Assessment Methodology for the 2016 United States Virgin Islands Integrated Water Quality Monitoring and Assessment Report

This document was prepared pursuant to Section 303(d) of the Federal Clean Water Act

January, 2016

Contents

Introduction:

1.0 Background

The Clean Water Act requires each state to conduct water quality surveys to determine if its waters are healthy and have sufficient quality to meet their designated uses and attain water quality standards. A report on this water quality assessment is submitted every two years to US Environmental Protection Agency – Region 2. The U.S. Environmental Protection Agency (USEPA) encourages states to adopt the Integrated Reporting format which blends elements of the 305(b) Water Quality Assessment Report and the 303(d) Impaired Waterbody List. The United States Virgin Islands Department of Planning and Natural Resources (DPNR-DEP) uses this format to more accurately and completely assess USVI's waterbodies.

States are required to submit, for USEPA and public review, the methods used to collect, analyze, and interpret data to determine compliance with applicable water quality standards and assess support of the applicable designated uses. This Method document serves that function by providing an objective and scientifically sound assessment methodology.

2.0 Comprehensive Assessment:

2.1 Identification of Waterbody Type:

All waters of the U.S. Virgin Islands shall meet generally accepted aesthetic qualifications and shall be capable of supporting diversified aquatic life. The waters within the jurisdiction of the United States Virgin Islands include: all harbors, streams, lakes, ponds, impounding reservoirs, marshes, water-courses, water-ways, wells, springs, irrigation systems, drainage systems and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, situated wholly or partly within or bordering upon the United States Virgin Islands, including the territorial seas, contiguous zones, and oceans. Assessments of these "waters" shall be included in the U.S. Virgin Islands 2016 Integrated Report. All available groundwater data will be reviewed for possible inclusion in the report and the Division of Environmental Protection's Groundwater Program will provide groundwater discussion in the 2016 Integrated Report.

2.2 Identification of waterbody classification and designated use:

According to the 2010 US Virgin Islands Water Quality Standards (WQS), the waters of the Virgin Islands exist in one of three classes: A, B and C. The geographical extent of the three waterbody classes, and the applicable water quality standards are found at the following website:

http://dpnr.vi.gov/environmental-protection/water-quality-management/

Class "A" Waters

Best usage of waters: Preservation of natural phenomena requiring special conditions, such as the Natural Barrier Reef at Buck Island, St. Croix and the Under Water Trail at Trunk Bay, St. John. These are outstanding natural resource waters that cannot be altered except towards natural conditions. No new or increased dischargers shall be permitted.

Water quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.

Assessing Class A Waters When Insufficient Data Exits to Determine Natural Conditions in the Class A Water:

Currently there is insufficient information to determine natural conditions in Class A waters. The phrase "In no case shall Class B Water Quality Standards be exceeded" within the narrative water quality criteria for Class A waters is interpreted to mean that until sufficient data is available to determine natural conditions in Class A waters, in no case shall Class B numeric water quality criteria be exceeded in Class A waters. Data continues to be collected to determine natural conditions in Class A waters. Until such time as natural conditions are determined for a particular Class A water: (1) if data indicate that all Class B numeric water quality criteria are not exceeded in a Class A water, that Class A water will be placed into Category 3 for insufficient information to determine attainment status; and (2) if data indicate that any Class B numeric water quality criteria are exceeded in a Class A water, that Class A water will be placed into Category 5 as impaired for the pollutant(s) causing the exceedance(s).

Class "B" Waters.

Best usage of waters: For maintenance and propagation of desirable species of aquatic life (including threatened, endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows minimal changes in structure of the biotic community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes in biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

(1) All other waters not classified as Class "A" or Class "C".

(A) Those Class "B" waters not covered by color and turbidity criteria in section 186-3(b)(11) of this chapter include:

(i) St. Thomas waters-Mandahl Bay (Marina), Vessup Bay, Water Bay, Benner Bay, and the Mangrove Lagoon.

(ii) St. Croix waters-Carlton Beach, Good Hope Beach, Salt River Lagoon

(Marina), Salt River Lagoon (Sugar Bay), Estate Anguilla Beach, Buccaneer Beach, Tamarind Reef Lagoon, Green Cay Beach and Enfield Green Beach.
(iii) All non-marine waters defined as all Virgin Islands waters shoreward of the mean high-tide line.

(B) All other Class "B" waters are covered by the color and turbidity criteria in section 186-3(b)(11)(B) of this subchapter.

Class "C" Waters

Best usage of waters: For maintenance and propagation of desirable species of aquatic life (including threatened and endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows for evident changes in structure of the biotic community and minimal changes in ecosystem function. Evident changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa (community structure) are allowed but sensitive-ubiquitous taxa remain common and abundant; ecosystem functions are fully maintained through redundant attributes of the system.

2.3 Monitored Waters:

Island	# of Assessment Units (AUs)	# of AUs each Class of Water falls under			AUs Monitored (% of Total)
	Total	Class A	Class B	Class C	
St. Croix	84	1	40	6	47 (56%)
St. Thomas	59	0	43	3	46 (78%)
St. John	33	0	21	1	22 (66%)

* AUs not monitored were either missed during monitoring events or currently do not have monitoring locations within them

2.4 Unmonitored Waters:

Currently DPNR and EPA are discussing options for assessing the following unmonitored waters, and intend to implement it by the 2020 Integrated Report. It is our goal to assess and characterize the condition of all waters in the United States Virgin Islands. The following unmonitored waters have not been assessed since there are no monitoring stations located within these assessment units:

Class A unmonitored waters:

VI-STC-42 Buck Island Forereef

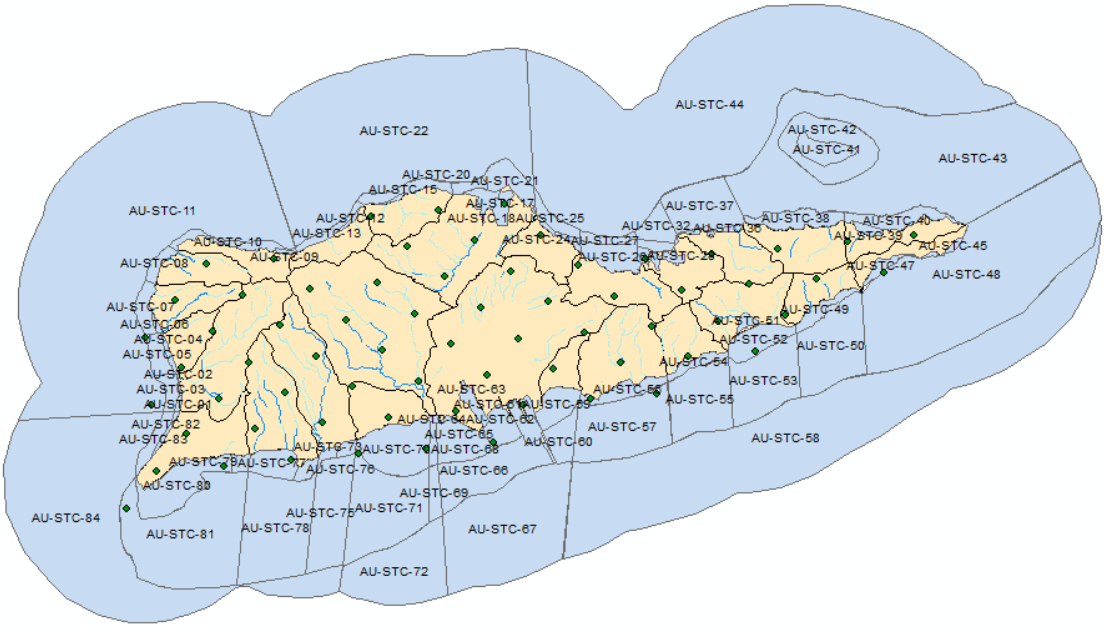
Class B unmonitored waters:

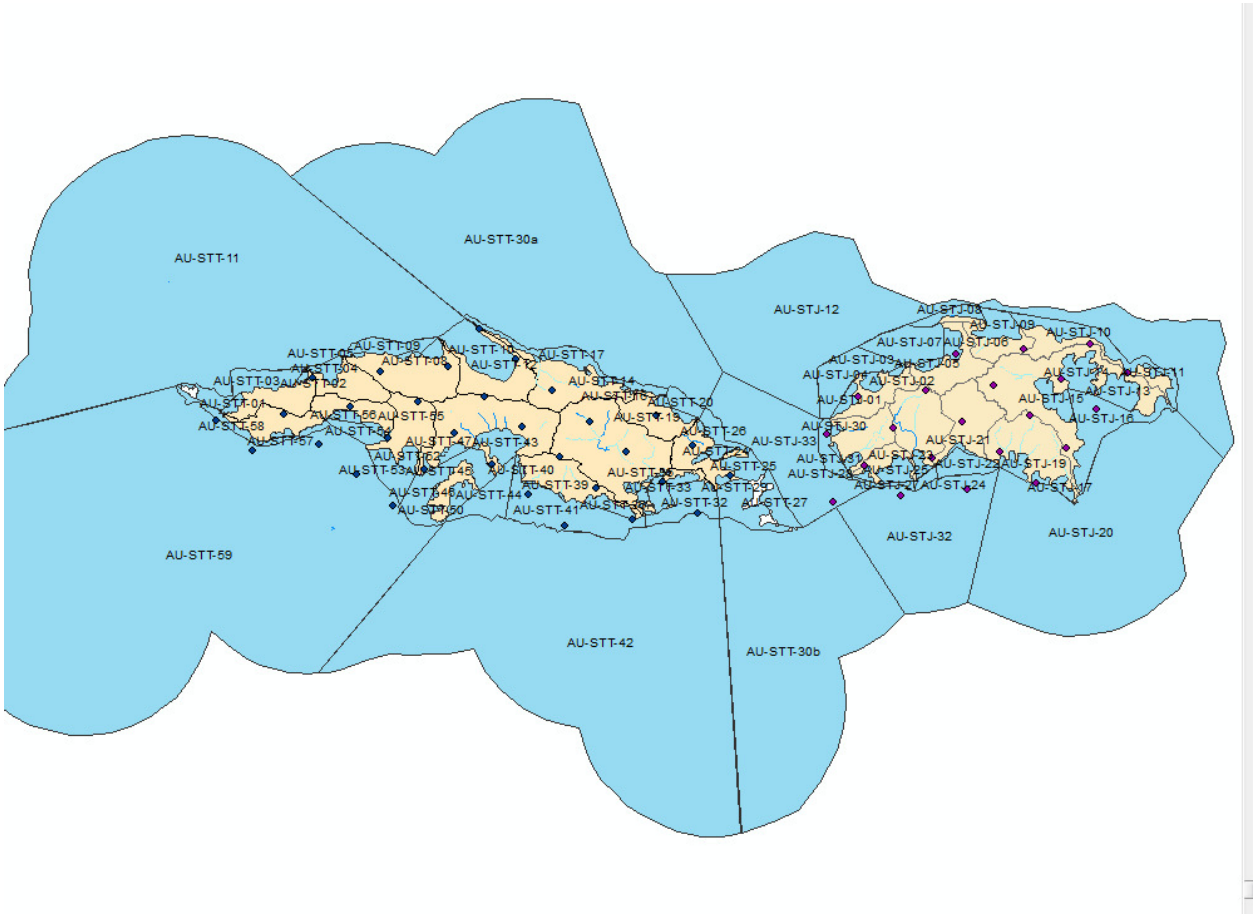
VI-STT-03 Botany Bay subwatershed offshore
VI-STT-09 Dorothea Bay subwatershed offshore
VI-STT-12 Lovenlund Bay
VI-STT-14 Tutu Bay
VI-STT-20 Smith Bay subwatershed, offshore
VI-STT-26 Red Hook Bay, offshore
VI-STT-27 St. James Islands, offshore
VI-STT-29 St. James Bay
VI-STT-30B Northeast St. Thomas HUC14, offshore south
VI-STT-33 Benner Bay
VI-STT-41 Frenchman Bay
VI-STT-44 St. Thomas Harbor, outer
VI-STT-48 Water Isle Hotel, Beach
VI-STT-58 Fortuna Bay subwatershed, offshore
VI-STJ-07 Maho Bay subwatershed, offshore
VI-STJ-08 Mary Point
VI-STJ-11 Newfound Bay
VI-STJ-14 Hurricane Hole
VI-STJ-18 Grootman Bay
VI-STJ-22 Genti Bay, offshore
VI-STJ-24 Fish Bay subwateshed, offshore
VI-STC-54 Leprey Valley Backreef
VI-STC-55 Leprey Vally subwatershed, offshore
VI-STC-57 Bugby Hole subwatershed, offshore
VI-STC-60 Canegarden Bay, offshore
VI-STC-66 Hovensa subwatershed, offshore
VI-STC-68 Bethlehem subwatershed, inshore
Vi-STC-69 Bethlehem subwatershed, offshore
VI-STC-70 Airport, nearshore
VI-STC-72 Airport St. Croix HUC14, offshore
VI-STC-73 Diamond, nearshore
VI-STC-74 Enfield Green Beach/VIRIL outfall
VI-STC-77 Long Point Bay
VI-STC-80 Sandy Point, nearshore south
VI-STC-81 Sandy Point, offshore south
VI-STC-83 Sandy Point, offshore west
VI-STJ-27 Redezvous Bay subwatershed, offshore
VI-STC-01 Frederiksted, south
VI-STC-03 Lagrange subwatershed, offshore
VI-STC-05 Prosperity subwatershed, offshore
VI-STC-07 Creque Dam/Butler Bay
VI-STC-08 Hams Bay
VI-STC-09 Davis Bay
VI-STC-10 Hams Bluff
VI-STC-14 Belvedere
VI-STC-15 Northside subwatershed
VI-STC-17 Salt River Lagoon, Sugar Bay
VI-STC-19 Judith Fance
VI-STC-20 Salt River Bay subwatershed, west
VI-STC-21 Salt River Bay subwatershed, east
VI-STC-28 Altona Lagoon
VI-STC-32 Altona Lagoon subwatershed, offshore
VI-STC-34 Punnet Point, east
VI-STC-38 Solitude Backreef
VI-STC-43 Solitude and Teague Bay subwatershed, offshore
VI-STC-45 Isaac Bay
VI-STC-51 Great Pond

The following unmonitored waters have not been assessed due to the fact that, while they do have monitoring stations within them, their respective monitoring stations were not sampled the minimum number of times required to provide a data set that adequately represents water quality conditions:

Class B monitored waters:

VI-STT-11 Northwest STT, offshore
VI-STT-30a Northeast STT, offshore
VI-STT-42 Southeast STT, offshore
VI-STT-59 Southwest STT, offshore
VI-STJ-12 North STJ, offshore
VI-STJ-20 Southeast STJ, offshore
VI-STJ-32 Southwest STJ, offshore
VI-STJ-33 Pillsbury Sound
VI-STC-11 Northwest STX, offshore
VI-STC-22 North central STX, offshore
VI-STC-44 Northeast STX, offshore
VI-STC-48 Turner Hole subwatershed, offshore
VI-STC-50 Madam Carty, offshore
VI-STC-53 Great Pond Bay subwatershed, offshore
VI-STC-58 Southeast STX, offshore
VI-STC-67 Southports STX, offshore
VI-STC-71 Airport, offshore
VI-STC-78 Long Point Bay subwatershed, offshore
VI-STC-84 Southwest STX, offshore





3.0 Use and Interpretation of Data:

3.1 Inventory of physical, chemical and microbiological data:

The inventory of physical, chemical and microbiological data used to develop the 2016 Integrated Report and make water quality assessments are StoRet data extracts from fiscal years 2013-2015 (July 1, 2013 to September 30, 2015) from the Ambient and Beach Water Quality Monitoring Programs. The parameters used to perform the assessments are parameters which were analyzed by the Ocean Systems Laboratory, University of the Virgin Islands' Environmental Analysis Laboratory, Pace Analytical Laboratory and USEPA Region II Laboratory. These parameters include: Fecal Coliform, Enterococci, Turbidity, pH, Dissolved Oxygen and Total Phosphorus.

3.1.1 Evaluation of Internal Data

The Division of Environmental Protection's Coastal Water Quality (Ambient) Monitoring Program is managed by the Water Quality Management Program (WQMP). Through the Coastal Water Quality Monitoring Program, ambient water quality is monitored on a quarterly basis.

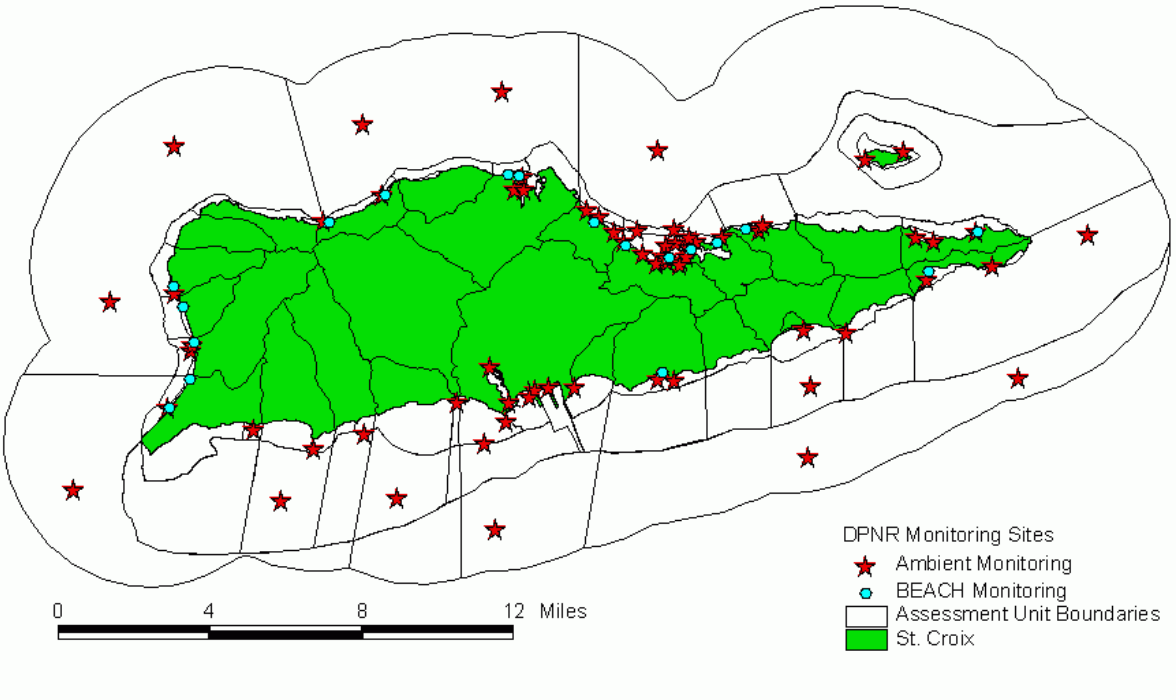
Through an In-Kind Assistance Agreement, a USEPA contractor was responsible for conducting quarterly Ambient Monitoring during FY14-15.

Ambient (Coastal Water Quality) Data was collected for 3 quarters throughout the Territory during FY2014 & 4 quarters during FY2015 by an EPA-selected contractor. DPNR will use the most recent data, but for an adequate data set for assessment, the department will review the last quarter of ambient monitoring from FY2013 giving a total evaluation of eight (8) quarters of monitoring data. All listing and delisting decisions will be provided in the 303(d) list narrative under the delisting justification or new listing sections.

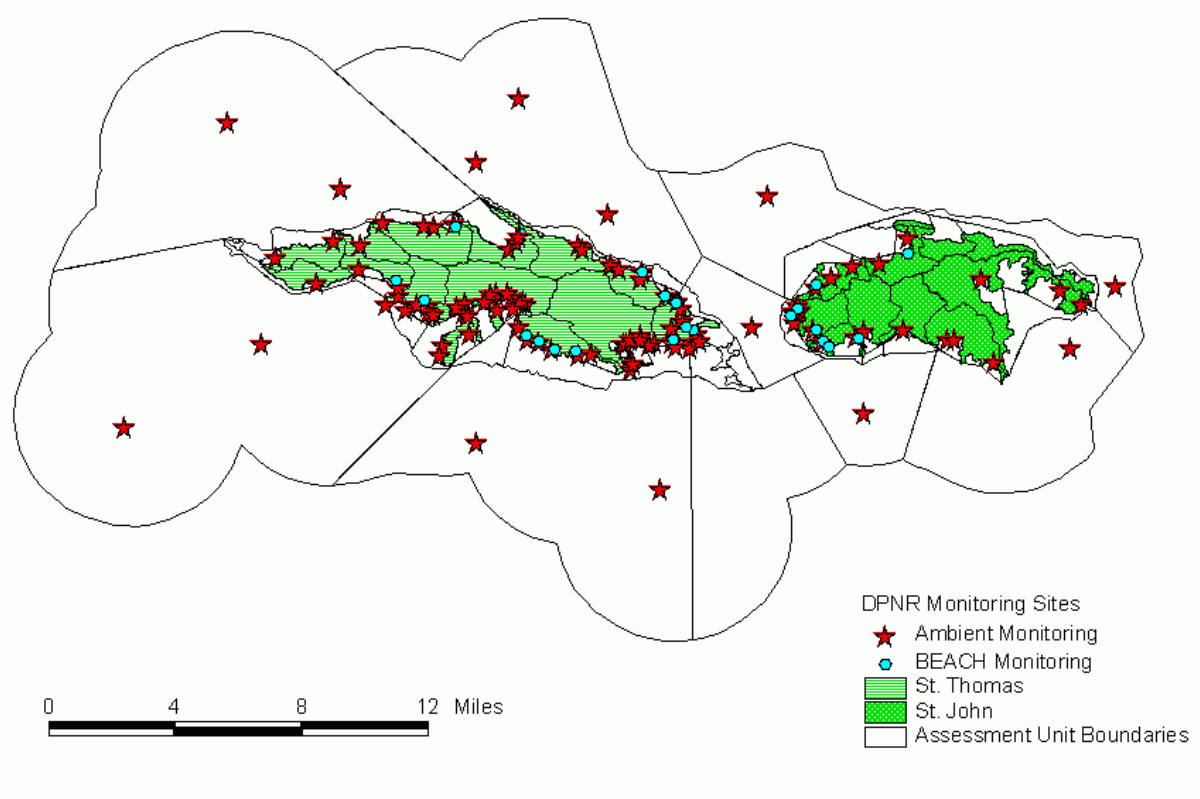
Ambient Data Evaluated		
Fiscal Year	**No. of Quarters Evaluated**	**Date of Quarters**
2013	1	4th Quarter
2014	3	1st Quarter, 3rd Quarter, 4th Quarter
2015	4	1st Quarter, 2nd Quarter, 3rd Quarter, 4th Quarter

WQMP also monitors designated recreational beaches on a weekly basis through the Beach Water Quality Monitoring Program. The Beach Water Quality Monitoring Program collected weekly samples at 43 designated beaches throughout the Territory for FY2014 and FY 2015 which were analyzed for Enterococci Bacteria and Turbidity (analyzed at the lab).. The data used for assessments were uploaded to the StoRet Database via the Water Quality Exchange. The figures below display DPNR's monitoring locations for its Ambient and Beach Programs:

St. Croix Water Quality Monitoring Network



St. Thomas/St. John Water Quality Monitoring Network



3.1.2 Evaluation of External Data:

DPNR will consider data received during its Data Solicitation period for the submission of the draft 303(d) Total Maximum Daily Load List. All data received will be reviewed for credibility and if determined to be of high quality and of great significance it may be added as an appendix. Otherwise, the data received after solicitation process will be considered during the next cycle. Other data sources refer to any data that was collected outside of the US Virgin Islands Department of Planning & Natural Resources.

In addition to the Data Solicitation request, which was public noticed on November 2, 2015 and ended on December 2, 2015, the following agencies were contacted to request data during the Data Solicitation Period. The agencies were asked to submit all relative monitoring data for the monitoring period with the associated Quality Assurance Project Plan: UVI-CES, USEPA, National Park Service, NOAA/National Undersea Research Program, National Marine Fisheries Service, USGS/GSA Center, USFW/PR Field Office, UVI-CMES, TNC, UVI-CMAS, USVI DOH-EH, USDS/NRCS and NOAAs Coral Reef Conservation Program, OCRM.

When data from other sources are received the QAPP and data would be evaluated to determine if DPNR's Data Quality Objectives were met. If the data is determined to be acceptable then the data would be used in the reporting cycle's assessments. A rationale for any decision to not use

any existing and readily available data and information would also be included in the Integrated Report. DPNR, however, did not receive data from external sources during the data solicitation period for the FY2014 and 2015 reporting cycle.

DPNR also intends to develop a Standard Operating Procedure for the evaluation of secondary data which will clearly articulate acceptance criteria, to be implemented in the 2020 Integrated Report. That criteria once developed will be incorporated into the relative version of the Assessment Methodology.

3.2 Habitat assessment data inventory:

The US Virgin Islands Division of Fish and Wildlife has been identified as a possible data source for habitat assessments. However, there is no habitat assessment data available at this time. If data is available in the future it will be included in future water quality assessment reports.

3.3 Visual Data Sources:

The Department of Planning and Natural Resources, Division of Environmental Protection keeps a log of all incidents of oil spills, fish kills and other events that had a negative impact on the water quality in the US Virgin Islands. It was determined that there were no visual data sources to be reported on or included for this reporting cycle.

3.4 Identify exceedances of water quality standards:

The US Virgin Islands water quality standards set limits for various criteria. All readily available data that meet quality assurance/quality control requirements will be compared to the limits set by the USVI water quality standards to determine which waterbodies exceed these limits.

During this reporting cycle the parameters listed below were assessed in the following manner:

Parameter	Source Data Type	Assessment Method
Enteroccoci	Ambient	Shall not exceed single sample max of 104/100ml
	Beach	Shall not exceed geometric mean of 35/100mL on quarterly basis
Fecal Coliform	Ambient	Class A, B: Shall not exceed a geometric mean of 70/100ml Class C: Shall not exceed a geometric mean of 200/100ml
Turbidity	Ambient	Class A, B: shall not exceed 3NTU (in-situ reading) and secchi disk reading of minimum of 1 meter; Class C: secchi disk reading of minimum of 1 meter
	Beach	Lab reading averaged on quarterly basis shall not exceed 3 NTU
Total Phosphorus	Ambient	Shall not exceed 50 ug/l
pH	Ambient	Class A, B: Range shall not be outside 7.0 to 8.3 standard units Class C: Range shall not be outside 6.7 to 8.5 standard units
Dissolved Oxygen	Ambient	Class A, B: Shall be no less than 5.5 mg/L Class C: Shall be no less than 5.0 mg/L
Temperature	Ambient	Shall not exceed 32 degrees Celsius at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions

3.5 Data gaps and error control:

Data gaps are not limited to existing data sets, but it can also refer to the lack of certain types of data. The Integrated Report will make mention of US Virgin Islands data gaps; additionally, disclaimer language will be added to ensure that everyone who reviews the document is clear about the data used to make assessments. The US Virgin Islands will make every effort to control errors that may have been reported in data. Data determined to be erroneous or flawed based on the program's data quality objectives established in the Coastal Water Quality Monitoring (Ambient) and Beach Water Quality Monitoring Programs Quality Assurance Project Plans will be discarded.

The table below lists potential data gaps which DPNR intends to work on developing a data document in collaboration with EPA Region 2 in the near future. Any data gaps that are identified will be included in the multi-year monitoring strategy for resolution.

Future Assessment Methodologies to be Included	Timeframe for inclusion
Toxicity and toxicant data	See Section 1.4 & Appendix A of the 2015 USVI MYMS for details
Wetland assessment data	See Section 1.4, 4.3 & Appendix A of the 2015 USVI MYMS for details
Intermittent streams data	See Appendix A of the 2015 USVI MYMS for details
"Natural" levels relative to the DO and temperature standards	See Appendix A of the 2015 USVI MYMS for details
Narrative criteria, as listed in Section 186-1(c) of the VI WQS Regulations	See Appendix A of the 2015 USVI MYMS for details
Radioactivity data	See Appendix A of the 2015 USVI MYMS for details

3.6 Natural Disasters:

Hurricane season in the US Virgin Islands lasts from June through November each year. There was no sampling during this reporting cycle related to natural disasters. However, the following storm events occurred:

FY14
No episodic monitoring conducted

FY15
Hurricane Danny:
August 21, 2015 - Conducted Beach/Coastal Assessments

Tropical Storm Erika:
August 25-26, 2015 - Conducted Beach/Coastal Assessments

3.7 QA/QC:

DPNR evaluates all internal monitoring data to determine if the Data Quality Objectives outlined in the USVI Ambient Water Quality Monitoring Program Quality Assurance Project Plan are met i.e. compliance with the Relative Percent Difference (RPD) of 30 or less. Once the data is determined to meet the required objectives, for example the RPD, the data is used to conduct the assessments for the reporting cycle. The elements evaluated are as follows:

Precision and accuracy

The precision and accuracy of data are determined by particular actions of the analytical laboratory and field staff, which are outlined in the relative SOPs and QAPPs.

Representativeness

The representativeness of the data is mainly dependent on the sampling locations and the sampling procedures adequately representing the true condition of the sample site. Sampling station siting, and use of only approved/documented analytical methods will determine that the measurement data represent the conditions at the site, to the extent possible. Sampling schedules will be designed with respect to frequency, locations and methodology in order to maximize representativeness, where possible and applicable.

Laboratory representativeness will be achieved by following analytical procedure and standard operating procedures, meeting holding times, and assessment and comparison of field duplicate samples.

Comparability

The comparability of data produced by and for DPNR is predetermined by the commitment of its staff and analytical laboratories to use standardized methods, where possible, including EPA approved analytical methods, or documented modifications thereof which provide equal or better results. These methods have specified units in which the results are to be reported.

Completeness

The completeness of data is a relationship of how much of the data is available for use compared to the total potential data before any conclusion is reached. Ideally, 100% of the data should be available. However, the possibility of data becoming unavailable due to laboratory error, insufficient sample volume, or samples broken in shipping must be expected. Also, unexpected situations may arise where field conditions do not allow for 100% data completeness. Failure to achieve 100% data completeness usually will result from the field crew's inability to sample at stations because of logistical barriers, such as insufficient depth, or adverse weather conditions. In the limited number of instances where these may be encountered, efforts will be made to relocate the station in an adjacent area or re-sample the station. In addition, established protocols for tracking samples during shipment and laboratory processing must be followed to minimize data loss following successful sample collection. The Department has various completeness goals: 100% for data collection and data usage, which directly correlates to a 100% goal for data used to make assessments. However, if less than 8-quarters of data are collected then the Department will not be able to de-list assessment units eligible for delisting.

It is the responsibility of the program manager to verify that the data are representative and completeness is achieved while the analytical data's precision, accuracy, and comparability are mainly the responsibility of the laboratory supervisor.

3.8 Listing Rules:

Minimum Number of Samples: Unless described differently for a particular parameter, the minimum data set consists of eight (8) samples. These recommendations are intended to ensure that existing water quality conditions are accurately portrayed by the data and that the results do not reflect transitional conditions. The Department will consider a data set which does not meet this minimum requirement on a case-by-case basis to determine if the data adequately characterizes the water quality conditions. Summer-only sampling for nutrients, pathogenic quality, and temperature may be acceptable since summer generally represents the critical condition for these parameters. If the Department determines that the data set adequately represents water quality conditions and there are at least two exceedances of the Surface Water Quality Standards, this limited data set will be used to determine that a use is not attained.

4.0 Designated Use Attainment:

The VI Water Quality Standards identify specific designated uses for the waters of the US Virgin Islands according to their waterbody classifications. Designated uses include:

- maintenance and propagation of desirable species of aquatic life (including threatened, endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code)
- primary contact recreation (swimming, water skiing, etc.).

The Department uses both numeric and narrative criteria to protect designated uses. Numeric criteria are estimates of constituent concentrations that are protective of the designated uses. Narrative criteria are non-numeric descriptions of conditions to be attained/maintained or avoided.

Waterbody delineations used for determining use support are derived from geographic information system (GIS) coverages. The Division of Environmental Protection is currently considering contracting professional services to develop a standard waterbody delineation based on a number of prevailing factors, with intention to implement in the 2020 Integrated Report.

Presently, use support will be determined using the most current version of the US Virgin Islands Water Quality Standards which was promulgated on June 11, 2010.

As part of the assessment process, each assessment is rated as being supporting, partially supporting, not supporting or not applicable (not applicable is usually the result of a data gap). Under the integrated reporting format, partially supporting and not supporting **are both considered impaired and will be listed under category 5 provided water quality standards are exceeded**. The USVI uses partially supporting only as a measure of impairment severity. Severity is important in helping the USVI design a schedule for total maximum daily loads. While partially supporting waters are listed as impaired, not supporting waters are listed as impaired and threatened.

In order to assess an assessment unit, data must be available for at least one applicable parameter associated with the attainment of the given designated use. Impairment of any single indicator will result in the waterbody being listed as impaired (for that parameter), even if the other indicators do not exceed the standards.

Consideration will be taken in cases where a parameter falls within the degree of error of monitoring equipment; the data will be reviewed and if the value is within the instrumentation's degree of error it will be accepted. If after the instrument's degree of error is considered the parameter is still found to be an exceedence it will be considered as such.

The coastal waters of the Virgin Islands are evaluated for the following uses: Primary Contact Recreation and Aquatic Life Use Support. All existing and readily available data and information will be assembled and used in the assessment. Currently the fresh waters of the Virgin Islands are not monitored, so no assessment is done at this time for these water classes.

4.1 Parameters for Designated Use Assessments:

Evaluation of this reporting cycle's data has determined that the following parameters be used to perform assessments:

Designated Use	Minimum Parameters Used For Assessments	Source Data Type
• Maintenance and propagation of desirable species of aquatic life • Primary Contact Recreation	Enteroccoci	Ambient
		Beach
	Fecal Coliform	Ambient
	Turbidity (Laboratory-generated)	Beach
	Total Phosphorus	Ambient
	Dissolved Oxygen	Ambient
	Turbidity (Multi-parameter Sonde)	Ambient
	pH	Ambient
	Temperature	Ambient

Use Support Determination

This methodology groups assessments as follows:

Primary Contact Recreation (PCR) Indicators	Aquatic Life Use Support (ALUS) Indicators
Microbiological Assessment* Beach Closing Assessment* Toxicant Assessment (Human Health)	Habitat Assessment Toxicity Assessment Conventional Assessment*

Other Parameters	Toxicant Assessment (Aquatic Life) Biological Assessment

*These parameters were used in making the assessments used for listing during this reporting cycle

4.2 Primary Contact Recreation:

4.2.1 Microbiological Assessment

The use support is based on a review of quarterly ambient and weekly beach data for single sample maximum allowable density of fecal coliform and enterococci bacteria, beach closing data and reported oil spills. Allowable limits are determined by the class of the water body. Class A requires that in no case shall Class B water quality standards be exceeded. For fecal coliform, Class B waterbodies should not exceed a geometric (log) mean of 70/100ml and 200 colonies/100mL in Class C waters. Likewise, for all classes of waters, a geometric mean of 35 enterococci per 100 mL, or a single sample maximum of 104 per 100 mL of enterococci should not be exceeded at any time The percent of total violations is evaluated as follows:

1. Fully Supporting: None of the Samples exceed a geometric mean of 70 or 200 colonies/100 ml in Class B and C waters for fecal coliform and 104 colonies/100 ml for enterococci.

2. Not supporting: Any of the Samples exceed a geometric mean of 70 or 200 colonies/100 ml in Class B and C waters for fecal coliform and 104 colonies/100 ml for enterococci. These AUs will be listed if the quarterly geometric means are exceeded.

4.2.2 Beach Closing Assessment:

In addition to pathogens, beach-closing data will be used to determine primary contact recreation use support. The matrix of allowable violations is as follows:

1. Supporting: No bathing area closures or restrictions in effect during reporting period.

2. Not Supporting: On average, one bathing area closure per year of greater than 1 week's duration, or more than one bathing area closure per year.

* Closure as stated above refers to the VI Department of Health or VI Waste Management Authority closing beaches due to immediate health risks or threats. While, restrictions refer to advisories which may recommend that the public avoid certain areas/beaches.

The Department of Planning and Natural Resources only issues administrative advisories, and cannot restrict beach access. Beach closures would only be enforced by government enforcement officials for very serious threats to human health; these closures can only be

implemented by the VI Department of Health or the VI Waste Management Authority. These serious threats are usually related to bypasses or overflows of the municipal sewer system, which may result in raw sewage flowing onto beaches and into the nearshore/bathing areas. DEP has implemented a Beaches Environmental Assessment and Coastal Health (BEACH) Monitoring Program that takes samples for Enterococci at select sites on a weekly basis. This data will be used in conjunction with data collected from the Ambient Monitoring Program.

Beaches which are listed as not suitable for fishing or swimming in the weekly Beach Program have had samples collected which exceed the standard within that monitoring week. Those beaches that are re-sampled according to the BEACH QAPP and exceed the standard twice within that monitoring week shall be listed as well. The raw data collected by the Beach Program at the program's 43 designated beached are used to calculate the geometric mean for each designated beach on a quarterly basis, and that data is used in assessment.

4.2.3 Other Parameters:

Throughout the course of collecting data for this report, data that does not fit within the auspices of the other assessment categories of Primary Contact Recreation Use Support (e.g. aesthetics, pH, turbidity, algae, odor, etc.) will be considered under Other Parameters. The following guidelines apply where appropriate:

1. Fully Supporting: For any one pollutant or stressor, criteria exceeded in none of the measurements.

2. Not Supporting: For any one pollutant, criteria exceeded in any of measurements.

DPNR-DEP intends to continue to work towards developing expanded criteria for making assessments within this category. There were no assessments made for this category during this reporting cycle.

4.3 Aquatic Life Use:

4.3.1 Toxicant Assessment (Aquatic Life)/ Toxicity Assessment:

The applicable numeric water quality standards for toxic pollutants to protect the designated uses of waters of the U.S. Virgin Islands shall be the Environmental Protection Agency's (EPA) national recommended Clean Water Act section 304(a) water quality criteria, EPA's Office of Water, Office of Science and Technology (4304T), 2006. Those parameters can be found at the following website: <http://www.epa.gov/waterscience/criteria/wqctable/index.html>

The conditions for use support are as follows:

1. Fully Supporting: No toxicants or toxicity noted in either acute or chronic tests compared to controls or reference conditions.

2. Partially Supporting: No toxicants or toxicity noted in acute tests, but may be present in chronic tests less than two (2) times within the minimum data set.

3. Not Supporting: Toxicants or toxicity noted in two (2) or more tests within the minimum data set.

Currently DPNR-DEP does not collect any toxicity data and none was received during the data solicitation period. Therefore, no assessments were made based on toxicants or toxicity during this reporting period. DPNR-DEP will continue to review its criteria for these assessments and will work to improve upon the current criteria to ensure they are relevant to the assessment of human health. Additionally, as DPNR-DEP works to expand the VI Water Quality Standards this section will continue to be amended.

4.3.2 Habitat Assessment:

Determination of Aquatic Life Use Support will consider habitat assessment data (based on availability) in relation to propagation of desired species of marine life and the biological integrity of the benthic communities living within waters. These communities shall be assessed by comparison to reference conditions(s) with similar abiotic and biotic environmental settings that represent the optimal or least disturbed condition for that system. Such reference conditions shall be those observed to support the greatest community diversity, and abundance of aquatic life as is expected to be or has been historically found in natural settings essentially undisturbed or minimally disturbed by human impacts, development, or discharges.

Habitat assessment data is considered as follows:

1. Fully Supporting: Reliable data indicate natural channel morphology, substrate composition, bank/riparian structure, and flow regime of region. Riparian vegetation of natural types and of relatively full standing crop biomass (i.e., minimal grazing or disruptive pressure).

2. Partially Supporting: Modification of habitat slight to moderate usually due to road crossings, limited riparian zones because of encroaching land use patterns, and some watershed erosion. Channel modification slight to moderate.

3. Not Supporting: Moderate to severe habitat alteration by channelization and dredging activities, removal of riparian vegetation, bank failure, heavy watershed erosion or alteration of flow regime and inclusion of exotic or aquatic nuisance species

DPNR-DEP received no habitat assessment data for the 2014-2015 reporting cycle. However, DPNR has established a work group to begin to discuss correlations between water quality and

various indicator species. As DPNR-DEP continues its ongoing efforts to improve the VI Water Quality Standards, criteria will be set for reference conditions/sites which will assist in completing habitat assessments for various waterbody classes. Further information on a timeline for implementation can be found in Appendix A of the 2015 USVI MYMS.

4.3.3 Conventional Assessment:

Conventional parameters are evaluated using the number of exceedences of water quality standards. A waterbody is determined to be impaired if there is an exceedance of a specific parameter two (2) or more times within the minimum data set of 8 quarters.

The conventional parameters are:

- Dissolved Oxygen (not less than 5.5 mg/l from other than natural conditions)*;
- Temperature (not to exceed 32°C at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions)*;
- Turbidity (Class A, B: shall not exceed 3NTU (in-situ reading) and secchi disk reading of minimum of 1 meter; Class C: secchi disk reading of minimum of 1 meter); and
- pH. (Class A, B: Range shall not be outside 7.0 to 8.3 standard units; Class C: Range shall not be outside 6.7 to 8.5 standard units)

*The term “natural condition” for Dissolved Oxygen and Temperature will be addressed through work in collaboration with the Environmental Protection Agency (EPA) for Class B and C waters during a future Triennial Review of the WQS. During that process DPNR-DEP will outline how they will define reference sites and establish reference conditions. Once developed these criteria will be incorporated into this Assessment Methodology.

The conditions for use support for the conventional parameters are as follows:

1. Fully Supporting: For any one pollutant or stressor, criteria exceeded in none of the measurements.

2. Not Supporting: For any one pollutant, criteria exceeded in any of the measurements.

4.3.4 Biological Assessment:

When available, DPNR-DEP may use data collected/received from biological monitoring projects. Upon identifying a source of data to apply towards a biological assessment, the conditions for use support, which will be evaluated in accordance with the narrative Biocriteria outlined in the VI Water Quality Standards, as follows:

1. Fully Supporting: Reliable data indicate functioning, sustainable biological assemblages (e.g., fish, macroinvertebrates, or algae) none of which has been modified significantly beyond the natural range of the reference condition.

2. Partially Supporting: At least one assemblage (e.g., fish, macroinvertebrates, or algae) indicates moderate modification of the biological community compared to the reference condition.

3. Not Supporting: At least one assemblage indicates nonsupport. Data clearly indicates severe modification of the biological community compared to the reference condition.

DEP received no biological data for the 2014-2015 reporting cycle.

4.4 Listing Categories:

Category 1
The assessment unit is placed in this category if it meets the water quality standards for the parameters that define support for both Primary Contact Recreation (PCR) & Aquatic Life Use Support (ALUS).

Category 2
The assessment unit is placed in this category if it attains water quality standards for the parameters that define support for either PCR or ALUS but not all uses are supported.

Category 3
The assessment unit is placed it this category if insufficient or no data is available to determine if water quality standards are attained and any designated use is supported. The Virgin Islands considers insufficient data as anything less than eight quarters of monitoring data. However, waters with less than eight quarters of monitoring data may be reviewed on a case-by-case basis if the limited data strongly suggests that water quality standards are exceeded and the designated uses are impaired. Such waters may be eligible for inclusion on the 303(d) List. Remaining waters with insufficient data will be scheduled for more extensive monitoring in the USVI's multi-year monitoring schedule.

Category 3A
No data is available from any of the identified data sources for the assessment unit in question.

Category 3B
Insufficient Data is available from any of the identified data sources for the assessment unit in question. Insufficient data is defined as less than eight quarters of monitoring data. This category differs from Category 2 in that this condition must apply to all designated uses.

Category 3C

Inconclusive Data is available from any of the identified data sources for the assessment unit in question. This might include information from studies that do not directly provide information related to water quality standards.

Category 3D
Unreliable or low quality data is available from any of the identified data sources for the assessment unit in question. Unreliable or low quality data is defined as data sets that have significant gaps, obvious anomalies, etc.

Category 4
Assessment units that are found to be partially or not supporting for one or both designated uses are place in category 4 under the appropriate subcategory (4A, 4B, 4C), but TMDL is not needed.

Category 4A
The assessment unit is placed in this category if it was previously listed on the 303(d) list and a total maximum daily load has been established and approved by EPA.

Category 4B
The assessment unit is placed into this category only if other pollution control requirements are expected to address all water-pollutant combinations and attain all water quality standards within a reasonable period of time. The Virgin Islands considers a reasonable period of time as being the time between reporting cycles. If the impairment is the result of a point source discharge, it is expected that the Territorial Pollution Discharge Elimination System (TPDES) program will take appropriate measures to control point source pollution. If the impairment is the result of non-point source pollution, DPNR will provide evidence that a pollution control measure is in place.

Category 4C
The assessment unit is placed into this category if the impairment was not caused by a pollutant, but instead is caused by pollution. Assessment Units placed in Category 4C do not require the development of a TMDL. Pollution, as defined by the CWA is “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water” (section 502(19)). In some cases, the pollution is caused by the presence of a pollutant and a TMDL is required. In other cases, pollution does not result from a pollutant and a TMDL is not required. These assessment units should be scheduled for monitoring to confirm that there continues to be no pollutant associated with the failure to meet the water quality standard and to support water quality management actions necessary to address the cause(s) of the impairment

Category 5
The assessment unit is placed into this category if water quality standards are exceeded and a total maximum daily load must be established. Assessment units that are placed into Category 5 will be placed on the 2016 303(d) List.

De-listing

Using the abovementioned data restrictions and drawing from the dataset detailed in Section 3.1.1 above, DPNR shall determine if any Assessment Units can be de-listed for the 2014-2015 reporting cycle.

4.5 Groundwater Monitoring Program:

WQM is not tasked with monitoring the groundwaters of the USVI. WQM has been informed by DPNR-DEP's Groundwater Program that the only groundwaters that are monitored throughout the Territory are those that are potable water sources. The monitoring is required through DPNR-DEP's Public Water Systems Supervision Program.

Appendix A: Summary of Criterion Levels of Virgin Islands Water Quality Standards:

Class A

Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.

Criterion	**Class B**	**Class C**
Dissolved Oxygen	Not less than 5.5 mg/l from other than natural conditions	Not less than 5.0 mg/l from other than natural conditions
pH	<8.3 Tolerable Limit >7.0 Normal range of pH must not be extended at any location by more than ±0.1 pH unit.	<8.5 Tolerable Limit>6.7 Normal range of pH must not be extended at any location by more than ±0.1 pH unit.
Temperature	Not to exceed 32° Celsius at any time, nor as a result of waste discharge to be greater than 1°C above normal.	Same as Class B
Bacteria	A geometric (log) mean of 70fecal coliforms per 100 ml by MF or MPN count Not to exceed a geometric mean of 35 enterococci per 100 ml, not to exceed a single sample maximum of 104 per 100 ml at any time.	A geometric (log) mean of 200 fecal coliforms per 100 ml by MF or MPN count Not to exceed a geometric mean of 35 enterococci per 100 ml, not to exceed a single sample maximum of 104 per 100 ml at any time
Chlorine	The 4-day average concentration of Chlorine shall not exceed 7.5 ug/l. The 1-hour average concentration of Chlorine shall not exceed 13 ug/l	Same as Class B
Phosphorus	Total P shall not exceed 50 ug/L any coastal waters	Same as Class B

Suspended, colloidal or settleable solids	None from wastewater sources which will cause disposition or be deleterious for the designated uses shall be present in any waters.	Same as Class B
Oil and Floating substances	No residue attributable to waste water. No visible film; no globules of grease shall be present in any waters.	Same as Class B
Radioactivity	**Gross Beta:** 1000 picocuries per liter, in the absence of Sr 90 and alpha emitters **Radium-226:** 3 picocuries per liter **Strontium-90:** 10 picocuries per liter	Same as Class B
Taste and Odor	None in amounts to interfere with use for primary contact recreation, potable water supply or to render undesirable taste or odor to edible aquatic life	Same as Class B
Color and Turbidity	• A secchi disc shall be visible at a minimum depth of one meter • A maximum nephelometric turbidity unit reading of three (3) shall be permissible	• A secchi disc shall be visible at a minimum depth of one meter
Toxicity	The applicable numeric water quality standards for toxic pollutants to protect the designated uses of waters of the U.S. Virgin Islands shall be the Environmental Protection Agency's (EPA) national recommended Clean Water Act section 304(a) water quality criteria, EPA's Office of Water, Office of Science and Technology (4304T), 2006, which is incorporated by reference for: the protection of saltwater aquatic life from acute (criterion maximum concentration) and chronic (criterion continuous concentration) effects; and, the protection of human health from the consumption of organisms. The applicable criteria may be	

	found at: http://www.epa.gov/waterscience/criteria/wqctable/index.html
Biocriteria	The Territory shall preserve, protect, and restore water resources to their most natural condition. The condition of these waterbodies shall be determined from measures of physical, chemical, and biological characteristics of each waterbody class, according to its designated use. As a component of these measures, the Territory may consider the biological integrity of the benthic communities living within waters. These communities shall be assessed by comparison to reference conditions(s) with similar abiotic and biotic environmental settings that represent the optimal or least disturbed condition for that system. Such reference conditions shall be those observed to support the greatest community diversity, and abundance of aquatic life as is expected to be or has been historically found in natural settings essentially undisturbed or minimally disturbed by human impacts, development, or discharges. This condition shall be determined by consistent sampling and reliable measures of selected indicator communities of flora and/or fauna and may be used in conjunction with other measures of water quality. Waters shall be of a sufficient quality to support a resident biological community as defined by metrics based upon reference conditions. These narrative biological criteria shall apply to fresh water, wetlands, estuarine, mangrove, seagrass, coral reef and other marine ecosystems based upon their respective reference conditions and metrics.
General water quality criteria	These waters shall be free of substances attributable to municipal, industrial, or other discharges or wastes as follows: (1) Materials that will settle to form objectionable deposits. (2) Floating debris, oils, scum, and other matter. (3) Substances producing objectionable color, odor, taste, or turbidity. (4) Materials, including radionuclides, in concentrations or combinations which are toxic or which produce undesirable physiological responses in human, fish and other animal life, and plants. (5) Substances and conditions or combinations thereof in concentrations which produce undesirable aquatic life. (6) Exotic or aquatic nuisance species.

	All waters of the U.S. Virgin Islands shall meet generally accepted aesthetic qualifications and shall be capable of supporting diversified aquatic life. "Waters" of the U.S. Virgin Islands shall be defined, as follows, as in by Title 12, Chapter 7, Section I82(f) of the Virgin Islands Code; "Waters of the United States Virgin Islands" means all waters within the jurisdiction of the United States Virgin Islands including all harbors, streams, lakes, ponds, impounding reservoirs, marshes, water-courses, water-ways, wells, springs, irrigation systems, drainage systems and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, situated wholly or partly within or bordering upon the United States Virgin Islands, including the territorial seas, contiguous zones, and oceans."

** Information listed in the table above is from the USVI Water Quality Standards promulgated on June 11, 2010

ATTACHMENT A – List of agencies contacted during Data Solicitation Public Notice

The following agencies were contacted to request data during the Data Solicitation Period. The agencies were asked to submit all relative monitoring data for the monitoring period with the associated Quality Assurance Project Plan:

Contact Name	Title	Agency	Data Received
Kofi Boateng	Associate State Director	UVI-CES	No data submitted
Darvene Adams	-	USEPA Region 2	No data submitted
David Worthington	-	National Park Service	No data submitted
Barbara S.P. Moore	Director	NOAA/National Undersea Research Program	No data submitted
Eric Hawk	Section 7 Coordinator	National Marine Fisheries Service	No data submitted
Pedro Diaz	-	USGS/GSA Center	No data submitted
Edwin Muniz	Supervisor	USFW/PR Field Office	No data submitted
Tyler Smith, Ph.D.	Assoc. Professor	UVI-CMES	No data submitted outside of Supp106 Project
Paul Jobsis, Ph.D.	Acting Director	UVI-CMES	No data submitted
Nancy Graff & Lisa Terry	-	TNC	No data submitted
Bernard Castillo, Ph.D.	Associate Professor	UVI-CMAS	No data submitted
Kevin Brown	Lab Manager	UVI-CMES	No data submitted outside of Supp106 Project. Project produced nutrient and sedimentation data.
Stevie Webster	-	USVI DOH-EH	No data submitted
Rudy O'Reilly	-	USDA/NRCS	No data submitted
Marlon Hibbert	USVI Management Liason	NOAA's Coral Reef Conservation Program, OCRM	No data submitted