planned activities within the online Tampa Bay Action Plan Database (http://apdb.tbeptech.org). Table 8 shows a listing of ongoing projects being implemented by Consortium participants. Table 9 lists projects that are planned to be initiated/completed after 2021 by Consortium participants.

3.i. Enforcement programs, if the management strategy is not voluntary:

2022 RA Update: No change. Participation in the Tampa Bay Nitrogen Management Consortium will continue to be voluntary, and the NMC partners will continue to encourage point and nonpoint sources who are not currently participating in the NMC to join this effort. The allocation compliance assessment process referenced in Section 2.a. will continue to be employed during the 2022-2026 RA implementation period. An assessment of the current 2017-21 RA period can be found in Appendices 1 - 5. Lastly, FDEP representatives of the NMC emphasize that FDEP and other regulatory agencies will continue to ensure that permitted facilities meet all permit requirements through existing regulatory and permit enforcement programs.

4. Procedures for Monitoring and Reporting Results:

4.a. A description of the water quality monitoring program to be implemented

2022 RA Update: No change. Existing water quality monitoring programs include monthly ambient collections conducted by the Environmental Protection Commission of Hillsborough County, Manatee County, and Pinellas County. Water quality samples from over 100 stations baywide are collected and analyzed on a monthly basis through the collective efforts of these monitoring programs. These Tampa Bay regional monitoring programs have been considered among the top programs in the nation[1]. Additional investigations into Old Tampa Bay's recent water quality trends have highlighted the need to refine our understanding of *Pyrodinium bahamense* bloom dynamics. Additional monitoring tools and investments may be necessary to understand this alga, as well as *Caulerpa* spp. and other macroalgal bloom dynamics presently occurring in Tampa Bay.

4.b. Quality Assurance/Quality Control elements of monitoring

2022 RA Update: No change. All county monitoring programs and their laboratories have State-approved Quality Assurance Plans on file, and comply with FDEP's QA rule, Chapter 62-160, including FDEP approved Standard Operating Procedures. All participating county laboratories are National Environmental Laboratory Accreditation Conference (NELAC) certified. Quarterly round-robin exchanges for statistically-rigorous, inter-laboratory comparisons are conducted by the Southwest Florida Regional Ambient Monitoring Program (SWFL RAMP) participants (see meeting materials library here: https://tbep.org/our-work/boards-committees/technical-advisory-committee/).

4.c. Procedures for entering all appropriate data into WIN/STORET:

2022 RA Update: No change. The County programs continue to comply with the latest WIN data upload procedures developed by the FDEP. Through discussions of the SWFL RAMP, all Tampa Bay water quality monitoring data providers upload data to WIN.

4.d. Responsible monitoring and reporting entity:

2022 RA Update: No change. The three entities identified in Section 4.a. continue to be responsible for collecting water quality data. TBEP staff and the NMC's data management contractor continue to assimilate and summarize relevant data on an annual basis to provide compliance assessment reports to the FDEP. Reports for the 2017-2021 RA period can be found at https://tbep.org/our-work/boards-committees/nitrogen-management-consortium/.

4. e. Frequency and reporting format for reporting monitoring results:

2022 RA Update: No change. As part of this update, the TBEP and TBNMC have funded the development of estimated TN, TP, TSS and BOD loads for the Tampa Bay watershed over the 2017-2021 RA Period. In addition, the Consortium updated a Screening Level Tool for Estimating Annual Hydrologic Loadings to Tampa Bay for use to assess annual compliance of hydrologically-adjusted allocations.

[1]Schiff, K., P. Trowbridge, E. Sherwood, P. Tango, R. Batiuk (2015) Regional monitoring programs in the US: Synthesis of four case studies from Pacific, Atlantic, and Gulf Coasts. Regional Studies in Marine Science 4, A1–A7. https://doi.org/10.1016/j.rsma.2015.11.007 .

4.f. Frequency and format for reporting on the implementation of all proposed management activities:

2022 RA Update: No change. Formal reporting of results and action plan projects will continue to occur every 5 years. Annual assessment of bay water quality conditions will continue during the 2022-2026 RA Implementation Period. In response to the Compliance Assessment outcomes in the OTB segment (Table 2), an assimilative capacity assessment will be investigated and reported upon during the 2022-2026 RA Implementation period.

4. g. Methods for evaluating progress towards goals:

2022 RA Update: No change. Formal reporting of chlorophyll-a threshold compliance will continue on an annual basis and integrate any new seagrass acreage estimates or trends. If exceedances of the chlorophyll-a thresholds occur in two concurrent years in any one bay segment, additional assessment steps are required by the Consortium. Otherwise, Reasonable Assurance updates with a full assessment of loading conditions to Tampa Bay will occur every 5 years.

As previously mentioned, the TBNMC will re-assess the assimilative capacity of the Old Tampa Bay segment over the 2022-2026 RA implementation period. Any refinements to bay segment load targets, entity allocations and/or numeric nutrient criteria will be considered during this time and the RA assessment framework will be revised for this bay segment, as needed. Additional scrutiny of annual water quality conditions and seagrass recovery in OTB, and the broader Tampa Bay estuary, is anticipated through the TBEP, TBNMC, and the TBNMC's Old Tampa Bay Working Group until conditions improve.

5. Description of Proposed Corrective Actions:

2022 RA Update: Four annual exceedances of the chlorophyll-a threshold occurred in the Old Tampa Bay segment during the 2017-2021 RA period. Seagrass conditions in this bay segment show consistent decreasing acreage trends. Bay managers continue to explore the feasibility and implementation of management actions that could improve this bay segment's overall ecological condition and water quality. Several Tampa Bay Estuary Program research initiatives and Technical Advisory Committee recommendations have directed research and restoration efforts in this bay segment and its watershed. As a result, several cooperative projects have been implemented over the 2017-2021 RA period and continue to be implemented today. Furthermore, TBEP and Consortium partners continue to implement habitat restoration, stormwater infrastructure and point source improvement projects throughout the Tampa Bay watershed that cumulatively contribute to the bay's overall ecological improvement. A summary of relevant projects focused in Old Tampa Bay follows:

NOAA Actionable Science Research Planning Grant (Research)

The primary ecological challenges in Old Tampa Bay (OTB) are: 1) limited seagrass expansion in distinct, poor tidal circulation areas; 2) organic sediment accumulation in upper OTB; 3) alteration of freshwater inflows to OTB from managed channels; and 4) recurring harmful algal blooms (HABs) caused by *Pyrodinium bahamense*. In addition to efforts to reduce nitrogen loads to Old Tampa Bay, novel strategies will be needed to adequately meet chlorophyll-a management targets in the future. Through a NOAA RESTORE Actionable Science grant, the Florida Fish & Wildlife Research Institute (FWRI) partnered with the TBEP to co-develop research initiatives that support decision making for actions that control dinoflagellate growth and improve water quality conditions supportive of longer-term seagrass recovery. Example management actions include causeway or flood control structure modifications that improve circulation and increase physical transport of algal cells out of OTB and potential shellfish restoration projects that increase grazing rates on algal cells. Additional research on recommended causeway alterations is anticipated during the 2022-2026 RA Implementation Period.

Investigating Use of Shellfish as a Bioremediation Strategy for *Pyrodinium* Blooms in OTB (Habitat Restoration & Research)

Through TBEP and Tampa Bay Environmental Restoration Fund grants, Florida Fish and Wildlife Conservation Commission (FWC) scientists explored several factors that influence the abundance of *Pyrodinium bahamense* in Old Tampa Bay. Project results suggest that dissolved inorganic nutrients, even at low concentrations, are enough to sustain bloom development and growth of this harmful alga and that alternative management strategies may need to be employed. In order to reduce the duration and severity of blooms and the associated impacts to the ecosystem, researchers recommended targeting actions that reduce cell abundance in Old Tampa Bay, such as improving tidal circulation or shellfish grazing. Both laboratory and *in situ* experiments indicated that eastern oyster (*Crassostrea virginica*) will actively graze *P. bahamense*. Their results suggest that oysters may be resilient to prolonged toxin exposure, but unknowns remain regarding long-term consequences of sub-lethal toxin exposures. An important next step will be to conduct modeling scenarios that consider the range of measured clearance rates to assess potential benefits of restoration strategies for bloom mitigation, and additional studies on adverse effects of toxins will improve estimates of potential risks and efficacy of oyster restoration as a bioremediation strategy. Study results can be found in TBEP Tech. Publications #02-22, #07a-21, and #09-19, and #07-17.

Channel 5 / Roosevelt Creek Basin Restoration (Stormwater & Habitat Restoration)
The TBEP was identified as a recipient of $100,000 to be directed towards a public interest project focused on improving the environmental quality of Old Tampa Bay and/or its watershed in the vicinity of the City of Largo. Funds were received in June 2021 and a partnership with Pinellas County was identified to remove a non-functioning weir and conduct habitat restoration associated with Channel 5 / Roosevelt Creek which drains into Old Tampa Bay in the vicinity of Feather Sound. Project components include construction activities centered around the removal of the weir, bank stabilization and grading, exotic plant and debris removal, and native plant installation. Pinellas County plans to complete the project by December 2025. The TBEP's Habitat Master Plan 2020 Update established 10-year targets for intertidal habitats (1,000 acres) and urban stream restoration (4 miles). Completion of this project will also assist in achieving these targets.

Rocky Point / Dana Shores Stormwater Improvement Designs (Stormwater & Habitat Restoration)
The TBEP has preliminarily identified coastal and upland habitat restoration opportunities that would meet established goals within the 2020 Habitat Master Plan. TBEP staff and a Restoration Coordination & Technical Support Services contractor are assisting partners at the Rocky Creek Golf Course and Dana Shores community to design and permit stormwater and habitat restoration enhancements along conveyances that ultimately discharge to northwest OTB. Reducing nitrogen loads from stormwater emanating from this OTB region is a primary goal for the project.

Tampa Bay Regional Stormwater Controls Identification & Implementation (Research, Stormwater & Habitat Restoration)
The TBEP, in partnership with the Tampa Bay Regional Planning Council, submitted a grant application to FDEP's RESTORE Funded Priorities List 3b solicitation in July 2022. This two-phase project seeks to develop a multi-jurisdictional stormwater master plan in the Old Tampa Bay watershed and implement high priority stormwater retrofits to reduce nonpoint source nutrient loads in the region. The project has been tentatively accepted for funding with expected initiation in Fall 2023.

Up in the Air, Down in the Water: Atmospheric Deposition in Tampa Bay (Research & Education)
This ongoing University of Florida research and IFAS extension/education project aims to better understand the contribution of atmospheric deposition to N loads in stormwater and the potential impact of atmospherically derived N on water quality in the Tampa Bay watershed. The project will produce at least 1 year of data on the forms and concentrations of N in wet atmospheric deposition before and after it interacts with the urban tree canopy and urban impervious surfaces and will characterize the degree to which atmospheric N is utilized by *Karenia brevis* and *Pyrodinium bahamense*, the toxic microalgae most responsible for algal problems in Tampa Bay. Videos, fact sheets, infographics, and workshops will also be provided.

Philippe Bay Stormwater Quality Upgrades (Education, Stormwater & Habitat Restoration)
This ongoing project, located in the Old Tampa Bay subwatershed, will install stormwater controls in a neighborhood constructed prior to stormwater quality regulations. An estimated 97.1 lbs/year of TN will be removed by constructing rain gardens, vegetated bioswales, a littoral shelf, control structures, drainage inlets to manage debris, and infiltration pipes.

Controlling *Pyrodinium* Outbreaks with Low-Cost Biochar (Research)
This ongoing research project will assess the ability of low-cost biochars to control outbreaks of *Pyrodinium bahamense* in Old Tampa Bay. A diverse team from the Florida Institute of Technology (FIT) and Mote Marine Laboratory will explore whether commercial biochars produced from waste biomass can be used to control algae growth and saxitoxin production.

***Caulerpa*-Seagrass Interactions in Tampa Bay (Research)**
This ongoing research project will evaluate the impacts of changes from seagrass meadows to *Caulerpa* spp. by conducting epifaunal sampling and field experiments to determine whether the habitats provide comparable ecosystem services. The project also aims to better understand *Caulerpa* spp. colonization rates in the bay.

Safety Harbor Living Shoreline and Spring Outfall Restoration (Education, Stormwater & Habitat Restoration)
This completed project enhanced coastal resilience by removing an existing seawall and replacing it with a living shoreline feature. Additionally, the existing spring outfall from the Safety Harbor Resort & Spa was improved by removing a portion of the pipe to recreate a natural intersection between the spring and the estuarine waters of Old Tampa Bay. Oysters and native plants were installed.

Philippe Park Living Shoreline (Education, Stormwater & Habitat Restoration)
This ongoing project will enhance up to 2,600 linear feet of Old Tampa Bay shoreline and improve water quality by reducing sedimentation, establishing filter-feeding oysters, and installing native vegetation.

6. Summary of progress since 2017 Reasonable Assurance Update Report

Data and observations from Tampa Bay indicate that continuing efforts to reduce nitrogen loading by the NMC partners resulted in adequate water quality supportive of seagrass recovery in the majority of Tampa Bay. However, water quality and seagrass conditions in Old Tampa Bay fell below goals during the 2017-2022 RA period. A summary of progress since the 2017 Tampa Bay Reasonable Assurance Update is below:

Management Actions & Restoration Investments

- More than 496 nitrogen load reduction projects have been implemented by Consortium participants since 1992. Collectively over the twenty-nine year period from 1992-2021, approximately 950.3 tons/year of TN loads have been precluded from entering Tampa Bay. Since 1992, over $836 million has been invested by Consortium participants towards nitrogen load reduction projects in the bay. When accounting for additional land acquisition and preservation activities, as well as educational stewardship programs within the watershed, the total amount invested is over $2.77 billion (as reported in the Tampa Bay Action Plan Database).
- Tampa Bay Nitrogen Management Consortium participants include over 45 participating public and private partners.
- Cumulatively, baywide TN load reductions over the 2017-2021 time period were estimated to be 420.9 tons/year. Additional ongoing, planned and budgeted projects post-2021 are expected to reduce TN loading by approximately 70.5 tons/year at a cost equal to $256,832,172 in the future.
- The Consortium partners have agreed to maintain TN load allocations within the federally-recognized TMDLs for each bay segment and as updated in Tables 10 - 14. Additional refinements for Old Tampa Bay will be investigated by the Consortium over the 2022-2026 RA Implementation period. Additionally, the Consortium continues to recognize that any load reductions generated by a particular entity will remain as a credit with that entity indefinitely, as described in Section IX.D. of the 2009 RA Addendum.
- In 2021, the Florida Legislature amended §403.064, F.S. to require that domestic wastewater utilities develop a plan for eliminating non-beneficial discharges to surface waterbodies by 2032. It is anticipated that projects to implement these requirements will result in additional nutrient load reductions to all bay segments with the most direct reductions potentially occurring in Old Tampa Bay and Hillsborough Bay.

Environmental Indicators

- In 2022, total seagrass acreage in the bay was provisionally estimated to be 30,137 acres. This represents a significant decrease of 11,518 acres from the Bay's peak seagrass coverage in 2016 (41,655 acres: the greatest it has ever been estimated – including in the 1950s). TBEP and partners continue to investigate the major drivers causing this loss, and preliminary analyses suggest that increasing watershed-wide hydrologic inputs, persistent summertime algal blooms and poor tidal flushing in OTB, and increasing shallow-water temperatures may be causing stresses that prevent persistent seagrass coverage in upper Tampa Bay segments. As identified in Section 5, several TBEP and TBNMC partner-led initiatives are attempting to better understand the patterns of seagrass loss in upper Tampa Bay and reverse these recent trends.
- Time series plots show that chlorophyll-a thresholds have been consistently met in three of the four major bay segments. In Old Tampa Bay, water quality and seagrass are not meeting

goals. Bay managers continue to evaluate appropriate management actions within the Old Tampa Bay segment to improve its overall ecological integrity and reduce the potential for future chlorophyll-a exceedances in this bay segment. Additional nitrogen load reduction projects across the major source categories are necessary, as well as, complementary restoration activities that will improve water quality and decrease the propensity of future, summertime algal bloom formation. These activities have included tidal circulation, hydrologic and oyster/shellfish restoration. Optimizing the scale and scope of these activities will warrant additional research. TBEP and its partners continue to make significant investments towards implementing projects and directing focused research within this bay segment toward this end.

Nitrogen Management Consortium Partnership Recognition

- Coastal Stewardship Award: 2017 Coastal and Estuarine Research Federation (CERF) Biennial Conference. The TBNMC was recognized for the impressive achievements in all the key criteria considered important in the mission of CERF to promote the wise use of science and management toward the stewardship of estuaries and coasts around the world. The TBNMC partners were further recognized for their commitment towards collaborating to maintain water quality adequate to continue the Tampa Bay ecosystem's recovery.

Appendix 1: Old Tampa Bay allocation assessment for the 2017-2021 Reasonable Assurance period.

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Cheval West	MS4	0.18%	0.7	0.3
City of Clearwater	Point Source - Clearwater East SW		9.3	5.5
	Point Source - Clearwater East RE		0.1	0.0
	Point Source - Clearwater Northeast SW		16.6	6.0
	Point Source - Clearwater Northeast RE		1.1	1.4
	MS4	2.71%	10.6	7.8
	TOTAL		**37.7**	**20.8**
Heritage Harbor	MS4	0.15%	0.6	0.3
Hillsborough County	Point Source - Dale Mabry SW		7.4	0.4
	Point Source - Dale Mabry RE		2.8	0.3
	Point Source - Northwest Regional SW		2.9	10.3
	Point Source - Northwest Regional RE		5.5	6.0
	Point Source - River Oaks SW		13.4	6.4
	Point Source - River Oaks RE		1.6	0.3
	Point Source - Van Dyke RE		0.8	0.9
	MS4	23.34%	91.6	60.1
	TOTAL		**126.0**	**84.7**
City of Largo	Point Source - Largo SW		16.4	23.0
	Point Source - Largo RE		2.6	2.0
	MS4	1.40%	5.5	4.3
	TOTAL		**24.5**	**29.3**
MacDill Air Force Base	MS4	0.09%	0.4	0.3
City of Oldsmar	Point Source - Oldsmar SW		2.7	0.5
	Point Source - Oldsmar RE		0.5	0.4
	MS4	1.38%	5.4	3.7
	TOTAL		**8.7**	**4.6**
On Top of the World	Point Source - OTOTW RE		0.5	0.8
Palm Bay	MS4	0.01%	0.0	0.0

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Park Place	MS4	0.10%	0.4	0.5
Pasco County	MS4	0.44%	1.7	0.9
Pinellas County	Point Source - W.E. Dunn RE		2.3	0.5
	Point Source - Bridgeway Acres SW		1.2	2.8
	MS4	14.66%	57.6	34.3
	TOTAL		**61.1**	**37.6**
City of Pinellas Park	MS4	1.01%	4.0	3.1
City of Safety Harbor	MS4	1.27%	5.0	3.8
City of St. Petersburg	Point Source - St. Pete Facilities RE		4.7	4.9
	MS4	0.88%	3.5	2.7
	TOTAL		**8.2**	**7.6**
Stonebriar	MS4	0.05%	0.2	0.3
City of Tarpon Springs	MS4	0.41%	1.6	0.7
City of Tampa	MS4	5.30%	20.8	16.0
Westchase	MS4	0.36%	1.4	1.1
Westchase East	MS4	0.43%	1.7	1.3
Duke Energy Bartow	Point Source		3.0	1.2

Appendix 2: Hillsborough Bay allocation assessment for the 2017-2021 Reasonable Assurance period.

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Busch Gardens	Point Source – Busch Gardens SW		1.0	0.6
ZooTampa	Point Source - Lowry Park SW		1.0	0.1
Hillsborough County	Point Source - Falkenburg SW		15.2	15.6
	Point Source - Falkenburg RE		2.8	3.6
	Point Source - Pebble Creek SW		0.3	0.0
	Point Source - Pebble Creek RE		0.1	0.0
	Point Source - South County SW		1.8	4.7
	Point Source - Valrico SW		5.6	4.4
	Point Source - Valrico RE		5.0	6.2
	MS4	22.60%	235.6	161.5
	TOTAL		**266.5**	**196.0**
City of Lakeland	Point Source - Lakeland SW		20.0	8.0
	Point Source - Lakeland RE		0.2	0.0
	MS4	1.05%	10.9	9.3
	TOTAL		**31.1**	**17.3**
City of Mulberry	Point Source - Mulberry SW		2.4	1.1
	MS4	0.20%	2.1	1.9
	TOTAL		**4.5**	**3.0**
Pasco County	Point Source - Master Reuse System RE		5.8	2.8
	MS4	3.69%	38.4	20.2
	TOTAL		**44.2**	**23.0**
City of Plant City	Point Source - Plant City SW		9.5	5.0
	Point Source - Plant City RE		1.0	0.6
	MS4	0.88%	9.2	7.1
	TOTAL		**19.7**	**12.7**
Polk County	Point Source - Northwest Regional RE		0.6	0.2
	Point Source - Southwest Regional RE		1.1	0.8
	MS4	6.47%	67.5	52.8

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
	TOTAL		**69.3**	**53.8**
City of Tampa	Point Source - HF Curren SW		212.2	215.4
	Point Source - HF Curren RE		1.0	4.1
	MS4	4.80%	50.0	33.9
	TOTAL		**263.2**	**253.4**
City of Zephyrhills	Point Source - Zephyrhills RE		3.0	1.6
	MS4	0.16%	1.6	0.8
	TOTAL		**4.6**	**2.4**
CSX	Point Source - Rockport Material Losses		5.6	1.1
	Point Source - Winston Yard		3.0	0.0
	Point Source - Rockport		6.0	4.7
	Point Source – Rockport/Newport (fka Eastern Terminals			
	Point Source - Newport Material Losses (fka Eastern)		5.6	0.7
	TOTAL		**20.3**	**6.6**
Kinder Morgan	Point Source - Port Sutton Material Losses		1.8	0.2
	Point Source - Tampaplex Material Losses		3.4	
	Point Source - Tampaplex Bulk Terminal		25.0	12.0
	Point Source - Hartford Terminal*			
	Point Source - Port Sutton*			
	TOTAL		**30.2**	**12.2**
Kerry I&F Contracting	Point Source*		1.8	1.3
Tampa Bay Water	Point Source		1.5	0.0
Mosaic	Point Source - Riverview Material Losses		9.9	3.8
	Point Source - Tampa Marine (fka CF) Material Losses			
	Point Source – Big Bend Material Losses			
	Point Source - Bonnie (fka CF Bartow)	12.00%	123.8	3.1
	Point Source - Plant City (fka CF)			3.9
	Point Source - Tampa Ammonia Terminal (fka CF)			0.1
	Point Source - Tampa Marine (fka CF Phosphate Warehouse)			0.2
	Point Source - Bartow			1.8

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
	Point Source - Ft. Lonesome			17.2
	Point Source - Green Bay			3.5
	Point Source - Hookers Prairie			0.0
	Point Source - Hopewell			0.0
	Point Source - Kingsford			0.1
	Point Source - Mulberry			0.0
	Point Source - New Wales Stack Closure			0.0
	Point Source - Nichols Mine			0.9
	Point Source - Riverview			1.1
	Point Source - Riverview Stack Closure			0.1
	Point Source - Port Sutton Ammonia Terminal*			0.1
	Point Source - South Pierce			9.9
	Point Source – Mulberry Phosphogypsum Stack			1.4
	Point Source – New Wales Chemical Plant			10.8
	TOTAL		**133.7**	**57.9**
Agrifos	Point Source - Nichols Prep Plant	0.00%	0.0	0.0
Brewster Phosphogypsum	Point Source - Brewster Phosphogypsum	0.10%	1.0	0.1
Alpha/Owens Corning	Point Source - Alpha/Owens Corning	0.10%	1.0	0.0
Coronet Industries	Point Source - Coronet Industries	0.45%	4.7	1.0
Estech Agricola	Point Source - Estech Agricola	0.25%	2.6	0.8
Exxon Mobil	Point Source - Exxon Mobil	0.16%	1.7	0.0
TECO Bayside	Point Source - TECO Bayside	0.07%	0.8	0.3
Trademark Nitrogen	Point Source - Trademark Nitrogen	0.00%	0.0	0.1
Yara North America	Point Source - Yara North America	0.03%	0.3	0.1
Alafia Preserve	Nonpoint Source/MS4	0.06%	0.6	0.4
Bloomingdale	Nonpoint Source/MS4	0.00%	0.0	0.1
Donaldson Knoll	Nonpoint Source /MS4	0.01%	0.1	0.1
Eagle Ridge	Nonpoint Source/MS4	0.07%	0.7	0.6
Lake St. Charles	Nonpoint Source/MS4	0.04%	0.4	0.4
Live Oak I	Nonpoint Source/MS4	0.02%	0.2	0.1

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Live Oak II	Nonpoint Source/MS4	0.01%	0.1	0.1
Magnolia Park	Nonpoint Source/MS4	0.00%	0.1	0.4
MacDill Air Force Base	Nonpoint Source/MS4	0.07%	0.7	0.8
Palm River	Nonpoint Source/MS4	0.00%	0.0	0.1
Panther Trace	Nonpoint Source/MS4	0.03%	0.3	0.4
Panther Trace II	Nonpoint Source/MS4	0.02%	0.2	0.7
Rivercrest	Nonpoint Source/MS4	0.03%	0.3	0.5
City of San Antonio	Nonpoint Source/MS4	0.03%	0.3	0.2
Spring Lake	Nonpoint Source/MS4	0.01%	0.1	0.2
St. Leo	Nonpoint Source/MS4	0.00%	0.0	0.0
Stone Crest	Nonpoint Source/MS4	0.00%	0.0	0.0
Stone Dairy Creek	Nonpoint Source/MS4	0.00%	0.0	0.0
Stonelake Ranch	Nonpoint Source/MS4	0.00%	0.0	0.1
City of Temple Terrace	Nonpoint Source/MS4	0.20%	2.1	1.0

*Interim Allocation, as identified in the 2009 RA Addendum and 2012 and 2017 RA Updates

Appendix 3: Middle Tampa Bay allocation assessment for the 2017-2021 Reasonable Assurance period.

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Harbor Bay	MS4	0.03%	0.2	0.5
Hillsborough County	Point Source - South County RE		0.5	1.5
	MS4	9.91%	70.9	74.6
	TOTAL		**71.4**	**76.1**
MacDill Air Force Base	Point Source - MacDill AFB RE		0.7	0.6
	MS4	0.97%	7.0	2.8
	TOTAL		**7.7**	**3.4**
Manatee County	MS4	3.05%	21.8	19.3
Pinellas County	MS4	0.45%	3.2	0.7
City of Pinellas Park	MS4	0.74%	5.3	2.4
City of St. Petersburg	Point Source - St. Pete Facilities RE		20.8	21.5
	MS4	6.49%	46.5	15.7
	TOTAL		**67.3**	**37.2**
Mosaic	Point Source - Four Corners	4.09%	29.3	32.8
TECO Big Bend	Point Source - Big Bend SW*		56.5	25.5
	Point Source - Big Bend RE		2.1	0.0
	TOTAL		**58.6**	**25.5**

*Interim Allocation, as identified in the 2009 RA Addendum and 2012 and 2017 RA Updates

Appendix 4: Lower Tampa Bay allocation assessment for the 2017-2021 Reasonable Assurance period.

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
Hillsborough County	MS4	0.01%	0.0	0.0
Lexington	MS4	0.04%	0.1	0.1
Manatee County	Point Source - Manatee County North RE		3.9	4.8
	Point Source - Manatee County North SW		0.0	0.0
	MS4	7.81%	26.8	15.3
	TOTAL		**30.7**	**20.1**
City of St. Petersburg	MS4	0.01%	0.0	0.0
Kinder Morgan Port Manatee	Point Source - Material Losses		0.3	0.2
Piney Point Facility*, **	Point Source - Piney Point		0.9	2.4

*Interim Allocation, as identified in the 2009 RA Addendum and 2012 and 2017 RA Updates

**Assessment does not include Emergency Discharges from Mar-Apr 2021

Appendix 5: Remainder of Lower Tampa Bay allocation assessment for the 2017-2021 Reasonable Assurance period.

Entity	Source	% Allocation (Based on Percentage of Remaining Load)	Allocated TMDL Load (tons/yr)	Mean 2017-2021 Loads (tons/yr), Entities/Facilities with % Allocations Hydrologically Normalized BASIN
City of Bradenton	Point Source - Bradenton SW		18.6	31.0
	Point Source - Bradenton RE		0.6	12.6
	MS4	1.82%	10.8	7.1
	TOTAL		**30.0**	**50.7**
City of Gulfport	MS4	0.37%	2.2	1.1
Greyhawk Landing	MS4	0.14%	0.8	0.8
Harbourage at Braden River	MS4	0.00%	0.0	0.1
Heritage Harbour	MS4	0.14%	0.8	0.8
Heritage Harbour Marketplace	MS4	0.02%	0.1	0.1
Lakewood Ranch	MS4	1.47%	8.7	6.3
Lexington	MS4	0.02%	0.1	0.1
Manatee County	Point Source - Southeast RE		2.7	8.8
	MS4	21.95%	130.2	87.2
	TOTAL		**132.9**	**96.0**
Pinellas County	MS4	0.18%	1.1	0.5
City of Palmetto	Point Source - Palmetto SW		2.2	0.7
	Point Source - Palmetto RE		1.0	0.0
	MS4	0.77%	4.6	3.2
	TOTAL		**7.7**	**3.9**
Sarasota County	MS4	1.38%	8.2	3.9
City of St. Petersburg Beach	MS4	0.21%	1.2	0.7
City of St. Petersburg	Point Source - St. Pete Facilities RE		1.6	1.6
	MS4	1.27%	7.5	3.5
	TOTAL		**9.1**	**5.1**
Tara	MS4	0.18%	1.1	0.6
University Place	MS4	0.11%	0.6	0.4
Waterlefe	MS4	0.10%	0.6	0.4
Tropicana*	Point Source - Tropicana SW		9.1	0.0

*Interim Allocation, as identified in the 2009 RA Addendum and 2012 and 2017 RA Updates

Appendix 6: Nitrogen (left) and phosphorus (right) delivery ratios [i.e. total nitrogen or total phosphorus load (tons/yr) per unit water (million m3) delivered] to each of the major bay segments. The 1992-1994 ratio targets are shown in parentheses in the column headers (left nitrogen, right phosphorus) for each bay segment and represent the arithmetic mean of those years. The 1992-1994 arithmetic mean ratio targets have been adopted by FDEP and accepted by EPA as the numeric nutrient criteria for the major bay segments. These bay segments have been established as FDEP Estuary Nutrient Regions. The Remainder Lower Tampa Bay segment is inclusive of the Boca Ciega Bay South, Terra Ceia Bay, and Manatee River segments.

Year	Old Tampa Bay (1.08 / 0.23)	Hillsborough Bay (1.62 / 1.28)	Middle Tampa Bay (1.24 / 0.24)	Lower Tampa Bay (0.97 / 0.14)	Remainder Lower Tampa Bay (1.59 / 0.52)	Boca Ciega Bay South (0.97 / 0.06)	Terra Ceia Bay (1.1 / 0.14)	Manatee River (1.8 / 0.37)
1985	0.91 / 0.64	1.9 / 1.81	0.81 / 0.55	0.82 / 0.93	1.14 / 0.46	0.63 / 0.58	0.91 / 0.56	1.34 / 0.41
1986	1.02 / 0.64	1.78 / 1.34	1.01 / 0.55	0.95 / 0.87	1.2 / 0.48	0.82 / 0.58	1.04 / 0.56	1.37 / 0.43
1987	1.11 / 0.62	2.3 / 1.51	1.24 / 0.56	0.94 / 0.73	1.2 / 0.48	0.87 / 0.59	1.09 / 0.56	1.32 / 0.43
1988	1.06 / 0.64	1.8 / 1.47	1.16 / 0.51	0.74 / 0.75	1.24 / 0.46	0.77 / 0.49	1.01 / 0.52	1.43 / 0.45
1989	1.12 / 0.56	2.01 / 1.93	1.21 / 0.54	1.23 / 0.75	1.58 / 0.5	1.05 / 0.59	1.34 / 0.55	1.78 / 0.47
1990	1.02 / 0.57	2.17 / 2.33	1.19 / 0.53	1.09 / 0.72	1.49 / 0.53	1.03 / 0.59	1.23 / 0.56	1.76 / 0.5
1991	1.03 / 0.54	1.89 / 1.54	1.1 / 0.55	0.96 / 0.71	1.68 / 0.48	0.89 / 0.59	1.15 / 0.56	1.96 / 0.44
1992	1.01 / 0.58	1.77 / 1.68	1.21 / 0.58	0.88 / 0.72	1.51 / 0.48	0.79 / 0.6	1.04 / 0.54	1.76 / 0.44
1993	1.08 / 0.58	1.52 / 1.55	1.06 / 0.54	1 / 0.68	1.39 / 0.47	0.96 / 0.59	1.12 / 0.57	1.55 / 0.42
1994	1.15 / 0.57	1.62 / 0.95	1.38 / 0.58	1.05 / 0.69	1.76 / 0.62	1 / 0.58	1.14 / 0.54	2.09 / 0.64
1995	0.96 / 0.4	1.49 / 1.23	1.08 / 0.41	0.67 / 0.38	1.51 / 0.45	0.79 / 0.35	0.93 / 0.36	1.74 / 0.48
1996	0.93 / 0.37	1.46 / 0.99	0.95 / 0.35	0.66 / 0.3	1.09 / 0.35	0.71 / 0.28	0.92 / 0.3	1.23 / 0.38
1997	0.98 / 0.2	1.58 / 1.97	1.07 / 0.18	0.86 / 0.08	1.45 / 0.33	0.84 / 0.05	0.99 / 0.12	1.63 / 0.42
1998	1.04 / 0.23	1.56 / 0.99	1.09 / 0.23	1.05 / 0.13	1.42 / 0.4	0.88 / 0.05	1.02 / 0.13	1.55 / 0.48
1999	0.88 / 0.33	1.62 / 1.14	0.95 / 0.14	0.7 / 0.04	1.41 / 0.25	0.76 / 0.04	0.89 / 0.09	1.62 / 0.33
2000	0.96 / 0.26	1.63 / 1.2	1.04 / 0.14	0.76 / 0.04	1.36 / 0.25	0.9 / 0.05	0.88 / 0.09	1.62 / 0.36
2001	0.88 / 0.21	1.59 / 1.14	1.07 / 0.25	0.63 / 0.07	1.46 / 0.32	0.76 / 0.07	0.97 / 0.15	1.62 / 0.38
2002	0.89 / 0.19	1.49 / 1.03	0.96 / 0.15	0.61 / 0.04	1.19 / 0.25	0.67 / 0.04	0.81 / 0.08	1.39 / 0.34
2003	1.07 / 0.24	1.57 / 1.1	1.19 / 0.24	0.9 / 0.07	1.42 / 0.33	0.89 / 0.06	1.08 / 0.15	1.51 / 0.38
2004	0.94 / 0.21	1.72 / 1.14	1.01 / 0.25	0.65 / 0.08	1.25 / 0.26	0.72 / 0.08	0.9 / 0.13	1.39 / 0.31
2005	0.86 / 0.22	1.3 / 0.93	0.9 / 0.21	0.62 / 0.06	1.24 / 0.26	0.62 / 0.05	0.78 / 0.1	1.39 / 0.31
2006	0.85 / 0.19	1.93 / 1.09	0.93 / 0.18	0.59 / 0.05	1.28 / 0.25	0.6 / 0.05	0.83 / 0.11	1.46 / 0.31
2007	0.8 / 0.19	1.33 / 0.97	0.92 / 0.12	0.62 / 0.04	1.12 / 0.23	0.67 / 0.04	0.82 / 0.08	1.38 / 0.35
2008	0.87 / 0.15	1.37 / 0.9	0.85 / 0.14	0.52 / 0.04	0.69 / 0.16	0.28 / 0.02	0.73 / 0.09	1.04 / 0.29
2009	0.9 / 0.14	1.41 / 0.73	0.96 / 0.16	0.56 / 0.05	0.84 / 0.2	0.29 / 0.02	0.77 / 0.09	1.19 / 0.32
2010	0.98 / 0.16	1.41 / 0.71	0.97 / 0.13	0.62 / 0.05	0.89 / 0.19	0.32 / 0.02	0.84 / 0.1	1.23 / 0.31

Year	Old Tampa Bay (1.08 / 0.23)	Hillsborough Bay (1.62 / 1.28)	Middle Tampa Bay (1.24 / 0.24)	Lower Tampa Bay (0.97 / 0.14)	Remainder Lower Tampa Bay (1.59 / 0.52)	Boca Ciega Bay South (0.97 / 0.06)	Terra Ceia Bay (1.1 / 0.14)	Manatee River (1.8 / 0.37)
2011	0.89 / 0.15	1.36 / 0.58	0.96 / 0.11	0.52 / 0.04	0.71 / 0.16	0.27 / 0.02	0.71 / 0.08	1.18 / 0.31
2012	0.82 / 0.15	1.27 / 0.63	0.84 / 0.16	0.37 / 0.04	1.05 / 0.27	0.62 / 0.07	0.73 / 0.11	1.19 / 0.33
2013	0.84 / 0.15	1.23 / 0.57	0.88 / 0.14	0.46 / 0.04	1.07 / 0.27	0.69 / 0.07	0.79 / 0.11	1.17 / 0.32
2014	0.79 / 0.14	1.15 / 0.57	0.82 / 0.13	0.48 / 0.03	0.99 / 0.25	0.62 / 0.05	0.76 / 0.09	1.1 / 0.31
2015	0.95 / 0.15	1.22 / 0.68	0.91 / 0.16	0.55 / 0.04	1.08 / 0.25	0.69 / 0.05	0.8 / 0.1	1.22 / 0.32
2016	0.82 / 0.13	1.23 / 0.69	0.89 / 0.16	0.48 / 0.04	1.11 / 0.27	0.61 / 0.05	0.85 / 0.12	1.23 / 0.33
2017	0.74 / 0.12	1.29 / 0.96	0.78 / 0.18	0.43 / 0.04	1.28 / 0.3	0.48 / 0.04	0.77 / 0.12	1.37 / 0.34
2018	0.77 / 0.11	1.24 / 0.76	0.76 / 0.17	0.49 / 0.03	1.18 / 0.27	0.55 / 0.04	0.68 / 0.08	1.32 / 0.33
2019	0.82 / 0.13	1.2 / 0.57	0.79 / 0.15	0.45 / 0.04	1.08 / 0.25	0.56 / 0.05	0.76 / 0.11	1.23 / 0.31
2020	0.74 / 0.12	1.15 / 0.62	0.81 / 0.13	0.5 / 0.04	1.03 / 0.25	0.53 / 0.04	0.71 / 0.09	1.15 / 0.3
2021	0.75 / 0.14	1.27 / 0.62	0.8 / 0.17	1.09 / 0.48	1 / 0.26	0.49 / 0.04	0.69 / 0.09	1.12 / 0.31