The 2010 USVI Integrated Water Quality Monitoring & Assessment Report intends to satisfy the USVI requirements of the Federal Clean Water Act Sections 305(b) and 303(d).

Submitted by:

Department of Planning & Natural Resources
Division of Environmental Protection

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Web: www.dpnr.gov.vi/dep/home.htm
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I. EXECUTIVE SUMMARY

A. Purpose

The 2010 US Virgin Islands Integrated Water Quality Monitoring and Assessment Report was prepared by the Department of Planning and Natural Resources, Division of Environmental Protection (DPNR/DEP) and is intended to satisfy abbreviated reporting requirements under section 305(b) of the Federal Clean Water Act (CWA). This report also is intended to satisfy the requirements of section 303(d) of the Federal CWA by developing a list of assessment units that will require Total Maximum Daily Loads (TMDLs). This report provides an assessment of the water quality conditions of the Virgin Island’s surface and ground water resources for the period covering fiscal years 2008 and 2009 (October 1, 2007 through September 30, 2009).

B. Overview of Water Quality Conditions and Trends

Water quality in the US Virgin Islands is generally good but declining due to an increase in point and non-point source discharges into the marine environment. Sources such as direct discharges, stormwater run-off and vessel wastes increase stresses on US Virgin Islands (VI) waters.

1. Surface Water

Non-point source pollution is the major source of surface water contamination in the Virgin Islands. Non-point source pollution can be attributed to several causes such as:

- Failure to properly install effective silt control devices during construction,
- Failure to contain storm water run-off from unpaved roads,
- Failure of on-site disposal systems (OSDS).

The discharging of wastes overboard directly into the sea by boat owners and the difficulty in regulating such activity also contributes to non-point source pollution problems seen in the US Virgin Islands. Point Source Pollution can be attributed to an antiquated municipal sewage system. Poor preventive maintenance practices due to lack of funding and other resources within the Waste Management Authority result in “bypasses” that result in the release of untreated sewage directly into the waters of the US Virgin Islands. The Government of the US Virgin Islands has made considerable progress towards resolving these issues by the upgrading of new treatment plants and upgrading other portions of the municipal system.

2. Ground Water

The primary sources of groundwater contamination in the US Virgin Islands are:
• Bacteriological contamination from failing septic systems
• Leaking municipal sewer lines
• Migration of contamination from previous injections and disposal practices
• Frequent sewage bypasses (generally described as discharges direct to the sea, but with some percolation into sub-soils)

Other sources of ground water contamination include intrusion of salt water caused by the over-pumping of the aquifers, invasion of volatile organic compounds (VOC’s), contamination from leaking underground storage tanks, and the indiscriminate/illegal discharges of waste.

C. Program Initiatives

Under the provisions of the Federal and Local Water Pollution Control Act, the US Virgin Islands Water Pollution Control (WPC) Program is mandated to conserve, protect, preserve, and improve the quality of water for public use, and the propagation of wildlife, fish and aquatic life for the USVI. To ensure the preservation of water quality WPC projects monitor compliance with the Water Quality Standards as set forth in the US Virgin Islands Environmental Laws and Regulations.

In addition, the program-reporting period (FY2008 and FY2009) saw water quality management activities in the US Virgin Islands being planned for integration for management and reporting purposes with the Unified Watershed Assessment process of the Clean Water Action Plan. This US Virgin Islands Water Quality Assessment presents water quality assessment information in a format that preserves the US Virgin Islands long-term data series by using the same water quality monitoring sites. This report also indicates how these data can be summarized at a level that is compatible for both Water Quality Assessment and Unified Watershed Assessment processes.

The Government of the Virgin Islands is presently enhancing and strengthening its territorial Water Pollution Control Act and revised its Water Quality Standards in July 2010. This ongoing process builds upon previous 305(b) and 303(d) reporting periods. The Department initiated the process of revising the Water Quality Standards in time for the Clean Water Act tri-annual update which was due in FY 2007; however a lack of resources, mainly staff, delayed this revision. The Territory developed and promulgated Stormwater Regulations in June 2007, developed to particularly reduce sedimentation from construction sites. The Department also began issuing General Permit Coverages for Construction Activities on December 1, 2007. Furthermore, DPNR-DEP advocates the use of best management practices (BMPs) in the Revised Handbook for Homebuilders and Developers (Wright, 2002). DPNR has developed Total Maximum Daily Loads (TMDLs) for various assessment units; although none were completed in FY2008 or 2009, numerous assessment units were identified in the 2010 303(d) impaired assessment units listing. DPNR continues to apply for additional funding through the 604(b) Water Quality Management Planning (WQMP), formerly known as the 205(j) program, to achieve some of these Management tasks.

D. Summary of Classified Uses

USVI waters are classified into three (3) groups based on designated uses: Class A, B, and C:
Class A waters are for the preservation of natural phenomena requiring special conditions with existing natural conditions that shall not be changed. Class A water standards are the most stringent of the three (3) classes because of its pristine or near-pristine state.

Class B and C waters are for the propagation of desirable species of marine life and for primary contact recreation.

Class C waters have less stringent water quality standards than Class B.

Detailed specifications for these classes are presented in Part II, Section B, below.

All waters of the Virgin Islands are designated for fish consumption, aquatic life support, primary contact recreation, and secondary contact uses pursuant to the Virgin Islands Water Quality Standard, Title 12, Chapter 7, §186-1 of the Virgin Islands Rules and Regulations (VIRR).

E. Highlights of the Rest of this Report

- Part II maps and explains the geographic delineation used by the Department of Planning and Natural Resources to report on this Water Quality Assessment, and to display the effects on watersheds and watershed restoration priorities in the Virgins Islands.
- Part III reports on surface water quality issues in the Virgin Islands.
- Part IV reports groundwater and related non-point source issues in the Virgin Islands.

II. BACKGROUND

A. Resource Overview

The territory of the United States Virgin Islands comprises three major islands: St. Croix, St. John and St. Thomas. Additionally, 57 smaller islands and cays were documented in *A Natural History Atlas to the Cays of the US Virgin Islands* (Thomas and Devine, 2005). Taken together, the territory encompasses a total land area of about 136 square miles or 110,000 acres (Table II.A.1) characterized by central mountain ranges and relatively small coastal plains. Peak elevations are 1,165 feet on St. Croix (Mount Eagle), 1,550 feet on St. Thomas, (Crown Mountain) and 1,297 feet on St. John (Bordeaux Mountain). The islands are generally only 2 to 6 miles wide, with no land location far from the coastal waters. All data in this report focus on the main islands of St. Croix, St. John, and St. Thomas although several enclosed bays within the main islands' watersheds include offshore islands and cays.

The return of Water Island to the control of the Government of the US Virgin Islands, after 50-some years of direct federal administration (first as a fort by the Department of the Army during the Second World War, and later as the responsibility of the US Department of the Interior) raises the question of whether this areas should be treated as a fourth island. For the purposes of the Water Quality Assessment, Water Island will be treated as another offshore cay or small inhabited island, such as Hassel Island or Great St. James because the area is small (less than 600 acres or 1 square mile), and because the island is practically within St. Thomas Harbor.
The offshore cays and small islands are an inherent piece of the natural heritage of the Virgin Islands. Additionally, as an economic asset, these offshore sites could be included within a broad eco-tourism program for the territory. Many government-owned cays have already been established as wildlife reserves pursuant to Title 12 94(b)(2) VI Rules and Regulations. A number are important seabird nesting sites, and several are important roosting areas. The surrounding waters of most of the cays and islands teem with marine life, providing food for seabirds and for the fish and shellfish sought by commercial and recreational fishermen. They are also popular dive sites, which are important to the local diving industry.

There are no large freshwater lakes or ponds, and no perennial streams on any of the islands; intermittent streams can only be seen after heavy rainfall or during the rainy season (May – November). The absence of large freshwater resources and perennial streams means that guts (watercourses) form the basis for watershed management in the territory.

This Water Quality Assessment is based on the United States Geological Survey (USGS) 8-digit Hydrologic Units for the US Virgin Islands, which designate two Virgin Islands watersheds: one for St. Croix, and one for the combined islands of St. Thomas and St. John.

In addition, this Water Quality Assessment also uses 11- and 14-digit Hydrologic Unit definitions, in the process of being finalized by the US Geological Service of the US Department of Interior and the Natural Resources Conservation Service of the US Department of Agriculture, to define territorial Watersheds. Within these fourteen draft watersheds (seven on St. Croix, four on St. Thomas, and three on St. John), the Virgin Islands have defined waterbody Assessment Units, which correspond to coastal elements of watersheds.

**Table II.A.1 Characteristics of Virgin Islands Watersheds and Islands**

<table>
<thead>
<tr>
<th></th>
<th>St. Croix</th>
<th>St. Thomas</th>
<th>St. John</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>51,389</td>
<td>54,259</td>
<td>4,014</td>
<td>109,661</td>
</tr>
<tr>
<td><strong>Land Area (square miles)</strong></td>
<td>84</td>
<td>32</td>
<td>20</td>
<td>136</td>
</tr>
<tr>
<td><strong>Land Area (acres)</strong></td>
<td>53,499</td>
<td>17,489</td>
<td>12,323</td>
<td>83,311</td>
</tr>
<tr>
<td><strong>Tidal/sub-tidal wetlands (square miles)</strong></td>
<td>2.5</td>
<td>2.4</td>
<td>1.1</td>
<td>5.9</td>
</tr>
<tr>
<td><strong>Coastal Shoreline</strong></td>
<td>70.3</td>
<td>52.8</td>
<td>49.7</td>
<td>172.8</td>
</tr>
<tr>
<td><strong>Embayments (square miles)</strong></td>
<td>1.5</td>
<td>0.9</td>
<td>0.1</td>
<td>3.5</td>
</tr>
</tbody>
</table>
Figure II.A.1 St. Croix subwatersheds and assessment unit overview

The 14-digit Hydrologic Unit delineations are to be integrated with the list of watersheds used for the analysis in the Unified Watershed Assessment: See Part III below.

Figure II.A.2 St. Thomas/St. John subwatersheds and assessment unit overview
### Table II A.2 Sub-watersheds Listed in the Unified Watershed Assessment

#### St. Croix

<table>
<thead>
<tr>
<th>Watershed Name</th>
<th>Acres</th>
<th>UWA Category</th>
<th>Watershed Name</th>
<th>Acres</th>
<th>UWA Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Northside</td>
<td>2,258</td>
<td></td>
<td>N. Bugby Hole</td>
<td>998</td>
<td>2</td>
</tr>
<tr>
<td>B. Baron Bluff</td>
<td>1,262</td>
<td>4</td>
<td>O. Cane Garden Bay</td>
<td>1,527</td>
<td>2</td>
</tr>
<tr>
<td>C. Salt River Bay</td>
<td>3,510</td>
<td>2</td>
<td>P. HOVENSA</td>
<td>7,642</td>
<td>1</td>
</tr>
<tr>
<td>D. Princess</td>
<td>2,182</td>
<td></td>
<td>Q. Bethlehem</td>
<td>6,689</td>
<td>1</td>
</tr>
<tr>
<td>E. Christiansted</td>
<td>1,225</td>
<td>1</td>
<td>R. Airport</td>
<td>1,654</td>
<td>1</td>
</tr>
<tr>
<td>F. Altoona Lagoon</td>
<td>1,239</td>
<td></td>
<td>S. Diamond</td>
<td>2,577</td>
<td>1</td>
</tr>
<tr>
<td>G. Southgate</td>
<td>1,597</td>
<td>1</td>
<td>T. Long Point Bay</td>
<td>2,044</td>
<td>2</td>
</tr>
<tr>
<td>H. Solitude</td>
<td>1,691</td>
<td>4</td>
<td>U. Sandy Point</td>
<td>2,735</td>
<td>4</td>
</tr>
<tr>
<td>I. Teagues Bay</td>
<td>1,061</td>
<td>4</td>
<td>V. La Grange</td>
<td>3,137</td>
<td>2</td>
</tr>
<tr>
<td>J. Turner Hole</td>
<td>711</td>
<td></td>
<td>W. Prosperity</td>
<td>967</td>
<td>4</td>
</tr>
<tr>
<td>K. Madam Carty</td>
<td>1,128</td>
<td></td>
<td>X. Creque Dam</td>
<td>703</td>
<td></td>
</tr>
<tr>
<td>L. Great Pond Bay</td>
<td>2,007</td>
<td>1</td>
<td>Y. Butler Bay</td>
<td>918</td>
<td></td>
</tr>
<tr>
<td>M. Laprey Valley</td>
<td>1,853</td>
<td></td>
<td>Z. Rams Bay</td>
<td>757</td>
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</table>

**Total St. Croix Acres ..... 54,072**

#### St. Thomas

<table>
<thead>
<tr>
<th>Watershed Name</th>
<th>Acres</th>
<th>UWA Category</th>
<th>Watershed Name</th>
<th>Acres</th>
<th>UWA Category</th>
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</thead>
<tbody>
<tr>
<td>A. Botany Point</td>
<td>945</td>
<td>4</td>
<td>H. Benner Bay</td>
<td>3,666</td>
<td>1</td>
</tr>
<tr>
<td>B. Santa Maria Bay</td>
<td>867</td>
<td>4</td>
<td>I. Frenchman Bay</td>
<td>1,137</td>
<td></td>
</tr>
<tr>
<td>C. Dorothea Bay</td>
<td>1,861</td>
<td>4</td>
<td>J. St. Thomas Harbour</td>
<td>2,696</td>
<td>1</td>
</tr>
<tr>
<td>D. Magens Bay</td>
<td>1,210</td>
<td>1</td>
<td>K. Cyril E. King Airport</td>
<td>1,524</td>
<td>4</td>
</tr>
<tr>
<td>E. Mandahl Bay</td>
<td>1,883</td>
<td></td>
<td>L. Preseverance Bay</td>
<td>704</td>
<td></td>
</tr>
<tr>
<td>F. Smith Bay</td>
<td>902</td>
<td></td>
<td>M. Fortuna Bay</td>
<td>707</td>
<td></td>
</tr>
</tbody>
</table>
G. Redhook Bay 850 1

**Total St. Thomas ........ 18,952**

### St. John

<table>
<thead>
<tr>
<th>Watershed Name</th>
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<th>UWA Category</th>
<th>Watershed Name</th>
<th>Acres</th>
<th>UWA Category</th>
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<tbody>
<tr>
<td>N. Hawksnest</td>
<td>1,305</td>
<td></td>
<td>S. Great Lameshur Bay</td>
<td>1,545</td>
<td>3</td>
</tr>
<tr>
<td>O. Maho Bay</td>
<td>1,116</td>
<td>3</td>
<td>T. Genti (Reef) Bay</td>
<td>1,208</td>
<td>3</td>
</tr>
<tr>
<td>P. Leinster Bay</td>
<td>795</td>
<td></td>
<td>U. Fish Bay</td>
<td>1,503</td>
<td>1</td>
</tr>
<tr>
<td>Q. Minnebeck Bay</td>
<td>629</td>
<td>3</td>
<td>V. Rendezvous Bay</td>
<td>416</td>
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<tr>
<td>R. Coral Bay</td>
<td>3,003</td>
<td></td>
<td>W. Great Cruz Bay</td>
<td>529</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X. Mary Point</td>
<td>110</td>
<td></td>
</tr>
</tbody>
</table>

**St. John Total Acres ...... 12,159**

These watersheds align closely with the larger 14-digit Hydrologic Units drafted by the USGS and the NRCS.

The alignment is as follows:

**Table II.A.3 Alignment of 14-Digit HUs and Watersheds**

<table>
<thead>
<tr>
<th>8-Digit</th>
<th>11-Digit</th>
<th>14-Digit</th>
<th>Name</th>
<th>Acres</th>
</tr>
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<tbody>
<tr>
<td>21020002</td>
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<td></td>
<td>St. Croix Watershed</td>
<td>54,072</td>
</tr>
<tr>
<td>21020002010</td>
<td></td>
<td></td>
<td>North St. Croix</td>
<td>22,507</td>
</tr>
<tr>
<td>21020002010010</td>
<td></td>
<td></td>
<td>Northwest St. Croix</td>
<td>6,482</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V. La Grange</td>
<td>3,137</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>W. Prosperity</td>
<td>967</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>X. Creque Dam</td>
<td>703</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Y. Butler Bay</td>
<td>918</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Z. Rams Bay</td>
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Finally, these two systems are displayed with an indication of the monitoring stations associated with each assessment unit and the number of water quality monitoring sites (Battelle 2003) established by the US Virgin Islands Department of Planning and Natural Resources.

**Table II.A.4 Assessment Units, Square Miles and Monitoring Sites**
<table>
<thead>
<tr>
<th>Assessment Unit ID</th>
<th>Assessment Unit Name</th>
<th>Class</th>
<th>AU Size (m²)</th>
<th>Associated Monitoring Stations</th>
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<td>Botany Bay</td>
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<td>VI-STT-19</td>
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<tr>
<td>VI-STJ-13</td>
<td>Coral Harbor</td>
<td>B</td>
<td>0.6965</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STJ-14</td>
<td>Hurricane Hole</td>
<td>B</td>
<td>0.7689</td>
<td>NPS-13 Water Creek, NPS-14 Princess Bay</td>
</tr>
<tr>
<td>VI-STJ-15</td>
<td>Round Bay</td>
<td>B</td>
<td>0.6015</td>
<td>STJ-53 Coral Bay, NPS-15 Coral Bay Dock, NPS-16 Johnson Bay, VI823989 Johnson’s Bay</td>
</tr>
<tr>
<td>VI-STJ-16</td>
<td>Coral Bay</td>
<td>B</td>
<td>2.2337</td>
<td>NPS-12 Long Point</td>
</tr>
<tr>
<td>VI-STJ-17</td>
<td>Salt Pond Bay</td>
<td>B</td>
<td>0.1978</td>
<td>STJ-52 Salt Pond Bay, NPS-17 Salt</td>
</tr>
<tr>
<td>Code</td>
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<td>Type</td>
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<td>VI-STJ-18</td>
<td>Grootman Bay</td>
<td>B</td>
<td>0.1046</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<td>VI-STJ-19</td>
<td>Great Lameshur Bay</td>
<td>B</td>
<td>0.359</td>
<td>STJ-51 Great Lameshur Bay, STJ-50 Little Lameshur Bay, NPS-18 Great Lameshur Bay, NPS-19 Yowzi Point, NPS-20 Little Lameshur Bay</td>
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<td>VI-STJ-20</td>
<td>Southeast St. John HUC14, offshore</td>
<td>B</td>
<td>24.319</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STJ-21</td>
<td>Genti Bay, nearshore</td>
<td>B</td>
<td>0.0947</td>
<td>STJ-49 Genti Bay, NPS-21 Reef Bay</td>
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<td>VI-STJ-22</td>
<td>Genti Bay, offshore</td>
<td>B</td>
<td>0.769</td>
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<td>VI-STJ-23</td>
<td>Fish Bay</td>
<td>B</td>
<td>0.2103</td>
<td>STJ-48 Fish Bay, NPS-22 Fish Bay</td>
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<tr>
<td>VI-STJ-24</td>
<td>Fish Bay subwatershed, offshore</td>
<td>B</td>
<td>0.1824</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STJ-25</td>
<td>Rendezvous Bay</td>
<td>B</td>
<td>0.4677</td>
<td>STJ-47 Rendezvous Bay, NPS-23 Rendezvous Bay, VI204627 Klain Bay, VI402599 Hart Bay</td>
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<tr>
<td>VI-STJ-26</td>
<td>Chocolate Hole</td>
<td>B</td>
<td>0.1004</td>
<td>STJ-46 Chocolate Hole, NPS-24 Chocolate Hole,VI391298 Chocolate Hole</td>
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<tr>
<td>VI-STJ-27</td>
<td>Rendezvous Bay subwatershed, offshore</td>
<td>B</td>
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<tr>
<td>VI-STJ-28</td>
<td>Great Cruz Bay</td>
<td>B</td>
<td>0.1396</td>
<td>STJ-45 Great Cruz Bay. NPS-25 Great Cruz Bay, VI779192 Great Cruz Bay</td>
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<td>VI-STJ-29</td>
<td>Turner Bay/Enighed Pond</td>
<td>B</td>
<td>0.057</td>
<td>STJ-55 Turner Bay, NPS-26 Turner Bay</td>
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<tr>
<td>VI-STJ-30</td>
<td>Cruz Bay</td>
<td>B</td>
<td>0.0674</td>
<td>STJ-43A Cruz Bay, North, STJ-43B Cruz Bay, South, STJ-43C Cruz Bay, North of Seaplane Ramp, STJ-43D Cruz Bay Creek North, NPS-27 Cruz Bay (ferry dock), NPS-28 Cruz Bay (airplane ramp), NPS-29 Cruz Bay (NPS dock), VI309453 Cruz Bay</td>
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<tr>
<td>VI-STJ-31</td>
<td>Great Cruz Bay watershed, offshore</td>
<td>B</td>
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<td>VI456779 Frank Bay</td>
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<td>Location Name</td>
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<tr>
<td>VI-STJ-32</td>
<td>Southwest St. John HUC14, offshore</td>
<td>B</td>
<td>10.142</td>
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<tr>
<td>VI-STJ-33</td>
<td>Pillsbury Sound</td>
<td>B</td>
<td>6.9399</td>
<td>STJ-OFF13 STJ West-4</td>
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<tr>
<td>VI-STC-01</td>
<td>Frederiksted, south</td>
<td>B</td>
<td>0.0451</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-02</td>
<td>Frederiksted Harbor</td>
<td>C</td>
<td>0.035</td>
<td>STC-28 Frederiksted Pier, STC-29 Frederiksted Public Beach, VI970611 F’sted (Fst. Target)</td>
</tr>
<tr>
<td>VI-STC-03</td>
<td>Lagrange subwatershed, offshore</td>
<td>B</td>
<td>0.375</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-04</td>
<td>Prosperity, nearshore</td>
<td>B</td>
<td>0.1118</td>
<td>VI252619 Rainbow (Prosperity)</td>
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<td>VI-STC-05</td>
<td>Prosperity subwatershed, offshore</td>
<td>B</td>
<td>0.5129</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-06</td>
<td>Sprat Hall Beach</td>
<td>B</td>
<td>0.0609</td>
<td>STC-30 Sprat Hall Beach, VI645288 Sprat Hall</td>
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<tr>
<td>VI-STC-07</td>
<td>Creque Dam/Butler Bay</td>
<td>B</td>
<td>0.529</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-08</td>
<td>Hams Bay</td>
<td>B</td>
<td>0.3144</td>
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</tr>
<tr>
<td>VI-STC-09</td>
<td>Davis Bay</td>
<td>B</td>
<td>0.0522</td>
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<tr>
<td>VI-STC-10</td>
<td>Hams Bluff</td>
<td>B</td>
<td>0.5506</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-11</td>
<td>Northwest St. Croix HUC14, offshore</td>
<td>B</td>
<td>33.302</td>
<td>STJ-OFF3 STJ NW-1, STJ-OFF10 STJ John-3</td>
</tr>
<tr>
<td>VI-STC-12</td>
<td>Cane Bay</td>
<td>B</td>
<td>0.0613</td>
<td>STC-32 Cane Bay, VI201013 Cane Bay</td>
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<tr>
<td>VI-STC-13</td>
<td>Baron Bluff subwatershed</td>
<td>B</td>
<td>0.3498</td>
<td>STC-31 Davis Bay, VI398766 Davis Bay</td>
</tr>
<tr>
<td>VI-STC-14</td>
<td>Belvedere</td>
<td>B</td>
<td>0.0557</td>
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<tr>
<td>VI-STC-15</td>
<td>Northside subwatershed</td>
<td>B</td>
<td>0.6109</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-16</td>
<td>Salt River Lagoon, Marina</td>
<td>B</td>
<td>0.0194</td>
<td>STC-33 Salt River Marina, STC-33C Salt River Lagoon, Marina</td>
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<tr>
<td>VI-STC-17</td>
<td>Salt River Lagoon, Sugar Bay</td>
<td>B</td>
<td>0.3244</td>
<td>STC-33D Salt River Lagoon, Sugar Bay</td>
</tr>
<tr>
<td>VI-STC-18</td>
<td>Salt River Bay</td>
<td>B</td>
<td>0.3229</td>
<td>STC-33A,B,E-J Salt River (Columbus Landing Beach), VI146901 Gentle</td>
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<tr>
<td>STC-19</td>
<td>Judith Fancy</td>
<td>B</td>
<td>0.01</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>STC-20</td>
<td>Salt River Bay subwatershed, west</td>
<td>B</td>
<td>0.2433</td>
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</tr>
<tr>
<td>STC-21</td>
<td>Salt River Bay subwatershed, east</td>
<td>B</td>
<td>0.8922</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>STC-22</td>
<td>Northcentral St. Croix HUC14, offshore</td>
<td>B</td>
<td>23.61</td>
<td>STC-OFF4 North-2, STC-OFF11 North-4</td>
</tr>
<tr>
<td>STC-23</td>
<td>St. Croix-By-the-Sea</td>
<td>B</td>
<td>0.0727</td>
<td>STC-34 St. Croix-By-the-Sea, VI738082 Pelican Cove</td>
</tr>
<tr>
<td>STC-24</td>
<td>Long Reef Backreef, west</td>
<td>C</td>
<td>0.1153</td>
<td>STC-48 Long Reef Backreef, west</td>
</tr>
<tr>
<td>STC-25</td>
<td>Princess subwatershed, offshore</td>
<td>B</td>
<td>0.4343</td>
<td>STC-35 Long Reef Forereef West</td>
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<tr>
<td>STC-27</td>
<td>Long Reef Forereef, east</td>
<td>B</td>
<td>0.3149</td>
<td>STC-36 Long Reef Forereef East, STC-35A LBJ (Pump Station) Outfall</td>
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<tr>
<td>STC-28</td>
<td>Altona Lagoon</td>
<td>B</td>
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<tr>
<td>STC-29</td>
<td>Christiansted Harbor, east</td>
<td>C</td>
<td>0.1089</td>
<td>STC-1 Lagoon Recreational Beach, STC-39 Altona Lagoon Inlet, VI213332 New Fort Louise Augusta</td>
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<tr>
<td>STC-30</td>
<td>Beauregard Bay</td>
<td>B</td>
<td>0.2145</td>
<td>STC-2 Ft. Louise Augusta Beach, STC-38 Christiansted Harbour Entrance-East, VI651587 Buccaneer</td>
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<tr>
<td>STC-31</td>
<td>Buccaneer Beach</td>
<td>B</td>
<td>0.0166</td>
<td>STC-3 Buccaneer Hotel</td>
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<tr>
<td>STC-32</td>
<td>Altona Lagoon subwatershed, offshore</td>
<td>B</td>
<td>0.6812</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>STC-33</td>
<td>Punnett Bay</td>
<td>B</td>
<td>0.0576</td>
<td>VI610321 Shoy’s</td>
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<td>VI-STC-34</td>
<td>Punnett Point, east</td>
<td>0.0223</td>
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<tr>
<td>VI-STC-35</td>
<td>Tamarind Reef Lagoon (Southgate Lagoon)</td>
<td>0.0205</td>
<td>STC-4 Tamarind Reef Lagoon</td>
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<tr>
<td>VI-STC-36</td>
<td>Green Cay Beach</td>
<td>0.1017</td>
<td>VI563397 Chenay Bay Beach</td>
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<td>VI-STC-37</td>
<td>Southgate subwatershed, offshore</td>
<td>2.2219</td>
<td>STC-5 Green Cay Beach</td>
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<tr>
<td>VI-STC-38</td>
<td>Solitude Backreef</td>
<td>0.9681</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-39</td>
<td>Teague Bay</td>
<td>0.1773</td>
<td>STC-8 Reef Club Beach, STC-9 St. Croix Yacht Club Beach, VI381319 Teague Bay (Reef)</td>
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<td>VI-STC-40</td>
<td>Teague Bay Backreef</td>
<td>0.8547</td>
<td>STC-10 Cramers Park, VI351774 Cramer’s Park</td>
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<tr>
<td>VI-STC-41</td>
<td>Buck Island Backreef</td>
<td>0.7675</td>
<td>STC-6 Buck Island Backreef, STC-7 Buck Island Anchorage</td>
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<tr>
<td>VI-STC-42</td>
<td>Buck Island Forereef</td>
<td>3.3497</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-43</td>
<td>Solitude and Teague Bay subwatersheds, offshore</td>
<td>18.822</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-44</td>
<td>Northeast St. Croix HUC14, offshore</td>
<td>36.088</td>
<td>STC-OFF8 North-3</td>
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<td>VI-STC-45</td>
<td>Isaac Bay</td>
<td>0.0853</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-46</td>
<td>Grapetree Bay</td>
<td>0.0425</td>
<td>STC-11B Isaacs Bay Forereef</td>
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<tr>
<td>VI-STC-47</td>
<td>Turner Hole Backreef</td>
<td>0.2772</td>
<td>STC-12 Grapetree Beach, VI297470 Grapetree Beach</td>
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<tr>
<td>VI-STC-49</td>
<td>Madam Carty Backreef</td>
<td>0.464</td>
<td>STC-13B Robin Bay</td>
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<td>VI-STC-50</td>
<td>Madam Carty, offshore</td>
<td>3.5161</td>
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<td>VI-STC-51</td>
<td>Great Pond</td>
<td>0.1578</td>
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<tr>
<td>VI-STC-52</td>
<td>Great Pond Bay</td>
<td>1.0184</td>
<td>STC-13A Great Pond Bay</td>
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<tr>
<td>VI-STC-53</td>
<td>Great Pond Bay subwatershed, offshore</td>
<td>3.0288</td>
<td>STC-OFF13 SE-4</td>
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<tr>
<td>VI-STC-54</td>
<td>Leprey Valley, Backreef</td>
<td>B</td>
<td>0.3712, There are currently no monitoring stations within this unit.</td>
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<tr>
<td>VI-STC-55</td>
<td>Leprey Valley, subwatershed, offshore</td>
<td>B</td>
<td>2.8455, There are currently no monitoring stations within this unit.</td>
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<tr>
<td>VI-STC-56</td>
<td>Bugby Hole, Backreef</td>
<td>B</td>
<td>0.7042, STC-14A Halfpenny Bay - Manchenil, STC-14B Halfpenny Backreef, VI931289, Halfpenny</td>
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<tr>
<td>VI-STC-57</td>
<td>Bugby Hole, subwatershed, offshore</td>
<td>B</td>
<td>3.9, There are currently no monitoring stations within this unit.</td>
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<tr>
<td>VI-STC-58</td>
<td>Southeast St. Croix HUC14, offshore</td>
<td>B</td>
<td>24.146, STC-OFF2 SE-1, STC-OFF10 SE-3</td>
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<tr>
<td>VI-STC-59</td>
<td>Canegarden Bay</td>
<td>B</td>
<td>0.8542, STC-15 Canegarden Bay</td>
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<tr>
<td>VI-STC-60</td>
<td>Canegarden Bay, offshore</td>
<td>B</td>
<td>0.7933, There are currently no monitoring stations within this unit.</td>
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<tr>
<td>VI-STC-61</td>
<td>Hess Oil Virgin Islands Harbor</td>
<td>C</td>
<td>0.671, STC-16 HOVENSA East Turning Basin, NW Corner, STC-17 HOVENSA West Turning Basin, NW Corner</td>
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<tr>
<td>VI-STC-62</td>
<td>Limetree Bay</td>
<td>B</td>
<td>0.7239, STC-18 Limetree Bay Container Port</td>
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<tr>
<td>VI-STC-63</td>
<td>Martin-Marietta Alumina Harbor</td>
<td>C</td>
<td>0.3228, STC-19 Krause Lagoon Channel, STC-20 Alumina Plant Dock</td>
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<tr>
<td>VI-STC-64</td>
<td>Manning Bay/Estate Anguilla Beach</td>
<td>B</td>
<td>0.0508, STC-23 Public Dump</td>
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<tr>
<td>VI-STC-65</td>
<td>HOVENSA, west</td>
<td>B</td>
<td>1.2865, STC-22A Treatment Plant (POTW) Outfall, STC-21 Spoils Island (Ruth Island)</td>
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<tr>
<td>VI-STC-66</td>
<td>HOVENSA subwatershed, offshore</td>
<td>B</td>
<td>2.8305, There are currently no monitoring stations within this unit.</td>
<td></td>
</tr>
<tr>
<td>VI-STC-67</td>
<td>Southports St. Croix HUC14, offshore</td>
<td>B</td>
<td>8.1966, STC-OFF9 SW-3</td>
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<tr>
<td>VI-STC-68</td>
<td>Bethlehem subwatershed, inshore</td>
<td>B</td>
<td>0.2149, There are currently no monitoring stations within this unit.</td>
<td></td>
</tr>
<tr>
<td>VI-STC-69</td>
<td>Bethlehem subwatershed, offshore</td>
<td>B</td>
<td>0.3971, There are currently no monitoring stations within this unit.</td>
<td></td>
</tr>
<tr>
<td>VI-STC-70</td>
<td>Airport, nearshore</td>
<td>B</td>
<td>2.1943, There are currently no monitoring stations within this unit.</td>
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<tr>
<td>Station Code</td>
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<td>Classification</td>
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<tr>
<td>VI-STC-71</td>
<td>Airport, offshore</td>
<td>B</td>
<td>4.263</td>
<td>STC-OFF6 South-2</td>
</tr>
<tr>
<td>VI-STC-72</td>
<td>Airport St. Croix HUC14, offshore</td>
<td>B</td>
<td>4.1803</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-73</td>
<td>Diamond, nearshore</td>
<td>B</td>
<td>0.1699</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-74</td>
<td>Enfield Green Beach/VIRIL Outfall</td>
<td>B</td>
<td>0.1376</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-75</td>
<td>Diamond subwatershed, offshore</td>
<td>B</td>
<td>2.8479</td>
<td>STC-24B Rum Plant (VI Rum) Outfall</td>
</tr>
<tr>
<td>VI-STC-76</td>
<td>Carlton Beach</td>
<td>B</td>
<td>0.2447</td>
<td>STC-25 Long Point</td>
</tr>
<tr>
<td>VI-STC-77</td>
<td>Long Point Bay</td>
<td>B</td>
<td>0.8376</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-78</td>
<td>Long Point Bay subwatershed, offshore</td>
<td>B</td>
<td>4.9231</td>
<td>STC-OFF12 SW-4</td>
</tr>
<tr>
<td>VI-STC-79</td>
<td>Good Hope Beach</td>
<td>B</td>
<td>0.1876</td>
<td>STC-26 Good Hope Beach</td>
</tr>
<tr>
<td>VI-STC-80</td>
<td>Sandy Point, nearshore south</td>
<td>B</td>
<td>2.0121</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-81</td>
<td>Sandy Point, offshore south</td>
<td>B</td>
<td>7.4306</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
</tr>
<tr>
<td>VI-STC-82</td>
<td>Sandy Point, nearshore west</td>
<td>B</td>
<td>0.1158</td>
<td>STC-27 Sandy Point Public Beach, VI896490 Dorsch Bay, VI907985 Stony Ground</td>
</tr>
<tr>
<td>VI-STC-83</td>
<td>Sandy Point, offshore west</td>
<td>B</td>
<td>0.4875</td>
<td>There are currently no monitoring stations within this assessment unit.</td>
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<tr>
<td>VI-STC-84</td>
<td>Southwest St. Croix HUC14, offshore</td>
<td>B</td>
<td>18.347</td>
<td>STC-OFF3 SW-1</td>
</tr>
</tbody>
</table>

B. Classifications, Total Waters and Applicable Standards

The information on Water Quality Criteria by Classification and pollutant are summarized in Table II. B.1, below, which closely follows the wording of Virgin Islands Rules and Regulations.

**Designated Uses of Class A 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.

Legal Limits of Class A waters include:

(i) Within 0.5 miles of the boundaries of Buck Island’s Natural Barrier Reef, St. Croix.

(ii) Trunk Bay, St. John

**Designated Uses of Class B 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.

Legal Limits of Class B waters defined as all other coastal waters not classified Class “A” or Class “C”. In addition, those Class “B” waters not covered by color and turbidity criteria in Section 186-3(b)(11) [T. 12, Ch. 7] include:

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

(ii) St. Croix Coastal 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.

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

**Designated Uses of Class C 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.

Legal limits of Class C Waters defined as:
St. Thomas:

(a) St. Thomas Harbor beginning at Rupert Rock and extending to Haulover Cut.

(b) Crown Bay enclosed by a line from Hassel Island at Haulover Cut to Regis Point at West Gregerie Channel.

(c) Krum Bay

St. Croix:

(a) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.

(b) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.

(c) Hess Oil Virgin Islands Harbor (alternatively named HOVENSA Harbor).

(d) Martin-Marietta Alumina Harbor (alternatively named Port Alucroix or St. Croix Renaissance Group Harbor).

St. John:

(a) Enighed Pond Bay

Table II.B.1 Summary of US Virgin Islands Water Quality Criteria

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.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Class B</th>
<th>Class C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Oxygen</td>
<td>Not less than 5.5 mg/l from other than natural conditions</td>
<td>Not less than 5.0 mg/l from other than natural conditions</td>
</tr>
<tr>
<td>pH</td>
<td>&lt;8.3 Tolerable Limit &gt;7.0</td>
<td>&lt;8.5 Tolerable Limit &gt;6.7</td>
</tr>
<tr>
<td>Temperature</td>
<td>Not to exceed 32° Celsius at any time</td>
<td>Same as Class B</td>
</tr>
<tr>
<td><strong>Bacteria</strong></td>
<td>A geometric (log) mean of 70 fecal coliforms per 100 ml by MF or MPN count</td>
<td>A geometric (log) mean of 200 fecal coliforms per 100 ml by MF or MPN count</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>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</td>
</tr>
<tr>
<td><strong>Chlorine</strong></td>
<td>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</td>
<td>Same as Class B</td>
</tr>
<tr>
<td><strong>Phosphorus</strong></td>
<td>Not to exceed 50 ug/L any coastal waters</td>
<td>Same as Class B</td>
</tr>
<tr>
<td><strong>Suspended, colloidal or settleable solids</strong></td>
<td>None from waste water, which would cause deposition or be otherwise deleterious.</td>
<td>Same as Class B</td>
</tr>
<tr>
<td><strong>Oil and Floating substances</strong></td>
<td>No residue attributable to waste water. No visible film; no globules of grease</td>
<td>Same as Class B</td>
</tr>
</tbody>
</table>
| **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) | Same as Class B, but no NTU standard in Rules and Regulations |
The USVI Water Quality Standards were revised during this reporting cycle. The standards were promulgated in June 2010. The assessments outlined in this report were made based on the 2010 USVI Water Quality Standards.

Table II.B.2 Area of Water Classes by Island

<table>
<thead>
<tr>
<th>Class</th>
<th>St. Croix</th>
<th>St. Thomas</th>
<th>St. John</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>4.1172 sq. miles</td>
<td>---</td>
<td>0.0685 sq. miles</td>
<td>4.1857 sq. miles</td>
</tr>
<tr>
<td>Class B</td>
<td>244.89 sq. miles</td>
<td>272.95 sq. miles</td>
<td>79.958 sq. miles</td>
<td>597.8 sq. miles</td>
</tr>
<tr>
<td>Class C</td>
<td>2.2132 sq. miles</td>
<td>1.0323 sq. miles</td>
<td>---</td>
<td>3.2454 sq. miles</td>
</tr>
<tr>
<td>Total</td>
<td>251.2204 sq. miles</td>
<td>273.9823 sq. miles</td>
<td>80.0265 sq. miles</td>
<td>605.23 sq. miles</td>
</tr>
</tbody>
</table>

Figure II.B.2 Spatial Distribution of St. Croix Coastal Water Classes
Water quality standards for each class of designated use are provided in Table II.B.1.

**Water Quality Standards to Address Drinking Water Use Attainment**

The water quality standards do not address drinking water use attainment. Since most of the USVI’s drinking water supply comes from seawater purified by flash desalination or reverse osmosis and from traditional rainwater cisterns (still required for all new construction) most national drinking water issues directed at surface or groundwater resources are moot in the Virgin Islands. There are no drinking water source-based quality standards available for organic compounds (volatile, synthetic, herbicides, pesticides and PCB), inorganic compounds, unregulated chemicals, and radiological contaminants that apply to the ocean surrounding the US Virgin Islands because ocean water does not fit the definition of surface water under the Safe Drinking Water Act. Standards do exist under the Virgin Islands Rules and Regulations that demand natural existing conditions for waters designated Class A remain unchanged. Waters designated Class B should not exceed 70 fecal coliform per 100mL and waters designated Class C should not exceed 200 fecal coliform per 100mL. All waters of the Virgin Islands should not exceed a geometric mean of 35 enterococci per 100 ml or not to exceed a single sample maximum of 104 per 100 ml at any time. The reason that drinking water source-based standards are not developed in the US Virgin Islands is that drinking water is generally derived from cisterns holding rainwater at each house, or supplemented for public housing and in droughts and other emergencies by desalination of seawater, as a co-generation by-product of the Virgin Islands.
Water and Power Authority. The Water and Power Authority in St. Croix maintains some public water supply wells.

No surface water is used directly for any drinking water supply, although questions have been raised about whether sea water intakes of contaminated water is capable of passing bacterial contamination through the relatively low temperature (60° C) flash desalinization processes.

C. Water Pollution Control Program

Under the Water Pollution Control Grant (pursuant to CWA §106), the V.I. Department of Planning and Natural Resources (DPNR), Division of Environmental Protection (DEP) is entrusted with the task of monitoring the marine waters of the USVI, and controlling the discharges into those waters. To accomplish this task the Water Pollution Control Program (WPC) is organized into the following sub-programs:

- TERMINAL FACILITY LICENSE AND INSPECTION PROGRAM
- AMBIENT MONITORING PROGRAM
- TMDL DEVELOPMENT AND IMPLEMENTATION PROGRAM
- TERRITORIAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS PERMITTING AND COMPLIANCE PROGRAM
- VIRGIN ISLANDS BEACH MONITORING PROGRAM

The two WPC sub-programs that this report will concentrate its focus on are as follows:

1. The Territorial Pollutant Discharge Elimination Systems (TPDES) Permitting and Compliance Program permits and monitors point source waste streams, which are discharged into the waters of the VI, in accordance with the VI Water Quality Standards.

2. The Ambient Monitoring Program is the primary mechanism for monitoring the Virgin Islands coastal water quality.

1. Territorial Pollutant Discharge Elimination Systems Program

The Territorial Pollutant Discharge Elimination Systems (TPDES) Permitting and Compliance Program is a federally delegated program which determines what waste streams are allowed to be discharged into the waters of the Virgin Islands, TPDES Permits are issued in accordance to Title 12, Chapter 7 §184-11 of the Virgin Islands Rules and Regulations states, that “…no person shall discharge or cause a discharge of any pollutant without a TPDES permit having been issued to such person…”

TPDES permits require that point source discharges of pollution be monitored by the permittee (facility), and the self-monitoring results are submitted to DPNR-DEP and the United States Environmental Protection Agency (USEPA). Additionally, DPNR-DEP conducts compliance inspections and monitoring at all facilities that have been issued TPDES permits on an annual basis to ensure compliance. There are three types of compliance inspections conducted at TPDES permitted
facilities throughout the Territory - Compliance Sampling Inspections, Compliance Evaluation Inspections and Pump Station Inspections, which are conducted on a quarterly basis at the Territory’s Publicly Owned Treatment Works (POTW).

If a facility is repeatedly found to be in non-compliance with its TPDES permit or has been found to violate the USVI’s Water Quality Standards, enforcement actions may be taken against the facility. The enforcement action usually outlines corrective actions necessary for the facility to return to compliance and, if deemed necessary, fines may also be assessed. Facilities that are enforced against are usually granted the opportunity to work closely with the Department to develop a compliance schedule that sets the timeline for facility will use to achieve compliance.

If necessary or when requested, DPNR-DEP may work closely with the USEPA and the Department of Justice (DOJ) to address major enforcement cases. Cases this nature included an ongoing case against the Department of Public Works which is currently under Federal Consent Decree for unpermitted discharges caused by sewage treatment infrastructure problems throughout the Territory. In such cases, DEP is called upon to monitor the facility in question and produce supporting inspection reports and other pertinent documentation.

Regulated discharges and discharge sites include sewage treatment plant outfalls (both public and private facilities), brine discharges from reverse osmosis (and other technology) freshwater production plants, industrial facility process water discharges, and industrial facility drainage discharge.

The TPDES Program currently regulates discharges from sewage treatment plant outfalls (both public and private facilities), brine discharges from reverse osmosis, desalination freshwater production plants, industrial facility process water discharges.

TPDES Program has several components, all under the auspices of the Division of Environmental Protection:

- TPDES Permit Issuance;
- TPDES Compliance Inspections: Compliance Evaluation (CEI), Compliance Sampling (CSI) and Pump Station Inspections (PSI); and
- Enforcement

TPDES Permit Issuance:

Territorial TPDES permits are issued with effluent limitations pertinent to Federal and Local Regulations. The major industrial dischargers, which have permitted discharges of over 1 MGD, include, the HOVENSA Oil Refinery, VI Rum Distillery, Water and Power Authority in the St. Croix district; the Water and Power Authority and the Marriott Frenchman’s Reef on St. Thomas. The major municipal dischargers include the St. Croix POTW, Mangrove Lagoon POTW and Charlotte Amalie POTW. The TPDES Program also permits a number of minor industrial and municipal facilities.

Table II.C.1 US Virgin Islands TPDES Permits, 2008 and 2009
<table>
<thead>
<tr>
<th>Permit #</th>
<th>Facility Name</th>
<th>Permit Type</th>
<th>Priority</th>
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<tbody>
<tr>
<td>VI0000019</td>
<td>HOVENSA</td>
<td>Renewal</td>
<td>FY08</td>
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<tr>
<td>VI0040886</td>
<td>No. 7 Shoys</td>
<td>Renewal</td>
<td>FY08</td>
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<td>VI0040231</td>
<td>Grapetree Shores, Inc. (Divi)</td>
<td>Renewal</td>
<td>FY08</td>
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<tr>
<td>VI0040231</td>
<td>St. Croix Financial Center (Green Cay Marina)</td>
<td>Renewal</td>
<td>FY08</td>
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<tr>
<td>VI0000051</td>
<td>VIWAPA St. Croix</td>
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<td>FY09</td>
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<td>VI0040878</td>
<td>Reef Associates</td>
<td>Renewal</td>
<td>FY08</td>
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<tr>
<td>VI0050032</td>
<td>Coakley Bay Condos</td>
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<tr>
<td>VI0050318</td>
<td>Chris Powers Residence</td>
<td>New</td>
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<tr>
<td>VI0040151</td>
<td>Westin St. John Hotel</td>
<td>Modification</td>
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<td>VI0040525</td>
<td>Little St. James</td>
<td>Modification</td>
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<td>VI0040843</td>
<td>Sea Star (Doug Stewart)</td>
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<td>VI0040649</td>
<td>Texaco Tutu Service Station</td>
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<tr>
<td>VI0080080</td>
<td>Luvenlund Housing</td>
<td>Renewal</td>
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<tr>
<td>VI039829</td>
<td>Frenchmans’ Reef</td>
<td>Modification</td>
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<tr>
<td>VI0050253</td>
<td>Richard Borck Residence</td>
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<td>-</td>
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<tr>
<td>VI0080063</td>
<td>Raphune Vistas</td>
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<tr>
<td>VI0000051</td>
<td>WAPA-Richmond</td>
<td>Renewal</td>
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<tr>
<td>VI0040525</td>
<td>WAPA STJ</td>
<td>Renewal</td>
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<td></td>
<td>Tutu Groundwater Remediation</td>
<td>Renewal</td>
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<td>Wallace Leopold</td>
<td>New</td>
<td>-</td>
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<tr>
<td>VI0050226</td>
<td>Gentle Winds</td>
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<td>VI0040291</td>
<td>Coral World</td>
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<td>VI004035</td>
<td>Cruz Bay POTW</td>
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<td>VI002003</td>
<td>Mangrove Lagoon POTW</td>
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<td>VI0020044</td>
<td>Francois (Red Point)</td>
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<td>VI0020036</td>
<td>Nelthropp (Anguilla)</td>
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<td>VI0020052</td>
<td>CVL (Cruzan VIRIL Ltd.)</td>
<td>Renewal</td>
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<tr>
<td>VI0080012</td>
<td>Bolongo Bay Beach Resort</td>
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<tr>
<td>VI0040801</td>
<td>Hull Bay Hideaway</td>
<td>Renewal</td>
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<tr>
<td>VI0040746</td>
<td>Market Square East WWTP</td>
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<tr>
<td>VI0080004</td>
<td>Secret Harbour House III</td>
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<td>VI0040444</td>
<td>Dorothea Beach Condos</td>
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<td>FY08</td>
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<td>VI0080021</td>
<td>Dvergstem Company Inc. (LIMA)</td>
<td>New</td>
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<tr>
<td>VI0040584</td>
<td>Essence Properties</td>
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<tr>
<td>VI0039870</td>
<td>American Yacht Harbor</td>
<td>Renewal</td>
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<tr>
<td>VI0080055</td>
<td>Calabash Boom WWTF</td>
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### Construction General Permit Coverages – FY08

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<thead>
<tr>
<th>TPDES Permit #</th>
<th>Project Name</th>
<th>Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIGSA001</td>
<td>Reliance Housing (Calabash Boom)</td>
<td>STJ</td>
</tr>
<tr>
<td>VIGSA002</td>
<td>K &amp; C Development</td>
<td>STT</td>
</tr>
<tr>
<td>VIGSA003</td>
<td>Villa Green Leaf</td>
<td>STX</td>
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<tr>
<td>VIGSA004</td>
<td>Ahmed Abdulghani (#52 Hannah’s Rest)</td>
<td>STX</td>
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<tr>
<td>VIGSA005</td>
<td>Zenon Construction at Herman Hill</td>
<td>STX</td>
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<tr>
<td>VIGSA006</td>
<td>Stanford Airport Project</td>
<td>STX</td>
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<tr>
<td>VIGSA007</td>
<td>Island Crossing – Home Depot Project (Clearing Only)</td>
<td>STX</td>
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<tr>
<td>VIGSA008</td>
<td>Caribbean Petroleum</td>
<td>STT</td>
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<td>VIGSA009</td>
<td>Christiansted Bypass Project</td>
<td>STX</td>
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<td>VIGSA010</td>
<td>WMA - Susannaburg Transfer Station</td>
<td>STJ</td>
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<tr>
<td>VIGSA011</td>
<td>Santa Cruz Development Project – Estate Mt. Pleasant</td>
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<tr>
<td>VIGSA012</td>
<td>Raphune Vistas</td>
<td>STT</td>
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<td>VIGSA013</td>
<td>Golden Gaming Project</td>
<td>STX</td>
</tr>
<tr>
<td>VIGSA014</td>
<td>Greathouse Estates</td>
<td>STT</td>
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<td>VIGSA015</td>
<td>Spring Gut Road Project</td>
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<tr>
<td>VIGSA017</td>
<td>Montpellier Small Farm Subdivision</td>
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### Construction General Permit Coverages – FY09

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<td>St. Thomas Regional Library &amp; Archives Center</td>
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<td>VIGSA0019</td>
<td>Department of Public Works – Scenic Drive Road</td>
<td>STX</td>
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<tr>
<td>VIGSA0020</td>
<td>All Saints Cathedral School Athletic Field</td>
<td>STT</td>
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<td>VIGSA0021</td>
<td>VI Housing Authority – Louis E. Brown</td>
<td>STX</td>
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<tr>
<td>VIGSA0023</td>
<td>Frank C. Pollara Group LLC</td>
<td>STX</td>
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<tr>
<td>VIGSA0025</td>
<td>Hasmukh Ruparelia</td>
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<td>VIGSA0027</td>
<td>Island Crossing Development</td>
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<td>VIGSA0029</td>
<td>Department of Public Works – Queen Mary Highway</td>
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<td>VIGSA0031</td>
<td>North Shore Partners, Inc. – Estate Pearl Subdivision</td>
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<td>VIGSA0033</td>
<td>DIAGEO USVI (Distillery)</td>
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<td>VIGSA0035</td>
<td>GEC, LLC – Carlton Condos</td>
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<td>VIGSA0037</td>
<td>Sunny Isles Developer, LLC.</td>
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<td>VIGSA0039</td>
<td>DIAGEO USVI (Warehouse)</td>
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</table>
**TPDES Compliance Inspections:**
A schedule of compliance evaluation inspections (CEI) and compliance sampling inspections (CSI) is incorporated into the WPC program work-plan. In general, DEP staff conducts a CSI at major facilities and POTWs annually. Generally, facilities with minor permits receive only an annual CEI.

Table II.C.2 Summary of TPDES Activities, FY2008 - 2009

<table>
<thead>
<tr>
<th>FY2008</th>
<th>St. Thomas/St. John</th>
<th>St. Croix</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEI</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>CSI</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Supplementary</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FY2009</th>
<th>St. Thomas/St. John</th>
<th>St. Croix</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEI</td>
<td>41</td>
<td>10</td>
</tr>
<tr>
<td>CSI</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Supplementary</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>SCI</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

Additional inspections are conducted at the Territorial POTWs, including the major and minor pump stations. These inspections are scheduled quarterly.

Table II.C.3 Supplementary POTW Inspections: TPDES Activities, FY2008 - 2009

**FY2008 and FY2009**

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Permit #</th>
<th>Type</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Thomas Pump Stations</td>
<td>VI0039811 VI0039977 VI0020044 VI0002003 VI0020133</td>
<td>PSI (C)</td>
<td>1&lt;sup&gt;st&lt;/sup&gt;-4&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>St. John Pump Stations</td>
<td>VI0040835 VI0040266</td>
<td>PSI (C)</td>
<td></td>
</tr>
<tr>
<td>St. Croix Pump Station</td>
<td>VI0020036</td>
<td>PSI (C)</td>
<td></td>
</tr>
</tbody>
</table>
2. Other Ambient Monitoring Activities
As part of the Ambient Monitoring Program, the DEP staff takes part in reviews of the Environmental Assessment Reports (EARs) submitted by individuals or groups seeking to acquire land development or earth change permits within the Coastal Zone. EARs are submitted to the DPNR-Division of Coastal Zone Management (CZM), which, in turn, distributes them to various divisions for review. If the CZM permittee's application involves potential impacts to Waters of the U.S. Virgin Islands, a Water Quality Certificate is necessary as part of the CZM Water Permits.

During this reporting period, certificates that were issued are as follows:

Table II.C.4 Summary of Issued Water Quality Certificates, FY 2008 - 2009

FY2008

St. Croix District

There Water Quality Certificates were issued for the St. Croix District for FY2008.

St. Thomas/St. John District

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Water Quality Certificate #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethel Bryan (Inner Brass)</td>
<td>WQT-08-001(L&amp;W)</td>
</tr>
<tr>
<td>Compass Point Marina</td>
<td>WQT-08-002(W)</td>
</tr>
<tr>
<td>Thatch Cay, LLC</td>
<td>WQT-08-003(L&amp;W)</td>
</tr>
<tr>
<td>Island Green, LLC</td>
<td>WQT-08-004(W)</td>
</tr>
<tr>
<td>Essence Properties, LLC</td>
<td>WQT-08-005(W)</td>
</tr>
<tr>
<td>Island Tri-Corp, Inc.</td>
<td>WQT-08-006(W) - Cancelled</td>
</tr>
</tbody>
</table>

FY2009

St. Croix District

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Water Quality Certificate #</th>
</tr>
</thead>
</table>

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Golden Resorts LLLP  WQC-09-001(L&W)
William and Punch, LLC  WQC-09-002(L&W)
Bryan’s Marine Service, LLC  WQC-09-003(W)
Robin Bay Realty, LLC  WQC-09-004(W)

St. Thomas/St. John District

<table>
<thead>
<tr>
<th>Applicant</th>
<th>Water Quality Certificate #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marriott Ownership Resorts</td>
<td>WQT-09-001(W)</td>
</tr>
<tr>
<td>Wyndham Sugar Bay Resort &amp; Spa</td>
<td>WQT-09-002(W)</td>
</tr>
<tr>
<td>Tri-Island Corp.</td>
<td>WQT-09-003(W)</td>
</tr>
<tr>
<td>West Indian Company, Ltd.</td>
<td>WQT-09-004(W)</td>
</tr>
</tbody>
</table>

3. Enforcement Actions

Violations within the TPDES program can come from non-compliance with permitted effluent limits, or failure to report monitoring as required by the permit. This includes any special conditions contained within the permit. For example, St. Croix POTW permit requires the permittee to take several specific actions in the event of a bypass. Violations issued by DEP during this reporting period were:

Table II.C.5 Summary of TPDES Enforcement Activities, FY 2008 - 2009

<table>
<thead>
<tr>
<th>Against</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOVENSA</td>
<td>NOV</td>
<td>Pending</td>
</tr>
<tr>
<td>Reliance Housing</td>
<td>AO</td>
<td>Served; Settled</td>
</tr>
<tr>
<td>WAPA St. Croix</td>
<td>NOV</td>
<td>Pending</td>
</tr>
<tr>
<td>WMA</td>
<td>NOV</td>
<td>Served</td>
</tr>
<tr>
<td>Magens Point</td>
<td>NOV</td>
<td>Settled; Consent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agreement</td>
</tr>
<tr>
<td>Heavy Materials</td>
<td>NOV</td>
<td>Negotiations On-Going</td>
</tr>
</tbody>
</table>

FY2009
<table>
<thead>
<tr>
<th>Against</th>
<th>Type</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caneel Bay</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>HOVENSA LLC</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>St. Croix POTW</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>VI National Guard (STX)</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>Sunset Grill (unpermitted discharge)</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>Divi Carina Bay Resort</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>VI WMA</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>Giant Gas Station (TFL)</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>Boynes Trucking &amp; 3RC (TFL)</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>Salvage (vessel – oil spill)</td>
<td></td>
<td>NOV drafted</td>
</tr>
<tr>
<td>VIWMA (LBJ )</td>
<td>Administrative Order</td>
<td>Settlement Conference (Sept. 15, 09)</td>
</tr>
<tr>
<td>Food Center</td>
<td>NOV</td>
<td>Settlement Conference (May 7, 09)</td>
</tr>
</tbody>
</table>

WPC continued to participate in the Department of Justice Teleconferences which discussed the Department of Public Works/Waste Management Authority’s compliance with the Consent Decree.

**Storage and Retrieval Program (STORET)**
During this reporting cycle, DPNR-DEP began using the WQX_Web Template to catalog its water quality monitoring data. Once populated DPNR-DEP uploaded it to the Water Quality Exchange from which it can be queried using StoRet.

**Comprehensive Watershed Restoration Action Strategy**
USEPA guidelines request each state to develop a “comprehensive watershed assessment strategy.” The Department of Planning and Natural Resources continues to work towards its plans to implement this assessment in the current multi-year monitoring strategy.

**D. Non-Point Source Program**

Non-point source pollution, in the form of polluted runoff, impairs more water bodies than any other source of pollution in the Virgin Islands. Non-point source pollution in the Virgin Islands is caused by rainfall moving over and through the ground. As runoff moves, it picks up and carries away both natural pollutants and pollutants resulting from human activities. These pollutants include sediments, nutrients, pesticides, and toxic substances such as hydrocarbons and heavy metals. Eventually these pollutants are deposited in wetlands, coastal waters and ground water.

There are numerous problems associated with non-point source pollution. Two of the major non-point source problems affecting the Virgin Islanders are sedimentation and bacterial contamination.

- Sedimentation occurs when soil is eroded from the land surface, such as at construction sites,
and deposited onto the land surface or into coastal water bodies. Sedimentation results in problems such as habitat losses and marine life mortality.

- Bacterial contamination from sources such as failed septic systems, runoff from animal operations, and sewage discharged from boats can cause serious threats to human health

**THE NPS PROGRAM ACTIVITY MEASURES:**

1. *Waterbodies identified by States (in 2000 or subsequent years) as being primarily nonpoint source-impaired that will be partially or fully restored (cumulative).*

There are fourteen waterbodies identified with established total maximum daily loads (TMDL) as listed below:
<table>
<thead>
<tr>
<th>TMDL Water body</th>
<th>TMDL Impairment</th>
<th>TMDL Established</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benner Bay</td>
<td>Dissolved Oxygen</td>
<td></td>
</tr>
<tr>
<td>Benner Bay Lagoon</td>
<td>Dissolved Oxygen</td>
<td>Sept 30, 2003</td>
</tr>
<tr>
<td>Mangrove Lagoon</td>
<td>Biological Oxygen Demand</td>
<td></td>
</tr>
<tr>
<td>Salt River Bay</td>
<td>Dissolved Oxygen</td>
<td></td>
</tr>
<tr>
<td>Salt River Bay Lagoon</td>
<td>Dissolved Oxygen</td>
<td>Sept 24, 2004</td>
</tr>
<tr>
<td>Salt River Lagoon, Marina</td>
<td>Dissolved Oxygen</td>
<td></td>
</tr>
<tr>
<td>Salt River Lagoon, Sugar Bay</td>
<td>Dissolved Oxygen</td>
<td></td>
</tr>
<tr>
<td>Great Cruz Bay, St. John</td>
<td>Oil &amp; Grease</td>
<td></td>
</tr>
<tr>
<td>Red Hook Bay, St. Thomas</td>
<td>Oil &amp; Grease</td>
<td></td>
</tr>
<tr>
<td>Hassel Island at Haulover Cut to Regis Point, St. Thomas</td>
<td>Oil &amp; Grease</td>
<td>Sept 29 2005</td>
</tr>
<tr>
<td>Mangrove Lagoon, St. Thomas</td>
<td>Fecal Coliform</td>
<td></td>
</tr>
<tr>
<td>Benner Bay, St. Thomas</td>
<td>Fecal Coliform</td>
<td></td>
</tr>
<tr>
<td>Limetree Bay, St. Thomas</td>
<td>Fecal Coliform</td>
<td></td>
</tr>
<tr>
<td>Magens Bay, St. Thomas</td>
<td>Fecal Coliform</td>
<td></td>
</tr>
<tr>
<td>Vessup Bay, St. Thomas</td>
<td>Fecal Coliform</td>
<td></td>
</tr>
<tr>
<td>Hassel Island at Haulover Cut to Regis Point, St. Thomas</td>
<td>Fecal Coliform</td>
<td>Sept 19, 2006</td>
</tr>
<tr>
<td>North Shore St. Croix Assessment Units</td>
<td>Phosphorus, Biological Oxygen, Fecal Coliform, Sediment Oxygen Demand, Total Suspended Solids, Enterococcus Bacteria</td>
<td>Sept 26, 2007</td>
</tr>
</tbody>
</table>

*No TMDLs were established during this reporting period, FY2008-2009*
2. Reduction in amount of total sediment loadings (in tons).

Not measured and quantified – currently revising the multi-year monitoring strategy to assess sediment reductions. Additionally a contract is being developed for the characterization of guts (intermittent streams), within watersheds feeding a TMDL waterbody, in relation to their location, daily flow, and condition (Manning’s roughness coefficient). The contractor, Tetra Tech Inc, of Fairfax, Virginia is scheduled to begin work during the second quarter of FY10.

3. Reduction in amount of total nitrogen loadings (in pounds).

Not measured and quantified – currently revising the multi-year monitoring strategy to assess nitrogen reductions. Additionally a contract is being developed for the characterization of land use coefficients for use in determining NPS pollution loadings for parameters such as Biological Oxygen demand, nutrients (particularly nitrogen) sediment, bacteria, oil/grease, and impervious surfaces. The contractor, Tetra Tech Inc, of Fairfax, Virginia is scheduled to begin work during the second quarter of FY10.

4. Reduction in amount of total phosphorus loadings (in pounds).

Not measured and quantified – currently developing a multi-year monitoring strategy to assess load reductions. See discussions under items 2 and 3 above.

5. Number of watershed-based plans (and water miles/acres covered), supported under state Nonpoint Source Management Programs since the beginning of FY’02 that have been substantially implemented.

Two watershed-based plans have been substantially implemented.

Fish Bay Watershed Management Plan, St. John) - 4.2 gut miles (water miles) covering 1,487.6 acres. The Fish Bay watershed is experiencing rapid residential development and corresponding impacts from uncontrolled erosion, sediment and stormwater. VI RC&D was contracted by the V.I. Department of Planning & Natural Resources Coastal Zone Management Program (DPNR-CZM) to assist in designing and implementing best management practices (BMPs) to mitigate pollution in the Fish Bay watershed. The primary goal of the project was to develop a Comprehensive Road Stabilization Plan with Best Management Practices. For more details please visit http://www.usvircd.org/FishBayPhoto/Gallery/index.htm

The Coral Bay Watershed Management Plan was finalized in March 2008 through a collaborative effort of multiple local and Federal agencies, the Coral Bay Community Council (CBCC), and many local land owners and developers -- to serve as a guide for developing ways to protect Coral Bay from sediment and stormwater pollution. The plan provides a
comprehensive set of objectives and actions that address land use planning, protection and restoration of sensitive lands and aquatic buffers, better site design and construction techniques, and effective stormwater management. Please note that the selected example sites are representative; there are many more sites in Coral Bay that deserve equal attention. This plan document is being used now as a helpful outline to undertake detailed actual multi-agency and community discussions to plan activities and prioritize actions on achieving the objectives. The EPA CARE grant being received by CBCC for 2009 and 2010 will bring stormwater expertise to Coral Bay expressly to implement the plan. The plan can be reviewed at http://www.coralbaycommunitycouncil.org/watershed.htm. The Coral Bay watershed is

- 5th largest watershed in VI: 3003 ac.
- Fastest developing area in VI
- 79% growth rate 1990-2000 Census
- 750+ residents in 2000
- 5% developed – Huge potential
- Area of Particular Concern
- Coral Reef National Monument
- Longest V.I. fringing mangrove
- 100’s of acres of wetlands, coral reefs and seagrass beds

PROGRAM ACCOMPLISHMENTS

The NPS program can be subdivided into three sections:
1. Program Management to include development of total maximum daily loads (TMDLs)\(^1\) implementation plans and restoration plans for Virgin Island’s impaired waters; GIS capacity building, etc.
2. Section 319(h) nonpoint source control grants program; performs water quality restoration and educational projects
3. Earth Change permitting program in the second tier of the coastal zone.

Program Management

New Policies and Procedures were implemented during this reporting period as follows:

- Assessment of V.I. Zoning and Subdivision Code
  - The assessment was funded by $35,000.00 by DPNR’s Division of Comprehensive and Coastal Zone Planning (CCZP), and was completed in FY09. The assessment undertaken by Stuart Meck of Rutgers University and Marya Morris of the Chicago-based Duncan and Associates provided DPNR with critical findings and recommendations that would allow the Department to update and revise the close to forty year old zoning code. Of special interest to the NPS program are the following issues to be addressed:
    - Hillside development
    - Environmental and aesthetic controls

\(^1\) A TMDL is calculation of the maximum amount of a pollutant a water body can receive and still meet water quality standards.
Mixed uses
Conflicts among definitions, (such as those for mezzanines)
Natural hazards

Rules and regulations for telecommunication facilities

- In January 2009, the NPS program provided input into the development of draft due to the lack of standards and regulations in the V.I. Code that address such facilities. The first draft of the rules and regulations was completed and placed in the public domain in June 2009, when public hearings were conducted for feedback on same June 10-12, 2009. Thereafter, as a follow-up to the territorial public hearings that were conducted by the Planning Division in June, staff facilitated a workshop that was conducted on August 28, 2009 with stakeholders of the telecommunication industry, environmental groups, senators, attorneys and other interested persons, to garner their input in finalization of the draft rules and regulations prior to submittal to the Governor and the Office of the Attorney General.

Small Wind Energy System Ordinance.

- In conjunction with the VI Energy Office and as part of the Wind Energy Work Group, completed the final draft instruction sheet for applicants. The Application Guidelines Alternative Energy System will be used to ensure that applicants are made aware “up-front” the various permits and clearances.

- In conjunction with the VI Energy Office, and as part of the Wind Energy work group, completed the draft final version of the “Small Wind Energy System Ordinance.” The significant regulations as it relates to the earth change permitting program are as follows:
  - Tower Height: For all property sizes, the tower height shall be limited to 80 ft., provided that the application includes evidence that the proposed height does not exceed the height recommended by the manufacturer or distributor of the system.
  - Set-back: The setback of small wind energy systems from adjacent property and utility power lines shall not be less than the total height of the wind energy system. No part of the wind energy system structure, including guy wire anchors, may extend closer than the normally allowable setback distances to the property lines of the installation site as designated for the subject zoning district.

In conjunction with the University of the Virgin Islands, Department of Agriculture, explored the potential for a “bladed equipment operator” certification program. In addition, the certification program may be expanded to include certification process for site inspectors for storm water discharges.

In conjunction with UVI, provided input into the development of the USVI Ghut Monitoring project. The final plan on the use of ghut as recreational spaces in the USVI was produced by UVI and included recommendations to DPNR for incorporation into the earth change permitting review process.
• The Departmental Spatial Data Infrastructure Policy was completed and signed by Commissioner Robert Mathes. The policy establishes the following:
  ▪ All departments and programs are encouraged to share GIS data and to make framework data available in ESRI Shapefile format with FGDC based metadata.
  ▪ The DPNR GIS Work Group recommends that all data be submitted for use in a North American Datum of 1983 (NAD83) and a UTM20 North projection
  ▪ All new GIS and CAD information be created using NAD83.

• In conjunction with The Nature Conservancy, and as part of the GIS work group, participated in kickoff meeting of the Conservation Planning for the U.S. Virgin Islands’. This charter of this committee was developed to facilitate the development of a strategy to implement the Conservation Planning process for U.S. Virgin Islands. Products and process outcomes are as follows:
  ▪ Draft Conservation component of the USVI’s Comprehensive Land and Water Use Plan.
  ▪ Develop specific maps outlining zoning with regulations, vegetation map, marine and terrestrial use maps, significant natural resources and geological features, priority threats.
  ▪ Transfer of skills and technology for the DPNR to complete the process for the cultural component of the Comprehensive Land and Water Use Plan.

Inter-agency support

Technical assistance was also provided to other DPNR Divisions and Programs, such as Comprehensive and Coastal Zone Planning (CCZP) and the Groundwater Program for Land Development Permit Applications and Land Subdivision/Rezoning.

A total of six hundred and seventy three (673) applications were submitted for review for zoning compliance. Sixty five percent (65%) of the applications reviewed were for residential developments; eighteen percent (18%) for land clearing; ten percent (10%) for other; five percent (5%) for agricultural purposes and two percent (2%) for non-residential developments.

Table II.D.1 Earth Change Summary

<table>
<thead>
<tr>
<th>Earth Change Permit Applications Reviewed by Use FY 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential (New/Addition)</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>No. of Applications</td>
</tr>
</tbody>
</table>

The NPS program also reviewed hydrology reports and provide environmental clearance for land subdivision applications, in support of the Division of Comprehensive and Coastal Zone Planning. Applications were reviewed for wellhead protection area concerns and other hydro-geological parameters such as drainage, ground water availability, septic tank suitability, flood plain concerns,
etc. While the number of applications for subdivision processed this year remained the same as that of last fiscal year, there was a marked increase in the total acreage of property proposed for subdivision and the number of lots proposed for creation in the St. Croix District. The increase in subdivision activity is proposed for the Rattan and Sion Hill areas of St. Croix.

<table>
<thead>
<tr>
<th>SUBDIVISION APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FY 2009</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Preliminary</strong></td>
</tr>
<tr>
<td>St. Croix</td>
</tr>
<tr>
<td>Received</td>
</tr>
<tr>
<td>Approved</td>
</tr>
<tr>
<td>Total Lots</td>
</tr>
<tr>
<td>Total Acreage</td>
</tr>
<tr>
<td>Pending</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>FINAL</strong></td>
</tr>
<tr>
<td>St. Croix</td>
</tr>
<tr>
<td>Received</td>
</tr>
<tr>
<td>Approved</td>
</tr>
<tr>
<td>Total Lots</td>
</tr>
<tr>
<td>Total Acreage</td>
</tr>
<tr>
<td>Pending</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>PARTIAL FINAL</strong></td>
</tr>
<tr>
<td>St. Croix</td>
</tr>
<tr>
<td>Received</td>
</tr>
<tr>
<td>Approved</td>
</tr>
<tr>
<td>Total Lots</td>
</tr>
<tr>
<td>Total Acreage</td>
</tr>
<tr>
<td>Pending</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>PRELIMINARY/FINAL</strong></td>
</tr>
<tr>
<td>St. Croix</td>
</tr>
<tr>
<td>Received</td>
</tr>
</tbody>
</table>
During FY 2009, the NPS Program also participated in pre-application meetings and public hearings for zoning map amendments, in support of the Division of Comprehensive and Coastal Zone Planning. A total of fifteen (15) petitions for zoning map amendments were reviewed. Ten (10) of the fifteen (15) petitions were approved by the 28th Legislature, to include three (3) for St. Croix, three (3) for St. Thomas, and four (4) for St. John. Of the ten applications approved, seven (7) resulted in the rezoning of properties.

<table>
<thead>
<tr>
<th>Approved</th>
<th>4</th>
<th>4</th>
<th>5</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Lots</td>
<td>4</td>
<td>33</td>
<td>2</td>
<td>39</td>
</tr>
<tr>
<td>Total Acreage</td>
<td>5</td>
<td>15</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>Pending</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Zoning Map Amendments

![Zoning Map Amendments Graph]

Section 319 Contracts

During the reporting period, the NPS management plan was continually updated and reassessed to link the program’s implementation goals to the accomplishment of other related programs, including TMDL development, stormwater permitting, and CZARA implementation schedules pursuant to the Coastal Nonpoint Pollution Control Program of the Coastal Zone Management Division.

<table>
<thead>
<tr>
<th>319 Nonpoint Source Pollution Projects</th>
<th>Completion Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004 - Continuation and Expansion of the Territorial Biological (UVI)</td>
<td>100%</td>
</tr>
</tbody>
</table>

*The purpose of this task is to continue the biological monitoring program to track the health of one of our most sensitive and important biological resources – coral reefs.*

*Total award amount $52,380.00*
<table>
<thead>
<tr>
<th>Task Description</th>
<th>Award Amount</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2004- NPS Pollution for St. Croix Youths - Center for Marine &amp; Environmental Studies (UVI)</strong>&lt;br&gt;The purpose of this task is to help reduce nonpoint source pollution and increase awareness of NPS pollution among students. – Complete</td>
<td>$57,408.00</td>
<td>100%</td>
</tr>
<tr>
<td><strong>2004 - Nonpoint Source Pollution Committee Operating-Budget(UVI)</strong>&lt;br&gt;The NPS Pollution Control Committee was created in 1992 to provide oversight to the DEP-NPS Program, as stipulated in the 1989 VI NPS Management Plan. The committee operated on a shoestring budget with the primary participating agencies (DPNR, UVI/CES, USDA, VIRC&amp;D) providing funds for materials, supplied travel out of their individual budget.</td>
<td>$9,984.00</td>
<td>100%</td>
</tr>
<tr>
<td><strong>2004 – (DOA &amp; DPNR) Environmental Quality Incentive Program (EQIP)</strong>&lt;br&gt;goal is to install agricultural Best Management Practices to reduce nonpoint source pollution. The USDA-EQIP program is a cost shared program with the farmer whereby the farmer is responsible for a prescribed percentage of the cost.</td>
<td>$30,000.00</td>
<td>unknown%</td>
</tr>
<tr>
<td><strong>2004 - Clean Marinas Program – (DEP) In-House Project- Completed by the Water Pollution Program (STT)</strong>&lt;br&gt;To provide technical advice and educational material for marinas which would lead to a reduction in marina related pollution.</td>
<td>$22,000.00</td>
<td>100%</td>
</tr>
<tr>
<td><strong>2005 -2009 Nonpoint Source Pollution Conservation School –</strong>&lt;br&gt;The objective of this program was to increase the level of environmental awareness among Virgin Islands public schools and to encourage schools to manage resources in their school grounds to help mitigate Nonpoint Source Pollution.</td>
<td>$52,000.00</td>
<td>100%</td>
</tr>
<tr>
<td><strong>2005 – 2009 VI Nonpoint Source Pollution Conference –</strong>&lt;br&gt;Objective of this conference is to increase public and private sector awareness of nonpoint source pollution issues in the VI and to inform and educate regulators, businesses and contractors in the proper design of BMP’s to reduce or mitigate NPS pollution.</td>
<td>$30,000.00</td>
<td>100%</td>
</tr>
</tbody>
</table>
Wynham Sugar Bay Resort & Spa.

2005 – 2009 Estate Adventure Gut Restoration Demonstration Project

The purpose of this project is to restore riparian habitat and natural stream channel function in a designated corridor/buffer adjacent to the Estate Adventure Gut and Nature Trail.

Total award amount $26,840.00

2009-2010 TMDL data development and gut characterization in priority bays and watersheds in the USVI by TetraTech, Inc.

a). Characterization of land use coefficients for use in determining non-point source pollution loadings for parameters such as Biological Oxygen Demand, nutrients (particularly nitrogen), sediment, bacteria, oil/grease, and impervious surfaces

b). Characterization of guts within watersheds feeding a TMDL waterbody in relation to their location, daily flow, and condition (Manning’s roughness coefficient)

Total award amount ($60,643)

VI Wellhead Protection Program Actualization Project by Rural Community Assistance Program (RCAP), Inc

Prioritization of WHPP

Total award amount ($32,640)

Earth Change Permitting

An earth change permit is required before any real property can be cleared, graded, filled, or otherwise disturbed. Erosion and sedimentation resulting from improper construction and land clearing activities has been identified as the major nonpoint source problem in the Virgin Islands. The earth change permitting program is designed for residential development; facilities an acre or less in size. Larger facilities will be regulated under the Stormwater permitting discussed under Task 4 below. The earth change permitting program will emphasize the implementation of non-point source pollution controls, including sediment control, erosion mitigation measures, and protection of coastal and ground water resources.

The total number of earth change permits issued during this reporting period are as follows:

Earth Change Summary

<table>
<thead>
<tr>
<th>District</th>
<th>Earth Change Applications Reviewed</th>
<th>Earth Change Applications Approved</th>
<th>Earth Change Applications Denied</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Croix</td>
<td>10/08-9/09: 408 10/07-9/08: 512</td>
<td>10/08-9/09: 408 10/07-9/08: 512</td>
<td>10/08-9/09: 0 10/07-9/08: 0</td>
</tr>
</tbody>
</table>
The breakdown by category for FY08 is shown below. FY09 exhibits a similar distribution.

**Earth Change by Category FY08**

```
<table>
<thead>
<tr>
<th>Category</th>
<th>FY08 Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>16%</td>
</tr>
<tr>
<td>Land Clearing</td>
<td>56%</td>
</tr>
<tr>
<td>Construction-NEW</td>
<td>10%</td>
</tr>
<tr>
<td>Construction-ADDITION</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>16%</td>
</tr>
</tbody>
</table>
```

Data management
All earth change permits issued were entered into the database. DPNR has contracted Ventera to develop online capabilities for the earth change permitting system. Ventera will provide an enterprise content management solution that will automate the Earth Change Permit Application Process. The project, as proposed, will be initiated in the first quarter of FY10 and is briefly summarized below.

<table>
<thead>
<tr>
<th>Project: OnBase® Permitting Process- Earth Change Permit Process</th>
<th>Date: 10/13/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency 2 Proposal for Earth Change</td>
<td></td>
</tr>
<tr>
<td>Requestor:</td>
<td>DPNR</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
</tr>
</tbody>
</table>

**Business Case:** In an effort to reduce resource use and improve the efficiency of the permitting process, the Department of Natural Resources would greatly benefit from implementing the automation of the forms relating to the ‘Earth Change Permit Process’.

**Tasks Undertaken:** Ventera will provide an enterprise content management solution that will automate the Earth Change Permit Application Process. The solution will be implemented in the following phases

1. **Discovery Phase-** will include analysis of the existing process and will involve a number of activities geared towards gathering requirements. At the end of this stage a composite requirements document called the ‘Discovery Document’ will be delivered.

2. **Design Phase-** will involve the design of the automated workflows, eForms, work queues, decision points. The functional and technical specifications are enumerated and designed during this stage. The deliverable will include a Design Document outlining the specs.

3. **Build Phase –** Following the approval of the Design Document by DPNR, Ventera will create the eForms, work queues and work flows in the existing OnBase environment.

4. **Training Phase -** will be done in two parts: customer training and system testing. The goal is to prepare and educate the business users on how to interact with the solution. The training will be followed by the user acceptance testing which will include an end-to-end test plan that incorporates all facets of the solution. Simultaneously, we will conduct training to educate end-users on how to interact with the solution. The deliverables at this stage will include a training and UAT plan. The users will be given test plans to test various scenarios that they face in their day to day operations.

5. **Roll Out Phase -** Ventera will move the development/testing environment to the production OnBase server. Ventera will also work with DPNR to ‘turn on’ the application to the internal DPNR users and to its customers.

**Impact Statement:** The Earth Change Process will reside on the existing On Base Building Permit Process hardware and network infrastructure. No additional hardware or software is required since DPNR has already invested in the existing system. Through the use of electronic forms and automated workflows DPNR Earth Change will realize a significant improvement in process flow and functionality. External users will be able to submit forms and receive notifications all electronically once the system is in production.

**Affected Artifacts/Documentation:**
- Earth Change Permit Application Form I- Gut Clearing/Brush Clearings Only

**Affected Lines of Code:** This section is not applicable for the proposed solution.
Issues/challenges encountered during this reporting period.

1. Onsite Sewage Treatment System Regulations
Septic System regulations and regulatory authority needs to better defined for second tier of the coastal zone. Currently there is overlapping and conflicting jurisdictions between the Waste Management Authority, Department of Health, and DPNR in the various statutes and regulations. There is a need to develop permitting process to include monitoring and pump out requirements.

2. Staffing needs
The Nonpoint Source program has developed an earth change action plan (during FY08) in an effort to improve on the earth change permitting and enforcement process. The action plan calls for two new positions within the Earth change program to facilitate timely review of applications and increased earth change enforcement actions. Implementation of the “Save our Soils” (SOS) initiative, partly through the adoption and implementation of the Earth Change Action Plan by management. The plan is comprised the following:
- Increase Enforcement capability – need to revise regulations especially with respect to issuance of administrative orders and stop work orders.
- Increase Inter-Divisional Permit Review – TMDL/Stormwater review in TMDL watersheds; septic system requirements and performance standards for water treatment plants; development in the floodplain, etc.

3. TMDL implementation
The NPS program was not able to facilitate the interdisciplinary approach necessary to achieve successful implementation of the TMDLs developed to date. The most fundamental element that will make the TMDL implementation more effective will be the involvement and integration of the different federal and local agencies and the citizens.

4. Driveway Permit
Beginning on May 7, 2008, attempted to address the subject of driveway permits for access onto public roads as many public roads on St. Thomas are being undermined by improperly constructed driveways. The issue at hand is the definition of what constitutes a “public road” versus an “estate road”. It was finally determined that an earth change permit will be issued without the requisite driveway permit, and it is the applicant’s responsibility to obtain a driveway permit from the Department of Public Works.
E. Solid Waste Program

Under Section 1553(g) of the Virgin Islands Code, the US Virgin Islands Government DPNR is authorized to enforce provisions related to environmental effects of waste disposal, resource recovery and hazardous wastes. Pursuant to Section 1560 of the Virgin Islands Code, the Commissioner of DPNR exercised his authority to promulgate rules and regulations for a Used Oil Collection Program under Title 19, Part VI, Chapter 56 of the Virgin Islands Rules and Regulations.

Within three years after its inception, the Used Oil Program issued more than 173 permits to facilities territory-wide. These permits were only valid for three years, and subsequently expired. Facilities are, therefore, required to submit updated information regarding their used oil management, and renew the permits to generate, store or transport used oil every three years.

The tables below provide a listing of used oil permits by District. All of the permits are listed to reflect the universe of facilities that have been issued permits to date, even if some permits are currently expired. Several businesses have become defunct since the previous reporting period or are no longer generating used oil, and those facilities are no longer included in the database.

One of the objectives of the Solid Waste Program’s enforcement strategy is to pursue enforcement against facilities that have failed to renew their permits. Pursuant to Tile 19 of the Virgin Islands Code, these facilities will be issued a Notice of Noncompliance initially, and enforcement will be escalated if compliance is not achieved within the corrective action period.

F. Oil and Hazardous Materials

1. Underground Storage Tank Program

The Underground Storage Tank Program has undergone management changes during last few years and has undergone a considerable amount of progress during this time. Draft regulations are in development to support the Underground Storage Tank Act (12 V.I.C. §§ 651-684) that authorizes the Virgin Islands Department of Planning and Natural Resources to manage the underground storage tank program. A permitting program was implemented by 12 V.I.C. §§ 658-660 in order to better track UST systems and their compliance status. The program requires all UST facilities to apply for permits to use/operate, upgrade, and close their systems; in addition EPA notifications are required with each application.

Presently, compliance is the main ambition of the UST program. DPNR is working with each service station to promote compliance efforts in terms of financial responsibility and sufficient leak detection monitoring. These issues are important to ensure the protection of the island’s groundwater and DPNR is working to ensure that satisfactory leak detection monitoring will be conducted in the future. In doing so, DPNR intends to determine the full extent of leaking USTs within the territory.

The Leaking Underground Storage Tanks (LUST) program is an important issue to be addressed. The program is implemented, however, the status list needs to be updated on a continuous basis. DPNR was awarded $80,000 in ARRA funds to address the LUST Sites.
The LUST list to date is as follows:

**St. Croix**
1. Texaco-Midway s/s
2. Esso-Estate Glynn
3. Esso-Farmingdale s/s
4. Esso-Estate Mint s/s
5. Esso-Hassan s/s
6. LaRaine s/s

**St. Thomas**
1. Esso-Devcon
2. Esso-Gottlieb s/s
3. Esso-One Stop Sugar Estate s/s

**St. John**
None to date.

DPNR is investigating the status to date on each of these sites.

UST enforcement is in full force. A Civil Action Penalty Matrix was drafted for the program and an enforcement policy has been initiated. DPNR has issued numerous Notices of Violation.

2. The Used Oil Program

**Table II.E.1.a List of Used Oil Permit Holders – St. Thomas-St. John District**

<table>
<thead>
<tr>
<th>Permit</th>
<th>Date</th>
<th>Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>238T</td>
<td>12/31/2011</td>
<td>Carty’s Auto Repair, Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>237T</td>
<td>12/31/2010</td>
<td>M &amp;S Auto Inc</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>224C</td>
<td>12/31/2010</td>
<td>VI Recycling Company</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>223T</td>
<td>12/31/2009</td>
<td>Joel’s Auto Repair Tech</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>220T</td>
<td>12/31/2009</td>
<td>Amalie Car Rental</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>128T</td>
<td>12/31/2009</td>
<td>Trans Caribbean Dairy</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>125J</td>
<td>12/31/2009</td>
<td>Varlack Ventures, Inc</td>
<td>St. John</td>
</tr>
<tr>
<td>120T</td>
<td>12/31/2009</td>
<td>Automotive Enterprises Inc. dba Midas</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>118J</td>
<td>12/31/2009</td>
<td>P&amp;S Trucking &amp; Water Delivery</td>
<td>St. John</td>
</tr>
<tr>
<td>109T</td>
<td>12/31/2009</td>
<td>U.S. Postal Service Aubrey C. Ottley Branch-GPO</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>039T</td>
<td>12/31/2009</td>
<td>It's Black It's White</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>201J</td>
<td>12/31/2008</td>
<td>Pimpy’s Trucking</td>
<td>St. John</td>
</tr>
<tr>
<td>200T</td>
<td>12/31/2008</td>
<td>MOF VI Limited Partnership/DBA American Yacht Harbor</td>
<td>St. Thomas</td>
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<tr>
<td>138T</td>
<td>12/31/2008</td>
<td>Discount Water Deliveries and Trucking Services</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>131T</td>
<td>12/31/2008</td>
<td>University of The Virgin Islands</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>T</td>
<td>Date</td>
<td>Description</td>
<td>Location</td>
</tr>
<tr>
<td>---</td>
<td>------------</td>
<td>--------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>126T</td>
<td>12/31/2008</td>
<td>Crowley Liner Services (STT)</td>
<td>St. Thomas</td>
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<tr>
<td>089T</td>
<td>12/31/2008</td>
<td>Lennards Auto Repairs</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>076T</td>
<td>12/31/2008</td>
<td>Sapphire Beach Resort Marina</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>056T</td>
<td>12/31/2008</td>
<td>N &amp; S Auto Services</td>
<td>St. Thomas</td>
</tr>
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<td>188T</td>
<td>12/31/2007</td>
<td>Lew Henley’s Sewage Disposal L.L.C.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>158T</td>
<td>12/31/2007</td>
<td>VI Cement and Building Products Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>151T</td>
<td>12/31/2007</td>
<td>Matthews Auto Repairs</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>150T</td>
<td>12/31/2007</td>
<td>VI Recycling Company</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>149T</td>
<td>12/31/2007</td>
<td>Castillo Auto Repair</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>146T</td>
<td>12/31/2006</td>
<td>Innovative Telephone</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>145T</td>
<td>12/31/2006</td>
<td>Antilles Gas (STT)</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>143T</td>
<td>12/31/2006</td>
<td>Sanitary Trashmoval Services Inc.</td>
<td>St. Thomas</td>
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<tr>
<td>142T</td>
<td>12/31/2006</td>
<td>Cowpet Bay West</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>140T</td>
<td>12/31/2006</td>
<td>Chuck Kline Water</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>139T</td>
<td>12/31/2006</td>
<td>Challenger's Transport</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>137T</td>
<td>12/31/2006</td>
<td>Tutu Texaco Service Station Inc</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>136T</td>
<td>12/31/2006</td>
<td>Pueblo Supermarket</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>135T</td>
<td>12/31/2006</td>
<td>Bohlke International Airway, Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>134T</td>
<td>12/31/2006</td>
<td>Air St. Thomas</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>133T</td>
<td>12/31/2006</td>
<td>Air Center Helicopters</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>132T</td>
<td>12/31/2006</td>
<td>Ritz-Carlton Resort</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>130T</td>
<td>12/31/2006</td>
<td>United Brothers Trucking</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>129J</td>
<td>12/31/2006</td>
<td>O’Connor Car Rental*</td>
<td>St. John</td>
</tr>
<tr>
<td>129J</td>
<td>12/31/2006</td>
<td>St. John Development dba Texaco</td>
<td>St. John</td>
</tr>
<tr>
<td>125T</td>
<td>12/31/2006</td>
<td>Motor Trend</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>124T</td>
<td>12/31/2006</td>
<td>Amco Auto Sales &amp; Service Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>123T</td>
<td>12/31/2006</td>
<td>Compass Point Marina, Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>122T</td>
<td>12/31/2006</td>
<td>V.I. Housing Authority</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>121T</td>
<td>12/31/2006</td>
<td>Wyndham Sugar Bay Resort</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>119T</td>
<td>12/31/2006</td>
<td>Metro Motors</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>117T</td>
<td>12/31/2006</td>
<td>Four Star Aviation, Inc.</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>116T</td>
<td>12/31/2006</td>
<td>Dependable Car Rental</td>
<td>St. Thomas</td>
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<tr>
<td>114T</td>
<td>12/31/2006</td>
<td>Florida Coca Cola Bottling Comp.-St. Thomas</td>
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<tr>
<td>113J</td>
<td>12/31/2006</td>
<td>Boyson Inc</td>
<td>St. John</td>
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<tr>
<td>112T</td>
<td>12/31/2006</td>
<td>VI Enterprises, Inc. (Avis)</td>
<td>St. Thomas</td>
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<tr>
<td>111T</td>
<td>12/31/2006</td>
<td>Auto Excellence</td>
<td>St. Thomas</td>
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<td>110T</td>
<td>12/31/2006</td>
<td>Domino Oil Co. Inc.</td>
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<td>108T</td>
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<td>American Eagle dba Executive Airlines</td>
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<tr>
<td>106T</td>
<td>12/31/2006</td>
<td>V.I. Department of Public Works (Bovoni)</td>
<td>St. Thomas</td>
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<tr>
<td>105J</td>
<td>12/31/2006</td>
<td>Public Works (Susannah)</td>
<td>St. John</td>
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<tr>
<td>105J</td>
<td>12/31/2006</td>
<td>V.I. Department of Public Works (St. John)</td>
<td>St. Thomas</td>
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<tr>
<td>104TT</td>
<td>12/31/2006</td>
<td>V.I. Department of Public Works (Subbase) Trans</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>Code</td>
<td>Date</td>
<td>Description</td>
<td>Location</td>
</tr>
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<td>------</td>
<td>------------</td>
<td>---------------------------------------------------------</td>
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<td>104T</td>
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<td>Public Works (#8 Subbase)</td>
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<td>V.I. Department of Public Works (Sub Base)</td>
<td>St. Thomas</td>
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<td>103T</td>
<td>12/31/2006</td>
<td>The Auto Clinic</td>
<td>St. Thomas</td>
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<td>101T</td>
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<td>Patrick Charles Enterprises Inc.</td>
<td>St. Thomas</td>
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<td>099T</td>
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<td>Heavy Materials (formerly St. Thomas Concrete)</td>
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<td>098T</td>
<td>12/31/2006</td>
<td>Western Auto Supply Co (STT)</td>
<td>St. Thomas</td>
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<tr>
<td>098J</td>
<td>12/31/2006</td>
<td>Caneel Bay Resort</td>
<td>St. John</td>
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<td>097C</td>
<td>12/31/2006</td>
<td>Buccaneer Hotel</td>
<td>St. Thomas</td>
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<td>096T</td>
<td>12/31/2006</td>
<td>Bussue Auto &amp; Repair</td>
<td>St. Thomas</td>
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<tr>
<td>092T</td>
<td>12/31/2006</td>
<td>School Busing, Inc</td>
<td>St. Thomas</td>
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<tr>
<td>080T</td>
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<td>V.I. Port Authority, Transportation (STT)</td>
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</tr>
<tr>
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<td>12/31/2005</td>
<td>Ge-Tech Auto Repair</td>
<td>St. Thomas</td>
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<tr>
<td>094T</td>
<td>12/31/2005</td>
<td>Hertz Rent A-Car</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>091J</td>
<td>12/31/2005</td>
<td>Barry's Auto Service Center</td>
<td>St. John</td>
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<tr>
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<td>12/31/2005</td>
<td>Contran Resorts, Inc. dba Mahogany Run Golf Course</td>
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<td>12/31/2005</td>
<td>Mahogany Run</td>
<td>St. Thomas</td>
</tr>
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<td>088J</td>
<td>12/31/2005</td>
<td>E. C. Gas &amp; Service Station, Inc.</td>
<td>St. John</td>
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<td>Marriott Frenchman's Reef &amp; Morning Star Beach Resort</td>
<td>St. Thomas</td>
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<td>077T</td>
<td>12/31/2005</td>
<td>CTF Hotel Management Corp</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>077T</td>
<td>12/31/2005</td>
<td>Grand Beach Palace *</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>075T</td>
<td>12/31/2005</td>
<td>A.J. System</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>075T</td>
<td>12/31/2005</td>
<td>SK Cove</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>073T</td>
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<td>American Yacht Harbor Marina</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>072TT</td>
<td>12/31/2005</td>
<td>VI Regulated Waste Management, Inc</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>069TT</td>
<td>12/31/2005</td>
<td>Green Hornet Environmental Management Inc</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>068T</td>
<td>12/31/2005</td>
<td>Budget Car Rental</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>067T</td>
<td>12/31/2005</td>
<td>Yacht Haven (Long Bay Partners)</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>066T</td>
<td>12/31/2005</td>
<td>John's Auto Center, Inc.</td>
<td>ST. Thomas</td>
</tr>
<tr>
<td>065T</td>
<td>12/31/2005</td>
<td>Community Motors, Inc.</td>
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<tr>
<td>063T</td>
<td>12/31/2005</td>
<td>Crown Bay Marina</td>
<td>St. Thomas</td>
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<tr>
<td>061J</td>
<td>12/31/2005</td>
<td>Coral Bay Marina Services, Inc.</td>
<td>St. John</td>
</tr>
<tr>
<td>052T</td>
<td>12/31/2004</td>
<td>Gas Station Auto Repair</td>
<td>St. John</td>
</tr>
<tr>
<td>051T</td>
<td>12/31/2004</td>
<td>HI Performance Auto Repair</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>049T</td>
<td>12/31/2004</td>
<td>Tropical Marine, Inc.</td>
<td>ST. Thomas</td>
</tr>
<tr>
<td>046T</td>
<td>12/31/2004</td>
<td>Sun, Sea &amp; Sand Leasing &amp; Sales</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>041T</td>
<td>12/31/2004</td>
<td>East End Wreck Shop</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>037T</td>
<td>12/31/2004</td>
<td>Caribbean Auto Mart</td>
<td>St. Thomas</td>
</tr>
<tr>
<td>037R</td>
<td>12/31/2004</td>
<td>Caribbean Auto Mart, Inc. (STT)</td>
<td>St. Thomas</td>
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</tbody>
</table>
* Denotes facilities that have either gone out of business or are no longer generating used oil.

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Facility Name</th>
<th>District</th>
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</thead>
<tbody>
<tr>
<td>001T</td>
<td>12/31/2004</td>
<td>Allenton Auto Repairs</td>
<td>St. Thomas</td>
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<td>004T</td>
<td>12/31/2003</td>
<td>Nadir Esso Service Center</td>
<td>St. Thomas</td>
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Table II.E.1.b  List of Used Oil Permit Holders – St. Croix District

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<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Facility Name</th>
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<tr>
<td>031C</td>
<td>12/31/2010</td>
<td>H.H. Tire Sales</td>
<td>St. Croix</td>
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<tr>
<td>172C</td>
<td>12/31/2010</td>
<td>Old Time Auto Repair Shop</td>
<td>St. Croix</td>
</tr>
<tr>
<td>168C</td>
<td>12/31/2010</td>
<td>Unique Auto Repair</td>
<td>St. Croix</td>
</tr>
<tr>
<td>169C</td>
<td>12/31/2010</td>
<td>University of the Virgin Islands</td>
<td>St. Croix</td>
</tr>
<tr>
<td>058C</td>
<td>12/31/2010</td>
<td>VI Regulated Waste Management, Inc.</td>
<td>St. Croix</td>
</tr>
<tr>
<td>134C</td>
<td>12/31/2009</td>
<td>Abramson Enterprises</td>
<td>St. Croix</td>
</tr>
<tr>
<td>144C</td>
<td>12/31/2009</td>
<td>Antilles Gas (STX)</td>
<td>St. Croix</td>
</tr>
<tr>
<td>115C</td>
<td>12/31/2009</td>
<td>Bohlke International Airways</td>
<td>St. Croix</td>
</tr>
<tr>
<td>131C</td>
<td>12/31/2009</td>
<td>Centerline Car Rental</td>
<td>St. Croix</td>
</tr>
<tr>
<td>152C</td>
<td>12/31/2009</td>
<td>David's Auto Repair</td>
<td>St. Croix</td>
</tr>
<tr>
<td>165C</td>
<td>12/31/2009</td>
<td>Divi Carina Bay Resort</td>
<td>St. Croix</td>
</tr>
<tr>
<td>155C</td>
<td>12/31/2009</td>
<td>Frank's Garage</td>
<td>St. Croix</td>
</tr>
<tr>
<td>145C</td>
<td>12/31/2009</td>
<td>Human Services maintenance</td>
<td>St. Croix</td>
</tr>
<tr>
<td>164C</td>
<td>12/31/2009</td>
<td>Innovative Telephone Company</td>
<td>St. Croix</td>
</tr>
<tr>
<td>151C</td>
<td>12/31/2009</td>
<td>MARCO St. Croix, Inc. Water and Trucking Services</td>
<td>St. Croix</td>
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<tr>
<td>166C</td>
<td>12/31/2009</td>
<td>Monarch Heavy Equipment Rental</td>
<td>St. Croix</td>
</tr>
<tr>
<td>146C</td>
<td>12/31/2009</td>
<td>Olympic Rent-A-Car</td>
<td>St. Croix</td>
</tr>
<tr>
<td>033C</td>
<td>12/31/2009</td>
<td>Rodney's Auto Repair</td>
<td>St. Croix</td>
</tr>
<tr>
<td>141C</td>
<td>12/31/2009</td>
<td>Seaborne Airlines</td>
<td>St. Croix</td>
</tr>
<tr>
<td>035C</td>
<td>12/31/2009</td>
<td>St. Croix Foreign Auto Sales Corp</td>
<td>St. Croix</td>
</tr>
<tr>
<td>154C</td>
<td>12/31/2009</td>
<td>Tonges Concrete</td>
<td>St. Croix</td>
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<td>131T</td>
<td>12/31/2009</td>
<td>University of the Virgin Islands (STT)</td>
<td>St. Croix</td>
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<tr>
<td>135C</td>
<td>12/31/2009</td>
<td>Virgin Islands Rum</td>
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<td>161C</td>
<td>12/31/2009</td>
<td>Welco Gas Station</td>
<td>St. Croix</td>
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<td>103C</td>
<td>12/31/2008</td>
<td>Budget Car Rental</td>
<td>St. Croix</td>
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<tr>
<td>071C</td>
<td>12/31/2008</td>
<td>Caribbean Auto Mart St. Croix, Inc.</td>
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<td>Metro Motors</td>
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<td>083C</td>
<td>12/31/2008</td>
<td>St. Croix Marine</td>
<td>St. Croix</td>
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<tr>
<td>174CT</td>
<td>12/31/2007</td>
<td>Chitolie Trucking Equipment</td>
<td>St. Croix</td>
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<tr>
<td>170C</td>
<td>12/31/2007</td>
<td>Francis Water Services</td>
<td>St. Croix</td>
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<tr>
<td>175CT</td>
<td>12/31/2007</td>
<td>M &amp; T Trucking</td>
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</tr>
<tr>
<td>Code</td>
<td>Date</td>
<td>Company Name</td>
<td>Location</td>
</tr>
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<td>------------</td>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>171C</td>
<td>12/31/2007</td>
<td>Ramco Transmission Repair</td>
<td>St. Croix</td>
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<tr>
<td>173C</td>
<td>12/31/2007</td>
<td>Tonn Motor Corp.</td>
<td>St. Croix</td>
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<tr>
<td>006C</td>
<td>12/31/2007</td>
<td>V.I. Department of Public Works (Anna's Hope) DIY</td>
<td>St. Croix</td>
</tr>
<tr>
<td>148C</td>
<td>12/31/2006</td>
<td>A+ Auto Repair *</td>
<td>St. Croix</td>
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<tr>
<td>143C</td>
<td>12/31/2006</td>
<td>Anthony Auto Repair &amp; Maintenance</td>
<td>St. Croix</td>
</tr>
<tr>
<td>126C</td>
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<td>Bates Trucking &amp; Trash Removal</td>
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<tr>
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<td>Caribout aka Florida Coca-Cola Bottling Company</td>
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<tr>
<td>150C</td>
<td>12/31/2006</td>
<td>Champion Auto Part</td>
<td>St. Croix</td>
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<tr>
<td>163C</td>
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<td>Department of Public Works (Maintenance)</td>
<td>St. Croix</td>
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<tr>
<td>142C</td>
<td>12/31/2006</td>
<td>Europa Motorworks *</td>
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<td>H &amp; H Avionics</td>
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<tr>
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<td>HOVENSA</td>
<td>St. Croix</td>
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<td>12/31/2006</td>
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<tr>
<td>149C</td>
<td>12/31/2006</td>
<td>P.M. Auto</td>
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<tr>
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<td>PM's Auto Inc.</td>
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<td>Thrifty Car Rental</td>
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<td>156C</td>
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<td>St. Croix</td>
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<td>12/31/2006</td>
<td>V.I. Water &amp; Power Authority</td>
<td>St. Croix</td>
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<td>137C</td>
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<td>VI Paving, Inc.</td>
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<td>133C</td>
<td>12/31/2006</td>
<td>WAPA Maintenance</td>
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<td>A &amp; G Tire &amp; Auto Service *</td>
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<td>Chitolie Trucking &amp; Equipment</td>
<td>St. Croix</td>
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<td>086C</td>
<td>12/31/2005</td>
<td>Gold Coast Yachts Inc.</td>
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<td>018C</td>
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<td>Marine Spill Response Corporation</td>
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<td>Public Works (Anna's Hope)</td>
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<td>062TT</td>
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<td>Puerto Rico Used Oil Collectors, Inc.</td>
<td>San Juan, PR</td>
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<td>078C</td>
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<td>Stanley &amp; Stanley</td>
<td>St. Croix</td>
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<tr>
<td>094T</td>
<td>12/31/2005</td>
<td>Tropical Automotive Repair</td>
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</tr>
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<td>082T</td>
<td>12/31/2005</td>
<td>V.I. Army National Guard (STT)</td>
<td>St. Croix</td>
</tr>
<tr>
<td>081C</td>
<td>12/31/2005</td>
<td>V.I. Army National Guard (STX)</td>
<td>St. Croix</td>
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<td>030C</td>
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<td>Bill Auto Repair &amp; Maintenance</td>
<td>St. Croix</td>
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<tr>
<td>045C</td>
<td>12/31/2004</td>
<td>Sun Sea &amp; Sand Car Dealer</td>
<td>St. Croix</td>
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<tr>
<td>032C</td>
<td>12/31/2004</td>
<td>Tropical Cars of St. Croix, Inc.</td>
<td>St. Croix</td>
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<tr>
<td>009C</td>
<td>12/30/2004</td>
<td>Western Auto (STX) *</td>
<td>St. Croix</td>
</tr>
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<td>011CX</td>
<td>12/31/2003</td>
<td>Cruzan Environmental Services</td>
<td>St. Croix</td>
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<td>007C</td>
<td>12/31/2003</td>
<td>Public Works (Concordia)</td>
<td>St. Croix</td>
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<tr>
<td>036C</td>
<td>12/31/2003</td>
<td>St. Croix Radiator</td>
<td>St. Croix</td>
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</table>
3. Hazardous Waste Program

The Virgin Islands implements its own hazardous waste program independent of the US Environmental Protection Agency. All facilities which generate, store, transport and or collect hazardous waste must meet the Territory’s requirements except where federal requirements are more stringent or broader in scope.

The Virgin Islands has not adopted the Universal Waste Rule. As such, no waste may be managed as universal waste. Rather, all hazardous waste in the Virgin Islands must be managed under traditional hazardous waste requirements based on total monthly waste.

Any person engaged in the generation, storage, transportation, treatment, disposal or recovery of hazardous waste shall obtain a permit thereof form the Department of Planning and Natural Resources. Permit must be renewed annually.

<table>
<thead>
<tr>
<th>Permit Number</th>
<th>Facility Name</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-043</td>
<td>Kmart</td>
<td>9000 Lockhart Garden, St. Thomas</td>
</tr>
<tr>
<td>C-042</td>
<td>Kmart</td>
<td>Remainder Matriculate, St. Croix</td>
</tr>
<tr>
<td>T-041</td>
<td>Kmart</td>
<td>26-A Tutu Park Mall, St. Thomas</td>
</tr>
<tr>
<td>C-036</td>
<td>O’Neale Trucking</td>
<td>Wilfred Allick, St. Croix</td>
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<tr>
<td>C-038T</td>
<td>O’Neale Trucking</td>
<td>Wilfred Allick, St. Croix</td>
</tr>
<tr>
<td>C-069</td>
<td>Seaborne Airlines</td>
<td>St. Croix</td>
</tr>
<tr>
<td>C-191</td>
<td>VIPA</td>
<td>Rohlsen, St. Coix</td>
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<tr>
<td>C-023</td>
<td>Toyota</td>
<td>#1 Estate Body Slob, St. Croix</td>
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<tr>
<td>C-057</td>
<td>Adcon Environmental</td>
<td>Fort Louise Augusta Restrooms</td>
</tr>
<tr>
<td>C-063</td>
<td>VI Salvage d/b/a 180 Auto</td>
<td>236 Estate Glynn, St. Croix</td>
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<tr>
<td>C-024</td>
<td>Bunkers Of St. Croix</td>
<td>27 Castle Coakley, St. Croix</td>
</tr>
<tr>
<td>C-022</td>
<td>Caribbean Auto Mart</td>
<td>13 Glynn, St. Croix</td>
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<tr>
<td>T-028</td>
<td>FAA</td>
<td>Cyril E. King Airport, St. Thomas</td>
</tr>
<tr>
<td>C-025</td>
<td>FAA</td>
<td>#10 Estate White Lady, St. Croix</td>
</tr>
<tr>
<td>C-061</td>
<td>JFL Hospital</td>
<td>Estate Diamond, St. Croix</td>
</tr>
<tr>
<td>T-054</td>
<td>VIHA-Tutu Apartments</td>
<td>#387 Anna’s Retreat, St. Thomas</td>
</tr>
<tr>
<td>C-041</td>
<td>VIHA-Paradise</td>
<td>Paradise, St. Croix</td>
</tr>
<tr>
<td>T-051</td>
<td>VI Army National Guard</td>
<td>Estate Nazareth, St. Thomas</td>
</tr>
<tr>
<td>C-052</td>
<td>VI Army National Guard</td>
<td>Estate Manning, St. Croix</td>
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<tr>
<td>C-002T</td>
<td>O’Neale’s Trucking</td>
<td>Wilfred Allick, St. Croix</td>
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<tr>
<td>C-001T</td>
<td>VI Regulated Waste Mgt</td>
<td>Wilfred Allick, St. Croix</td>
</tr>
</tbody>
</table>
4. Brownfields Program

A brownfield is a property of which the expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. It is estimated that there are more than 450,000 brownfields in the United States.

Cleaning up and reinvesting in brownfield properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment.

In 2009 DPNR conducted nine Phase I Environmental Site Assessments for properties located throughout the Territory. The purpose of these environmental assessments was to describe current site conditions and to establish if there was evidence that a release of oil or hazardous materials had occurred at the site or that a threat of release exists. Such a release could represent a liability to the property owner or operator.

<p>| C-037 | VI Regulated Waste Mgt | Wilfred Allick, St. Croix |
| C-040T | VI Regulated Waste Mgt | Wilfred Allick, St. Croix |
| T-032 | FAA-Tower Control | St. Thomas |
| C-026 | FAA-Recovery | St. Croix |
| C-027 | FAA-ILS | St. Croix |
| T-031 | FAA-Radar Facility | St. Thomas |
| T-030 | FAA-Navigation Facility | St. Thomas |
| T-042 | VIHA-Bovoni Apartments | Bovoni, St. Thomas |
| C-044 | Managed Freight | Richmond, St. Croix |
| T-045 | Total Petroleum | St. Thomas |
| T-046 | RLS Hospital | Sugar Estate, St. Thomas |
| C-048 | Seabornie | St. Croix |
| C-049 | Hams Bluff Lighthouse | Hams Bluff, St. Croix |
| C-191 | TSA-Henry Rohlsen | St. Croix |
| T-053 | DOE-LAGA Building | Tutu-St. Thomas |
| C-055 | VI National Guard | Sprat Hall, St. Croix |
| C-056 | VI National Guard | Hams Bluff, St. Croix |
| T-140T | VI Regulated Waste | Contant, St. Thomas |
| C-062 | VI Rum | Diamond, St. Croix |
| C-066 | Buccaneer Hotel | St. Croix |
| C-067 | Bohlke International | Henry Rohlsen Airport, St. Croix |
| C-072 | Salt River Restoration | Salt River, St. Croix |
| T-021 | Heavy Materials, LLC. | St. Thomas |
| C-058 | Gallows Bay | Gallows Bay, St. Croix |
| C-059 | DOL-STX | Sunny Isles, St. Croix |
| T-060 | DOL-STT | St. Thomas |</p>
<table>
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<tr>
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<th>Location</th>
<th>Recommendation</th>
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<tr>
<td>15 &amp; 16 Prince Street &amp; 54 &amp; 55-B Hospital Street</td>
<td>Frederiksted, St. Croix</td>
<td>No further oil and/or hazardous materials assessments activities are necessary at this time</td>
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<td>6, 6-a &amp; 8 Penitentiary Land</td>
<td>Christiansted, St. Croix</td>
<td>Further assessment activities are necessary at the site. Phase II Assessment was recommended</td>
</tr>
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<td>No further oil and/or hazardous materials assessments activities are necessary at this time</td>
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<td>Sub Base, St. Thomas</td>
<td>Further assessment activities are necessary at the site.</td>
</tr>
<tr>
<td>24 &amp; 25 Sub Base</td>
<td>Sub Base, St. Thomas</td>
<td>Further assessment activities are necessary at the site.</td>
</tr>
<tr>
<td>72 Lindbergh Bay</td>
<td>Charlotte Amalie, St. Thomas</td>
<td>Further assessment activities are necessary at the site.</td>
</tr>
<tr>
<td>27 Strand Street</td>
<td>Christiansted, St. Croix</td>
<td>No further oil and/or hazardous materials assessments activities are necessary at this time</td>
</tr>
<tr>
<td>4 Wimmelskafte Gade, back Street</td>
<td>Charlotte Amalie, St. Croix</td>
<td>No further oil and/or hazardous materials assessments activities are necessary at this time</td>
</tr>
<tr>
<td>Oscar E. Henry Customs House</td>
<td>Frederiksted, St. Croix</td>
<td>No further oil and/or hazardous materials assessments activities are necessary at this time. However, mold assessment and abatement activities are necessary to eliminate health hazards</td>
</tr>
</tbody>
</table>

### F. Wetlands Programs

**BACKGROUND**
The quality of life in the Virgin Islands and the strength of the Virgin Islands economy depend heavily on maintaining and restoring the health of the nearshore coastal environment; including wetlands, mangroves, coral reefs, and seagrass beds; communities that form a tightly linked ecosystem connected through hydrology and runoff. For the past several decades, population growth has compounded the effects of poor land use practices. This is manifested in catastrophic runoff, sedimentation, nutrient enrichment from failed septic systems and pollutant contamination of coastal wetlands, waters, and bays. Various studies have associated land use in upland areas of watersheds are adversely affecting low-lying terrestrial and marine resources. Nevertheless, the extent of the impacts across the Territory is unknown, and a comprehensive assessment of the watersheds and wetlands of the VI is not presently complete. Additionally, the existing datasets maintained by public
institutions have not been made available in published documents or placed into a web-accessible database for resource managers and public use.

**PHASE I**
The first phase of the wetlands inventory project, titled, “The Virgin Islands Wetlands and Riparian Areas Inventory: A Pilot Study to Characterize Watersheds and Wetland Systems, Phase I”, was completed in 2004 by the Department of Planning and Natural Resources, in partnership with Island Resources Foundation (IRF) and the University of the Virgin Islands (UVI). Phase I of the project focused on a limited assessment of watershed/wetland ecosystems. Geographic Information System (GIS) technology was used to produce an inventory of watersheds and wetlands (type and location) throughout the U.S. Virgin Islands (USVI), produce GIS map products, and data for statistical and spatial analyses. Eighteen (18) priority watersheds (of the 50 in the USVI) were assessed and characterized using a matrix based on categorizing watersheds into three groups; (i) undisturbed, (ii) moderately disturbed, and (iii) highly disturbed watersheds. Vegetation characterization, water chemistry sampling, sedimentation history, and an Index of Biological Integrity assessment were completed within each selected watershed. The information and data gathered from the pilot study of Phase I were used by the project collaborating institutions to determine the proposed Scope of Work for Phase II of the project.

**PHASE II**
The “Virgin Islands Wetlands and Watersheds Characterization Phase II: Inventory, Monitoring, Assessment, Management, and Education in the U.S. Virgin Islands”, began in 2007 and was designed initially to complete the watershed/wetlands assessment for the Virgin Islands by compiling existing data from multiple projects and sources, filling data gaps, developing appropriate management strategies, and educating the public about the importance of wetlands and watersheds.

Phase II is scheduled for completion at the end of 2010. The major outputs of Phase II are:
2. Adoption of a definition of wetland for use in the USVI.
3. Maps showing the locations of wetlands in the USVI.
4. Conceptual framework for management of wetlands in the USVI.
5. Publication titled “Wetlands of the U.S. Virgin Islands”.

**TYPES OF WETLANDS**
Wetlands provide a range of goods and services that contribute to the economic and social development of the USVI. However, the various development activities result in significant degradation of the very resources that support the development of the USVI. In an effort to improve the development process, policies, laws, and initiatives have been developed to protect our natural resources. The primary purpose of the associated laws and programs is to ensure that development can be sustained and the quality of life can be maintained for current and future generations of Virgin Islanders. By definition, “Wetlands in the U.S. Virgin Islands generally include watercourses, marshes, swamps, artificial ponds and impoundment, salt ponds, lagoons, shallow seagrass beds, and other similar areas.”
Each type of wetland is formed under a specific set of conditions, and will typically have associated plants (flora) and animals (fauna).

**Type 1: Watercourses**
A watercourse is defined in the Virgin Islands Code as “… any stream with a reasonable well-defined channel, and includes streams which have a permanent flow, as well as those which result from the accumulation of water after rainfall and which regularly flow through channels formed by the force of the waters”

In the USVI, watercourses are commonly referred to as ghuts. These ghuts are the main drainage channels for discharge of runoff from rainfall events. In addition to that function, ghuts provide a range of goods and services that support the development processes of the USVI. Ghuts also contain permanent pools of freshwater, which function as habitats for rare species of aquatic animals (e.g. Mountain Mullet and American Eel). Ghuts take a range of shapes, sizes, and depths, depending on the terrain and the size of the watershed. The vegetation found inside ghuts also varies accordingly, but two distinct forest types have been associated with ghuts. These forest types are Gallery Moist Forest and Gallery Shrubland.

Ghuts of Interest are those that meet any one of the following criteria:
- Ghuts with permanent pools
- Ghuts currently used for recreational purposes
- Ghuts supporting other community uses
- Ghuts containing critical habitats
- Ghuts supporting endangered species of plants or animals
- Ghuts containing significant historic, archeological, or cultural resources
- Ghuts facing significant threats – e.g. dumping from construction activities or used for sewage disposal.

<table>
<thead>
<tr>
<th>St. Croix</th>
<th>St. John</th>
<th>St. Thomas</th>
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<tbody>
<tr>
<td>Adventure Stream</td>
<td>Battery Gut</td>
<td>Bonne Resolution (Dorothea) Gut</td>
</tr>
<tr>
<td>Bethlehem Gut</td>
<td>Fish Bay Gut</td>
<td>Caret Bay/Sorgenfri Ghut</td>
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<tr>
<td>Butler Bay Ghut</td>
<td>Guinea Gut</td>
<td>Contant Gut</td>
</tr>
<tr>
<td>Caledonia Gut</td>
<td>Johnny Horn Ghut</td>
<td>deJongh Gut</td>
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<tr>
<td>Canaan Ghut</td>
<td>Living (Reef Bay) Gut</td>
<td>Magens Bay Gut</td>
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<td>Cane Bay Ghut</td>
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<td>Creque Gut</td>
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<td>Fountain Ghut</td>
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<td>Jolly Hill Gut</td>
<td>Turpentine Run</td>
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<td>La Grange Gut</td>
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<td>Mahogany Gut</td>
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<tr>
<td>River Gut</td>
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</tbody>
</table>

**Type 2: Marshes**

A marsh is defined as “a water saturated, poorly drained area, intermittently or permanently water covered, having aquatic and grass-like vegetation” ([http://water.usgs.gov/water-basics_glossary.html](http://water.usgs.gov/water-basics_glossary.html)). Marshes in the USVI are typically fresh-water wetlands formed in depressions in the landscape, and maintained by surface or subsurface flow of water.

**Type 3: Swamps**

A swamp is defined as “an area intermittently or permanently covered with water, and having trees and shrubs” ([http://water.usgs.gov/water-basics_glossary.html](http://water.usgs.gov/water-basics_glossary.html)). In the USVI, swamps are generally located on the coast. Water level is determined mainly by surface runoff during the rainy season, but brackish conditions exist in areas of the swamp closest to the sea, or during the dry season. As a result of this salinity gradient, plants adapted to both fresh water and saline conditions may be found in some swamps. Example, Magens Bay swamp, St. Thomas.

**Type 4: Artificial Ponds and Impoundments**

“A pond is a body of standing water, either natural or man-made, that is usually smaller than a lake” ([http://en.wikipedia.org/wiki/Pond](http://en.wikipedia.org/wiki/Pond)). In the USVI, man-made (artificial) ponds are created primarily for provision of water for agricultural purposes. Increasingly, ponds are created for storm-water management purposes on sites with large developments or on sites that are periodically flooded. An impoundment is a body of water resulting from the placement of a stone dyke or earthen berm across a natural drainage channel (ghut). Impoundments were used in the early 1900s as part of the system of collection and distribution of potable water, particularly on St. Croix. Currently, impoundments are constructed and used mainly to provide water for agricultural purposes. Both ponds and impoundments provide habitats for a range of resident and migratory species of water birds.

**Type 5: Salt Ponds**

A salt pond is a coastal wetland that is separated from the sea by a low sandbank, sand dune, or similar feature. Salt ponds are formed over long periods by the accretion of reefs, growth of mangroves, or the accretion of sand along the mouth of an embayment. Once the pond is separated from the sea, water exchange between the two is primarily through the separating barrier. Depending on the size and structure of the salt pond, openings to the sea may be created during the rainy season if the pond collects significant amounts of surface runoff. The barrier may also be overtopped by the
sea during periods of significant wave action. Such wetlands are commonly called salt ponds because
the water in the ponds becomes hypersaline during the periods when the water level is low; that is, the
water becomes more saline than ordinary sea water. In some ponds, the salt can be seen as a
crystalline deposit along the edges of the pond or towards the landward portion (back) of the pond.

Salt ponds provide a habitat for many species of birds, but few plants are adapted to survive in such
hypersaline conditions. Plants typically found at salt ponds are Black Mangrove, White Mangrove,
and the shrubs Saltwort and Sea Purslane

Type 6 Lagoons

A lagoon is defined as “a stretch of salt water separated from the sea by a low sandbank, coral reef or
similar natural or manmade feature.” In the USVI, lagoons are typically formed by one of two
processes. One process involves wave action moving sand and gravel along the shoreline,
periodically closing the mouth of an embayment. Sandbars are sometimes breached by strong wave
action, particularly during storms. Sandbars/sandbanks often become colonized and stabilized by
plants, which can result in the closure becoming semi-permanent or permanent over time. The second
process involves the formation of a sandbar across the mouth of a seasonal stream (ghut). In such
cases, the sandbar is periodically breached by wave action or by surface runoff discharged through
the ghut after rainfall events. Lagoons can have very restricted access or narrow channels that permit
fairly consistent flows between the lagoon and the sea. Lagoons are ecologically productive sites,
providing habitats for a range of fish and bird species, including migratory species of birds. Examples
of lagoons are the Altona Lagoon (St. Croix) and Benner Bay/Mangrove Lagoon (St. Thomas).

Type 7: Seagrass beds

Seagrass beds are ecosystems dominated by marine grasses. Seagrass beds typically inhabit shallow
nearshore areas, but can be found in a range of depths from shallow lagoons to open coastal areas 60
feet in depth. There are 40-50 species of seagrasses world-wide, and most are found in the tropics.
Though seagrass beds are dominated by seagrasses, the communities contain many species of algae.
Seagrass beds function as important nursery areas for a wide variety of marine organisms (including
important food species). Seagrass beds also function to colonize open areas, and their root systems
help to stabilize unconsolidated soils

PRIORITY FOR MANAGEMENT OF WETLANDS

The major issues and priorities currently relevant to wetlands are:

1. Integration of the Policy Framework
There are several laws relevant to the management of wetlands, and those laws are administered by
several agencies. The programs managed by the various agencies are usually in line with national
priorities. In 2009, the Department of Planning and Natural Resources initiated activities to develop a
Wetlands Management Program. That program will establish a mechanism for integration of the
wetlands-related policies and programs of the public agencies in the U.S. Virgin Islands, including
the involvement of community organizations
2. Reduction of Threats

There are significant threats to wetlands and associated resources from natural and man-made sources. The man-made threats are primarily from land use activities (e.g. changed drainage, sediment from construction activities, filling of wetlands, disposal of solid waste and effluents), but also from illegal practices (e.g. solid waste disposal). These threats reduce the benefits provided by wetlands. While threat reduction is a priority of the management agencies, the most important require changes in attitudes and practices of individuals in the community.

3. Storm Water Management

Due to the topography of the islands, most development activities (including residential development) involve the channeling of surface runoff from rainfall events. Poor storm-water management practices result in damage to wetlands, social infrastructure (e.g. roads), and private property. Individuals and companies undertaking developments must therefore use best practices in the design of stormwater management systems.

4. Future Demand for Goods and Services from Wetlands

The existing uses of wetlands are expected to continue. There is increased use for recreation, including eco-tourism ventures. With increased development activity, particularly larger resort projects, there is increased use of wetlands for storm-water management. It is forecasted that global warming will increase rainfall variability and intensity. As such, wetlands will play an even greater role in flood protection.

5. Information Management

In order to make informed decisions concerning the management of wetland resources, the regulatory agencies are constantly updating the databases on physical conditions and status of the resources. The community should become engaged in the management process, especially by sharing information on the use of wetlands and associated resources, and threats to such resources.

FRAMEWORK FOR MANAGEMENT OF WETLANDS IN THE USVI

Rationale for Development of a Wetlands Management Framework

Wetlands in the U.S. Virgin Islands (USVI) provide a range of goods and services that support the social and economic development of the Territory. Due to the range of benefits provided by wetlands, as well as their distribution across the topographic landscape, wetlands fall within the area of responsibility of several Territorial and U.S. Federal agencies. As such, wetlands form critical components of several programs designed to maintain the economic growth of the USVI and quality of life of its residents. Environment and development programs in which wetlands play a critical role include:

(a) Agriculture Development – Impoundments were established to collect water for agricultural uses. The 1979 report on the USVI Sediment Reduction Program noted that there were 278 impoundments in the USVI in 1979 (BC&E/CH2M Hill, 1979).

(b) Reduction in Non-Point Source Pollution – The 1979 Sediment Reduction Program was designed around the functioning of impoundments as sediment traps. The existing Earth Change Permit
process was similarly designed to reduce soil erosion and sedimentation of waterways, and
development activities affecting ghuts are regulated within this process.

(c) Coastal Zone Management – Wetlands form one of the nine (9) Enhancement Areas for the USVI
Coastal Zone Management Program, as required by Section 309 of the Coastal Zone Management
Act, 1972.

(d) Wildlife Management – Wetlands function as important habitats for a range of wildlife species,
and associated management interventions range from periodic resource assessments to designation
and management of wildlife reserves by both Territorial and Federal agencies.

(e) Water Resources Management – Surface water forms one of the components of waters of the
USVI as defined by the V.I. Code. While there is no water resource management program, the non-
point source pollution program was developed to protect the quality of the waters of the USVI for a
range of social and ecological purposes.

(f) Flood Control – Storm-water management in development activities and general flood control are
managed by two separate agencies of the Government of the USVI (Department of Public Works and
Department of Planning and Natural Resources).

(g) Waste Management – Wetlands are used as part of the waste disposal strategy in the USVI, in
that; a number of municipal sewage treatment plants discharge effluent directly to ghuts. Discharge of
untreated sewage to wetlands also takes place when there is equipment failure. Additionally, the two
municipal landfills are located in wetlands.

Despite the above program imperatives that involve wetlands, there is no wetlands program in the
USVI. Attempts to establish a wetlands program include the 2006 draft wetlands conservation plan
prepared by the Division of Fish and Wildlife and the current attempt by the Division of
Environmental Protection. However, a wetlands program designed for a single agency to fulfill its
mission objectives will not accommodate the afore-mentioned range of program needs. This is
particularly true as a number of the uses of wetlands are conflicting across the various programs.
What is needed is a unified approach that supports multiple policies and program objectives, and that
prevents program conflicts. This unified approach to wetlands management is hereby termed the
“Wetlands Management Framework for the U.S. Virgin Islands”.

The purpose of the Wetlands Management Framework is to ensure that all management interventions
for wetlands in the U.S. Virgin Islands are designed based on a single policy and strategy and that
institutional arrangements are establish to minimize waste and conflicts while maximizing the
impacts of each management intervention.

**Current Wetlands Management Framework**

There is a variety of laws that provide the foundation for a wetland management framework, and
there are both Federal and Territorial agencies that are involved in programs and initiatives affecting
wetlands. Though there is this range of institutions and programming that affect wetlands in one way
or another, the focus on wetlands appear to be tangential at best. Programs and resource management
strategies that should have wetlands management as a central feature have either been inexplicably terminated (Sediment Reduction Program), inconsistent in application (Areas of Particular Concern), relegated wetlands to a low level of priority (Coastal Zone Management Program), or treat wetlands as tangential (Water Pollution Control Program and 2005 Comprehensive Wildlife Conservation Strategy for the USVI). The single attempt to develop a wetlands conservation plan (Platenberg, 2006) focused on one district, and has been approved or implemented. Wetlands are not specifically mentioned in the priority goals or objectives identified in the 2010 USVI Coral Reef Management Program. However, two of the four priority sites (St. Thomas East End Reserve and St. Croix East End Marine Park) include large areas of wetlands).

The absence of policies and guidelines for wetlands management inhibit the development or integration of relevant programs. The 2009 Section 309 Assessment for the USVI Coastal Zone Management Program states that policies to increase protections for wetlands were approved by the Coastal Zone Management Commission in 2006, but now needs to be promulgated and adopted as rules and regulations within the coastal zone management program. Similarly, there is no institutional arrangement that supports information sharing and collaborative programming, both necessary to ensure the development of synergies between the various programs.

**Trends and Major Issues Currently Relevant to Wetlands**

The trends that have been identified are:

(a) **Reduction in Acreage of Wetlands in the U.S. Virgin Islands** – Damage to wetlands and loss of acreage has been chronicled in several reports (Sladen 1986, Stengel 1998). The major activity contributing to loss of wetlands is (past and current) development activity, primarily industrial, resort, and marina development. The continued generation of a range of other threats to wetlands and associated resources (Gardner et al, 2008) remain a cause of concern.

(b) **Continued Provision of Goods and Services** – Wetlands continue to provide a range of goods and services (Virgin Islands Department of Agriculture 1973, Smith 1989, Kelsey et al 2005, Rennis et al 2006, Gardner et al 2008, Valiulis 2009). In addition to the provision of water and food, the environmental services provided by wetlands include wildlife habitats, water purification, groundwater recharge, flood reduction, and storm protection.

(c) **Contribution to Economic Development** – Wetlands have played a significant role in the economic development of the U.S. Virgin Islands (Gardner et al, 2008) through the provision of water for domestic, agricultural, and industrial purposes. Current direct contributions include provision of recreational opportunities, educational opportunities, and water for agriculture.

The major issues and priorities are:

(a) **Need for an Integrated Policy Framework** – There are several laws relevant to the management of wetlands, and those laws are administered by different agencies. Though the programs managed by the various agencies are usually in line with national priorities, there is a need to establish a mechanism for integration of the wetlands-related policies and programs of the public agencies in the U.S. Virgin Islands, including the involvement of non-governmental organizations.
(b) **Existence of Significant Threats** – There are significant threats to wetlands and associated resources from natural and man-made sources. The man-made threats are primarily from land use activities (e.g. changed drainage, sediment from construction activities, filling of wetlands, disposal of solid waste and effluents), but also from illegal practices (e.g. solid waste disposal). These threats reduce the benefits provided by wetlands. While threat reduction is a priority of the management agencies, success of management interventions require changes in attitudes and practices of individuals and institutions in the community.

(c) **Need for Improved Storm Water Management** – Due to the topography of the islands, most development activities (including residential development) involves the channeling of surface runoff from rainfall events. Poor storm-water management practices result in damage to wetlands, social infrastructure (e.g. roads), and private property. Individuals and companies undertaking developments must therefore use best practices in the design of storm-water management systems.

(d) **Future Demand for Goods and Services from Wetlands** – The existing uses of wetlands are expected to continue. There is increased use for recreation, including ecotourism ventures. With increased development activity, particularly larger resort projects, there is increased use of wetlands for storm-water management. It is forecasted that global warming will increase rainfall variability and intensity. As such, wetlands will play an even greater role in flood protection.

(e) **Need for Improved Information Management** – There is no structured program for research and monitoring of wetland resources. As such, data collection is sporadic, ad hoc, and not necessarily linked to institutional mandates or programs. Data and information is consistently lost. Additionally, databases compiled by Federal agencies are not utilized by USVI regulatory agencies for management decision making. In order to improve decision making in the development planning and development control processes, the environmental management agencies need to develop an overall data management strategy. That strategy should ensure compatibility of data collection regimes and data management systems, as well as establishment of data sharing mechanisms. The civil society institutions engaged in wetland initiatives should also be brought into the information management process.

Other issues requiring attention are:

(a) **Community Perception of the Value of Wetlands** – The continuing threats to wetlands and associated resources indicate that there is a general perception in the USVI that wetlands are not important. However, the conflicts that sometimes arise during public hearings for development projects often focus on environmental issues, including potential impact on wetlands. This contradiction suggests that there is no consensus in the community regarding the value of wetlands. This issue should be addressed in order to reduce conflicts within the development control process, and enable the regulatory agencies and community to make informed decisions regarding tradeoffs in the development process.

(b) **Climate Change associated with Global Warming** – Climate change scenarios for the Caribbean suggest that sea level rise will be approximately 1.5 feet over the next century. This will result in inundation of some coastal areas, increasing acreage under wetlands, but also impacting negatively on
social infrastructure and some major resources (e.g. aquifers). More immediately, increased intensity of storms and changing rainfall patterns are expected to create significant impacts on ecosystems, including wetlands. A comprehensive monitoring program should be established to support informed resource management decision making, particularly for critical or fragile ecosystems.

PROPOSED WETLANDS MANAGEMENT FRAMEWORK

The Wetlands Wise Use Project of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) identifies the elements of an effective wetlands management program as:

• Appropriate Policy Framework;
• Appropriate Legal Framework;
• Appropriate Institutional Framework;
• Management Strategy;
• Management Plan/Action Plan; and
• Institutional Program/Annual Plan.

Appropriate Policy Framework

The development of an appropriate policy framework is best guided by an environmental ethic, which provides the broad philosophical basis and guiding principles for policy and program development. The guidelines prepared by the Ramsar Secretariat on the wise use of wetlands (Davis, 1993) identify the following as principal elements of a national wetland policy:

A. Improvement of institutional arrangements so that wetland policies can be fully integrated into the planning process; and the establishment of mechanisms and procedures for incorporating this integrated, multi-disciplinary approach into planning and execution of projects concerning wetlands.

B. Review of existing legislation and government policies (including subsidies and incentives) including, where appropriate, application of existing legislation and policies, adoption of new ones, and use of development funds for wetlands.

C. Increasing knowledge and awareness of wetlands and their values, including exchange of information, propagation of their benefits and values (a statement of which is given), review of traditional techniques, and training of appropriate staff.

D. Review of the status of wetlands in the national context, including compilation of a national inventory, and definition of each wetland's particular values and conservation priorities.

E. Addressing of problems at particular wetland sites, by integrating environmental considerations into their management, regulated utilization, establishment of management plans, designation as appropriate for the Ramsar List, establishment of nature reserves and, if necessary, restoration.

Appropriate Legal Framework
The legal framework supports not only the development of regulations, but also provides an underpinning for the establishment of creative and evolving management and compliance strategies. Elements of an effective legal framework include:

A. A framework law that addresses wetland as a specific ecosystem requiring directed management intervention, that links the primary enabling legislation to other relevant legal instruments directed at other programs and development processes.

B. Subsidiary legislation that facilitate the development of an effective institutional framework.

C. Guidance and guidelines to support the use of a wide range of measures and instruments (regulatory, fiscal, and non-fiscal) to enable effective management interventions.

**Appropriate Institutional Framework**

Although one public sector institution will be given the responsibility of being the lead agency for coordination of a territorial program, effective management will include collaborative arrangements between several public, private, and civil society institutions. An appropriate institutional framework will address the following:

A. Collaborative programming, to assist in resolving conflicts, assist in making decisions relating to trade-offs, clarify roles and responsibilities of different stakeholders, and facilitate diverse stakeholder involvement.

B. Development of an institutional coordinating mechanism that facilitates harmonization of management arrangements and institutional cultures (planning and decision-making systems, legal requirements in the various regulatory processes, reporting requirements and mechanisms, etc.).

C. Shared information collection and management systems.

**Management Strategy**

The territorial management strategy is meant to provide strategic focus, translating the policy framework into strategic directions for wetlands management over an agreed period. The territorial strategy should:

A. Provide a structured framework for wetlands management, establishing the goals and objectives of the territorial program, and establishing guidelines and practices that link site management interventions to system management goals and objectives.

B. Facilitate integration with other relevant planning strategies, such as those for tourism, biodiversity conservation, and protected areas.
C. Facilitate integration with the economic development strategies and development control processes.

D. Provide guidance on the design and implementation of a public engagement strategy.

E. Provide a structured approach for coordinating the initiatives of the various institutions implementing wetlands-related activities.

F. Provide a broader perspective for addressing site-specific issues.

**Management Plan/Action Plan**

The wetlands management plan is the action plan for the strategy period, and should:

A. Identify priority interventions for the strategy period, setting targets and identifying milestones.

B. Assign institutional roles within each area of intervention.

C. Establish coordinating mechanisms and structures.

D. Identify resource requirements.

E. Establish monitoring and evaluation guidelines and procedures for the implementation of the management plan/action plan

**Institutional Program/Annual Plan**

Each institution with assigned roles in the management plan/action plan should establish an institutional plan designed to:

A. Fulfill the institution’s obligations identified in the Wetlands Strategy and Management Plan.

B. Be responsive to the institution’s legal mandate.

**IMPLEMENTATION AGENDA**

If the above program elements are used as the guide for the development of a wetlands management program for the USVI, the process of development of an appropriate wetland policy will take a minimum of five (5) years. As such, establishment of some elements will proceed apace, rather than wait on the completion of the policy process. The following actions are proposed as the initial steps in the development of the wetlands management framework for the USVI:

1. Preparation of a Draft Wetlands Policy.
3. Design of inter-agency management structure and preparation of associated collaborative agreement.
4. Preparation of institutional work plans.
5. Development of data management policies and data management mechanisms.
6. Establishment of framework management support systems (planning, communications, etc.).
7. Establishment and testing of data management system.
9. Preparation of a 5-year work plan.
10. Preparation of program financing strategy and plan.
11. Convene workshop (finalize report and work plan).

G. Water Quality Management Planning Program

The Water Quality Management Planning (WQMP) Program was created in 2000. Under the WQMP Grant (pursuant to CWA §604(b)), the V.I. DPNR-DEP is entrusted with the task of planning and implementing Water Quality Management Projects to ensure the protection of the marine waters of the USVI. Several duties that were formerly under the auspices of the Water Pollution Control (WPC) Program were placed under the WQMP. In FY2009, WQMP was merged with WPC, as such the 2010 Integrated Report was drafted by the newly segmented Water Quality Management Program (WQM).

The Storage and Retrieval of Water-Related Data (StoRet) program is managed and updated by WQM staff. The monitoring data is uploaded to StoRet via the Water Quality Exchange Web Template.

The Assessment Database (ADB) was fully implemented once the Virgin Islands defined assessment units for more comprehensive water quality assessments. ADB is a valuable tool for storing assessment information and retrieving it for reporting purposes. Research Triangle Institute released ADB version 2 for 2002. The data stored in ADB v.2 is more accurate thanks to the VI Standard Waterbody Delineation project. The VI has been steadily upgrading ADB v.2 as necessary. The most current version of ADB is ADB v2.2

H. Coral Reef Monitoring

A number of agencies, including the United States Virgin Islands Government, have done sparse monitoring of coral reefs in the waters of the Virgin Islands for some time. In November and December 2007, EPA-ORD’s OSV BOLD conducted a coral reef survey around St. Croix. The primary goal of the ORD’s survey was to evaluate health condition of the coral reefs at 60 predetermined sites, in order to determine if there is a correlation between nutrient and TSS data and the health condition of the coral reefs. RARE Project Monitoring was also conducted during 3rd Quarter Ambient Monitoring FY2009 in STT/STJ District on July 8-19, 2009.

In an effort to stay abreast of the territory-wide coral reef monitoring efforts WPC staff attended the NOAA CREIOS Workshop in San Juan, Puerto Rico on May 13-14, 2009.
I. Other Non-Point Source Activities

1. Education Outreach/Non-point Source Newsletter

In order to increase the awareness of non point source pollution among school children, presentations were made reaching a majority of students. University of the Virgin Islands staff working with VI Education Department staff developed presentations on non-point source pollution and ways to prevent it. DPNR-DEP will continue to guide the activities of the NPS Committee to address NPS issues in the Territory and participate in various educational and environmental events to promote NPS awareness within the community and schools.

2. Public information dissemination/outreach

The Division of Environmental Protection added an Environmental Education and Outreach program during this cycle. The Environmental Education program has since been involved in numerous outreach projects (in most cases in conjunction with other DEP programs) including: used oil drives, elementary and high school presentations, environmental public service announcements, and the Non Point Source Conference. DEP has also been actively utilizing their website located at http://www.dpnr.gov.vi in order to disseminate information to the public, solicit comments on public documents, and inform the public of happenings within the Division.

Funded by Section 319 grant money, the quarterly publication of the Non-point Source Newsletter has been continuously published since December 1997. Its purpose is to educate and inform the public about the programs of the Non-point Source Committee and to increase the awareness of the different aspects of non-point source pollution. The newsletter was published regularly throughout this reporting period.

3. 9th Annual NPS Conference

The 9th Annual Non Point Source Conference was held on November 28-30, 2005 at the Westin St. John Resort and Villas. The conference brought together individuals involved in pollution prevention, resource conservation, research, and economic development in the Virgin Islands to examine environmental issues in the territory and throughout the Caribbean. Community groups, farmers, government personnel, members of the construction and boating industries, non-governmental organizations, researchers, students and vendors were all invited to participate.

III. SURFACE WATER MONITORING & ASSESSMENT

A. Surface Water Monitoring Program

DPNR-DEP work plans require quarterly monitoring of seventy-seven (67) stations around St. Croix, sixty-eight (68) stations around St. Thomas, and eighteen (18) around St. John. These sites are located offshore and are sampled by WPC staff using a vessel. DPNR-DEP expanded the monitoring network to include deep-water offshore sites at the outer rim of the USVI’s three-mile boundary. Some sites in the St. John network were abandoned in this reporting cycle due to their location within the jurisdiction of expanded federal waters of national parks and monuments.
### 1. Monitoring Sites

Table III.A.1. Virgin Islands Ambient Monitoring Sites (153).

<table>
<thead>
<tr>
<th>Stations</th>
<th>Class</th>
<th>Location</th>
<th>Stations</th>
<th>Class</th>
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<td>STC-1</td>
<td>B</td>
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<td>STC-27</td>
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<td>B</td>
<td>St. Croix Yacht Club Beach</td>
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<td>STC-11B</td>
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<td>Robin Bay</td>
<td>STC-36</td>
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<td>Manchenil Bay</td>
<td>STC-37</td>
<td>B</td>
<td>Christiansted Harbor Entrance West</td>
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<td>B</td>
<td>Halfpenny Backreef</td>
<td>STC-38</td>
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### St. Thomas 68 Sites

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### St. John 18 Sites

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</table>

2. Monitoring Measurements

At each station, field measurements are made of the following:
**Turbidity:** expressed in Nephelometric Turbidity Units (NTU’s) measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) using an EPA approved field instrument.

**Dissolved Oxygen:** expressed in mg/l saturation and measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

**pH:** expressed in **Standard Units (SU)** measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

**Temperature:** expressed in degrees Centigrade measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

**Salinity:** expressed in parts per thousand and measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)).

**Secchi Depth:** expressed in meters by a secchi depth recording light transparency.

**Bacteria:** Water samples are collected by surface grab sample at each station on a quarterly basis and taken to a DPNR certified laboratory where they are analyzed for **Fecal Coliform and Enterococci bacteria.** Results are expressed as number of colonies per 100 milliliters. Analysis is performed utilizing an EPA approved methodology. The geometric mean is also factored in before it is determined that an assessment does not meet the water quality standard.

**Total Suspended Solids:** Water samples are collected by surface grab sample at each station on an annual basis and taken to a DPNR certified laboratory where they are analyzed utilizing an EPA approved methodology.

**Total Phosphorous / Total Kjeldhal Nitrogen:** Water samples are collected by surface grab samples at each station on an annual basis and taken to a DPNR certified laboratory where they are analyzed utilizing an EPA approved methodology. DPNR-DEP is working to increase the sampling frequency for these parameters. A lack of resources, to include scheduling conflicts with the local lab, has resulted in limited sampling. Currently, the local lab is being checked for quality assurance issues and the efficiency of the methods used is also being evaluated. Once these issues are assessed, it is anticipated that the monitoring frequency will be increased.

3. 2008 and 2009 Monitoring Frequency

During this reporting period Ambient Monitoring was conducted for 3 quarters for FY2008 and once each quarter for FY2009. DPNR-DEP also conducted BEACH sampling on a weekly basis.
Figure III.A.1 St. Croix Water Quality Monitoring Network

Figure III.A.2 St. Thomas/St. John Water Quality Monitoring Network
4. Toxics/biological monitoring

No monitoring for toxics or biological effects is conducted in the Virgin Islands for lack of baseline standards for Virgin Islands conditions. According to the Virgin Islands multi-year monitoring strategy, DPNR will explore options for implementing a biological component of the Ambient Monitoring Program. This may include developing a partnership with NOAA or another agency with similar monitoring objectives.

5. Fish tissue, sediment, shellfish monitoring:

The Virgin Islands Water Pollution Control program does not include toxic chemicals or biological monitoring. The program also does not monitor fish tissue, sediment or shellfish for toxicity. A background analysis of ambient water quality has not yet been performed to support the adoption of criteria for toxic chemicals (1996 VI 305(b)).

6. Quality assurance/quality control program

The US Virgin Islands DPNR-DEP Quality Assurance (QA) Program is committed to assuring and improving the quality of all environmental measurements performed by and for the Department. The goal of the QA program is for the acquisition of reliable and defensible environmental data. It is the policy of DPNR that adequate QA activities are conducted within the agency to ensure that all environmental data generated and processed be scientifically valid, of known precision and accuracy, of acceptable completeness, representative, comparability and where appropriate, legally defensible. During Fiscal Years 2008 and 2009 QA activities such as program technical audits, file audits, revision of the Quality Assurance Management Plan, Management System Reviews, review of program and contractual Quality Assurance Project Plans, review of all program Standard Operating Procedures, and Laboratory Certifications were performed. DPNR has a full-time QA/QC Officer who also acts the Laboratory Certification Officer for the Department.

7. Volunteer monitoring

DPNR had no monitoring volunteers during the reporting period. Volunteer monitoring, however, is being planned for implementation in future water quality monitoring program activities.

8. Program evaluation

- A background analysis of ambient water quality is needed to support the adoption of specific criteria for toxic pollutants (1998 305(b) Report). As part of the 2004 US Virgin Islands Water Quality Standards revision, the national recommended criteria were adopted;

- New equipment and staff training is needed to assess water quality for the development of toxic and biological criteria (1998 305(b) Report);

- Revisions of the existing Local Water Pollution Control Act and regulation are needed to enhance the program’s ability to enforce its laws and statutes;
• Revisions to the Water Quality Standards and criteria to include numeric values instead of narrative description of desired water quality;

• Stormwater regulations are being implemented within the TPDES permitting program.

B. Assessment Methodology

Purpose:

The Clean Water Act requires each state, territory and tribe 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 report incorporates physical, chemical, and microbiological data from the StoRet database, habitat assessments, and beach monitoring data (fish kills/advisories, oil spills, beach closings, etc.). Use of data is subject to availability.

The U.S. Environmental Protection Agency encourages states, territories and tribes 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 uses this format to more accurately and completely assess our waterbodies.

Complete assessments include:

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. "Waters" of the U.S. Virgin Islands shall be defined, as follows, as in by Title 12, Chapter 7, Section 182(f) of the Virgin Islands Code; 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. These “waters” are included in the U.S. Virgin Islands 2010 Integrated Report. All available groundwater data will be reviewed for possible inclusion in the report and Division of Environmental Protection’s Groundwater Program will provide groundwater discussion in the 2010 Integrated Report. At the very least, the Integrated Report should include an overview of groundwater and wetlands resources.

Identification of waterbody classification and designated use.

According to the US Virgin Islands water quality standards, the waters of the Virgin Islands exist in one of three classes: A, B and C. The following describes the geographical extent of the three waterbody classes, the associated designated uses, and the applicable water quality standards.

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.

**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.

(1) Within 0.5 miles of the boundaries of Buck Island’s Natural Barrier Reef, St. Croix.

**Figure III.A.3 Class A - Buck Island, St. Croix**
(2) Trunk Bay, St. John.

**Figure III.A.4 Class A - Trunk Bay, St. John**

**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.

Figure III.A.5 Class B - St. Croix (only marine waters displayed)
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.

(1) St. Thomas:
   (A) St. Thomas Harbor beginning at Rupert Rock and extending to Haulover Cut.
   (B) Crown Bay enclosed by a line from Hassel Island at Haulover Cut to Regis Point at West Gregerie Channel.
   (C) Krum Bay.
(2) St. Croix:
   (A) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.
Figure III.A.8  Class C - Christiansted Harbor, St. Croix

(B) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.
Figure III.A.9  Class C - Frederiksted Harbor, St. Croix

(C) Hess Oil Virgin Islands Harbor (alternatively named HOVENSA Harbor).
(D) Martin-Marietta Alumina Harbor (alternatively named Port Alucroix or St. Croix Renaissance Group Harbor).
Figure III.A.10 Class C - HOVENSA Harbor and St. Croix Renaissance Group Harbor,

(3) St. John:
   (A) Enighed Pond Bay
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.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Class B</th>
<th>Class C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissolved Oxygen</td>
<td>Not less than 5.5 mg/l from other than natural conditions</td>
<td>Not less than 5.0 mg/l from other than natural conditions</td>
</tr>
<tr>
<td>pH</td>
<td>&lt;8.3 Tolerable Limit &gt;7.0</td>
<td>&lt;8.5 Tolerable Limit &gt;6.7</td>
</tr>
<tr>
<td>Temperature</td>
<td>Not to exceed 32° Celsius at any time</td>
<td>Same as Class B</td>
</tr>
<tr>
<td>Bacteria</td>
<td>A geometric (log) mean of</td>
<td>A geometric (log) mean of 200</td>
</tr>
<tr>
<td>Parameter</td>
<td>Standard</td>
<td>Compliance</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>fecal coliforms per 100 ml</strong></td>
<td>70 by MF or MPN count.</td>
<td>fecal coliforms per 100 ml by MF or MPN count.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Chlorine</td>
<td>The 4-day average concentration of Chlorine shall not exceed 7.5 ug/l.</td>
<td>Same as Class B</td>
</tr>
<tr>
<td></td>
<td>The 1-hour average concentration of Chlorine shall not exceed 13 ug/l.</td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td>Not to exceed 50 ug/L for any coastal waters.</td>
<td>Same as Class B</td>
</tr>
<tr>
<td>Suspended, colloidal or settleable solids</td>
<td>None from waste water, which would cause deposition or be otherwise deleterious.</td>
<td>Same as Class B</td>
</tr>
<tr>
<td>Oil and Floating substances</td>
<td>No residue attributable to waste water. No visible film; no globules of grease</td>
<td>Same as Class B</td>
</tr>
<tr>
<td>Radioactivity</td>
<td><strong>Gross Beta:</strong> 1000 picocuries per liter, in the absence of Sr 90 and alpha emitters</td>
<td>Same as Class B</td>
</tr>
<tr>
<td></td>
<td><strong>Radium-226:</strong> 3 picocuries per liter</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Strontium-90:</strong> 10 picocuries per liter</td>
<td></td>
</tr>
<tr>
<td>Taste and Odor</td>
<td>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</td>
<td>Same as Class B</td>
</tr>
<tr>
<td>Color and Turbidity</td>
<td>• A secchi disc shall be visible at a minimum depth of one meter</td>
<td>Same as Class B, but no NTU standard in Rules and Regulations</td>
</tr>
<tr>
<td></td>
<td>• A maximum nephelometric turbidity unit reading of three (3) shall be permissible</td>
<td></td>
</tr>
</tbody>
</table>
Inventory of physical, chemical and microbiological data

StoRet data extracts from fiscal years 2008-2009 will be considered for the 2010 water quality assessment. The source of StoRet’s data is the result of the Division of Environmental Protection’s Ambient Monitoring Program. The Water Quality Management Planning Program (WQMP) manages this program. Through the Ambient Monitoring Program, ambient water quality is monitored on a quarterly basis. WQMP also manages the Beach Water Quality Monitoring Planning which monitors designated recreational beaches on a weekly basis.

The Assessment Database (ADB) will be a valuable tool in storing information regarding designated uses for waterbodies. ADB will also be useful in storing pollutant and stressor data pertinent to making accurate assessments. ADB will also store cause and source data.

Habitat assessment data inventory

The US Virgin Islands Division of Fish and Wildlife has been identified as a possible data source for habitat assessments. Data provided by Fish and Wildlife will be reviewed to determine possible use in the water quality assessment report.

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 affect water quality in the US Virgin Islands. This log will be reviewed for all incidents that could have had a negative impact on US Virgin Islands water quality.

Identify exceedences 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.

Use determination status

Use support determination is dependent upon the guidelines set by the United States Environmental Protection Agency’s “Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Report Contents”, “Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Supplement” and “2006 Integrated Water Quality Monitoring and Assessment Report Guidance”.

Data gaps and error control

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 will be discarded.
It is understood that the US Virgin Islands has a number of data gaps. These 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.

The Integrated Report describes US Virgin Islands data gaps. Potential data gaps include beach closure data, habitat assessment data, toxicity and toxicant data, wetland assessment data, and intermittent streams data. DPNR intends to work on developing a data document in the near future. Any data gaps that are identified will be included in the multi-year monitoring strategy for resolution.

**Natural Disasters**

Hurricane season in the US Virgin Islands lasts from June through November each year. As part of the Territory’s post hurricane Emergency Response Plan (ERP) the Water Pollution Control program conducts ambient beach monitoring at each of the beach monitoring stations until the water quality is determined to meet water quality standards.

There was no sampling this cycle related to natural disasters.

**Evaluation of Internal Data**

Due to issues with internal data collection, which included malfunctioning equipment, USEPA evaluated DPNR Basic Water Quality Monitoring Program data for FY2008 and 2009. USEPA determined there could be no reliance on any DO, pH, turbidity and temperature data reported from the field. Therefore, DPNR were required to use only the beach monitoring data, data received during the 2010 Integrated Report data solicitation process announced on October 16, 2009, and analytical data for bacteria, TSS, and turbidity to conduct assessments for the 2010 Integrated Report.

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. Once the data is determined to meet the required objectives 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. The precision of data is a measure of the reproducibility of the measurement when an analysis is repeated. The precision of selected chemical analyses will be examined by using standard solutions and comparison of duplicate analysis. Relative percent difference (RPD) will be calculated for field duplicate analysis to assess precision of field collection procedure. Laboratory precision will be determined by calculating RPD of results of “unknown” analysis and laboratory duplicate analysis. The following is the formula used for calculation of RPD:

\[
\text{RPD} = \frac{(C_1 - C_2)}{\frac{(C_1 + C_2)}{2}} \times 100
\]

**RPD** = Relative Percent Difference
\( C_1 = \text{Larger of two observed values} \)
\( C_2 = \text{Smaller of two observed values} \)

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

**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/documentated analytical methods will determine that the measurement data represent the conditions at the site, to the extent possible. It is well known that water flowing past a given location on land is constantly changing in response to inflow, tidal cycle, weather, etc. Sampling schedules will be designed with respect to frequency, locations and methodology in order to maximize representativeness, where possible and applicable.

Laboratory representative 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 basically 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.

**Data From Other Sources**

DPNR will consider data received up to one week prior to the submission of the draft 303(d) Total Maximum Daily Load List. All data received past the deadline 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 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.

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:

<table>
<thead>
<tr>
<th>Contact Name</th>
<th>Title</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kofi Boateng</td>
<td>Associate State Director</td>
<td>UVI-CES</td>
</tr>
<tr>
<td>Jeffrey Potent</td>
<td>-</td>
<td>USEPA Region 2</td>
</tr>
<tr>
<td>Rafe Boufon</td>
<td>-</td>
<td>National Park Service</td>
</tr>
<tr>
<td>Barbara S.P. Moore</td>
<td>Director</td>
<td>NOAA/National Undersea Research Program</td>
</tr>
<tr>
<td>Eric Hawk</td>
<td>Section 7 Coordinator</td>
<td>National Marine Fisheries Service</td>
</tr>
<tr>
<td>Richard Nemeth, Ph.D.</td>
<td>Director</td>
<td>UVI-CMES</td>
</tr>
<tr>
<td>Pedro Diaz</td>
<td>-</td>
<td>USGS/GSA Center</td>
</tr>
<tr>
<td>Edwin Muniz</td>
<td>Supervisor</td>
<td>USFW/PR Field Office</td>
</tr>
</tbody>
</table>

Once 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 FY2008 and 2009 reporting cycle.

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

**Monitored Waters**

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.

**Use Support Determination**

Waterbody delineations used for determining use support are derived from global information system (GIS) coverages. The Division of Environmental Protection is currently in the process of contracting professional services to develop a standard waterbody delineation based on a number of prevailing factors.
Presently, use support will be determined using the most current version of the US Virgin Islands water quality standards. Water quality standard revision was initiated in 2008. The revision is complete and has been adopted into the Virgin Islands Rules and Regulations as of June 2011.

**Ground Water Assessment**

**Ground Water Monitoring Program**

Specific groundwater monitoring tasks:
- Collect continuous ground-water level records at selected sites in the major well fields in the U.S. Virgin Islands; St. Croix, St. Thomas, and St. John.
- Conduct monthly measurement of ground water level at selected sites in the U.S. Virgin Islands.
- Collect meteorological data (instantaneous point measurements) at one consistent station at each island to document climatic variations and seasonal patterns and to consider long term trends.
- Collect ground-water samples once a year at selected well fields to monitor ground-water quality for possible effects of degradation (changes in water quality as measured since 1960) from saltwater encroachment. This includes testing for sulfates, anions, cations, alkalinity, and conductivity.

**Surface Water Assessment**

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 from at least one assessment type in each 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.

1. Primary Contact Recreation

**Microbiological Assessment**

The use support is based on single sample maximum allowable density of fecal coliforms, 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, and in class B and
C, water bodies should not exceed 70 or 200 colonies/100mL in a single sample. The percent of total violations is evaluated as follows:

1. Fully Supporting: None of the Samples exceed 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 70 or 200 colonies/100 mL in class B and C waters for fecal coliform and 104 colonies/100 mL for enterococci.

**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.

The Department of Planning and Natural Resources only issues administrative advisories. Beach closures would only be enforced for very serious threats to human health. DEP has implemented a Beaches Environmental Assessment and Coastal Health (BEACH) monitoring program that takes enterococci at select sites on a weekly basis. This data will be used in conjunction with data collected from the Ambient Monitoring Program.

**Toxicant Assessment (Human Health)**

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.

The conditions for use support are as follows:

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

2. Partially Supporting: No toxicants noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.

3. Not Supporting: Toxicants noted in many tests and occurs frequently.

**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.

3. Aquatic Life Use Support.

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

DEP received no habitat assessment data for the 2008-2009 reporting cycle.

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.

The conditions for use support are as follows:

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

2. Partially Supporting: No toxicity noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.

3. Not Supporting: Toxicity noted in many tests and occurs frequently.

**Conventional Assessment**

Significant violations are determined for conventional parameters. Conventional parameters are evaluated using the frequency of violations.

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; and
- pH.

*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 the next Triennial Review of the WQS.

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.

**Toxicant Assessment (Aquatic Life)**

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.
The conditions for use support are as follows:
1. Fully Supporting: No toxicants noted in either acute or chronic tests compared to controls or reference conditions.
2. Partially Supporting: No toxicants noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.
3. Not Supporting: Toxicants noted in many tests and occurs frequently.

**Biological Assessment**

Upon identifying a source of data to apply towards a biological assessment, the conditions for use support is 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 2008-2009 reporting cycle.

**Listing Rules**

This methodology groups assessments as follows:

<table>
<thead>
<tr>
<th>Primary Contact Recreation (PCR) Indicators</th>
<th>Aquatic Life Use Support (ALUS) Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microbiological Assessment</td>
<td>Habitat Assessment</td>
</tr>
<tr>
<td>Beach Closing Assessment</td>
<td>Toxicity Assessment</td>
</tr>
<tr>
<td>Toxicant Assessment (Human Health)</td>
<td>Conventional Assessment</td>
</tr>
<tr>
<td>Other Parameters</td>
<td>Toxicant Assessment (Aquatic Life)</td>
</tr>
<tr>
<td></td>
<td>Biological Assessment</td>
</tr>
</tbody>
</table>

**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 data is insufficient to determine support for the other use. In addition, there is no data to indicate that the uses are threatened under the US EPA definition of threatened. Waters with insufficient data will be scheduled for more extensive monitoring in the USVI’s multi-year monitoring schedule.

Category 3
The assessment unit is placed in this category if insufficient or no data is available to determine if water quality standards are attained and any designated uses are supported. The Virgin Islands considers insufficient data as anything less than four quarters of monitoring data. However, waters with less than four 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 four 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).

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, 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. Assessment units place into this category must show improvement by the next reporting cycle. If the impairment persists because of current conditions it will be moved into Category 5. If the assessment unit shows improvement since the last cycle it will be moved into either Category 1 or 2. If the data available is insufficient to make an assessment, the assessment unit will be moved to Category 3 (see Category 3 for more detail).

**Category 5**
The assessment unit is placed into this category if water quality standards are exceeded in which case a total maximum daily load must be established. Assessment units that are placed into Category 5 will be placed on the 2010 303(d) Total Maximum Daily Load List.

**De-listing**
As a result of the abovementioned data restrictions, DPNR did not de-list any Assessment Units during the 2008-2009 reporting cycle.

**C. Monitoring Strategy**

The Water Pollution Control Program develops the Division of Environmental Protection’s monitoring strategy. The current monitoring strategy addresses the integrated five categories and the assessment units delineated by Battelle (2003). The monitoring strategy is available for inclusion in this methodology and is attached as an appendix.

The Water Pollution Control Program developed the following Multi-Year Monitoring Strategy in which a monitoring plan was detailed for 9 years from the point of its creation:

**FY 2004 *****
Develop a comprehensive monitoring and assessment program
Documentation and mapping of the USVI wetlands
Database design
Analysis of all wetlands and riparian areas
Land ownership records
Review of Quality Assurance Project Plan for monitoring and data analysis
Establish monitoring priorities and targets
Definition of field survey protocols
Preliminary field data collection on water quality
Characterization of plant communities and plant species
DPNR training on data collection and GIS application
Training on Clean Water Act, Oil Pollution Act and SPCC Wetlands and Regulation
Develop mangrove restoration plan for Salt River
Reassessment of the 13 category I watersheds

**FY 2005***
Develop a comprehensive monitoring and assessment program
Documentation and mapping of the USVI wetlands
Database design
Review of Quality Assurance Project Plan for new monitoring and data analysis
Establish monitoring priorities and targets
Definition of field survey protocols
Preliminary field data collection on water quality
Characterization of plant communities and plant species
Characterization of aquatic life
Start mangrove restoration for Salt River
Develop Watershed Restoration Strategies for Salt River
Training on wetland mitigation and delineation
Training on watershed assessment
Develop Watershed Restoration Strategies for Salt River and Benner Bay
BASINS training

**FY 2006**
Implement a comprehensive monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Start mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

**FY 2007**
Implement a comprehensive monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

**FY 2008**
Implement a comprehensive monitoring and assessment program
Input data on the database
Aggregate wetlands by similar types of stressors
Input information from database on GIS
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Start mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

**FY 2009**
Review the wetlands monitoring and assessment program
Input data on the database
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Training on wetland restoration

**FY 2010**
Review the wetlands monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Test and evaluate standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Develop Great Pond Enhancement Plan

**FY 2011**
Make appropriate changes to the wetlands monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Review procedures for field data collection on water quality
Review procedures for data collection on biological assemblages
Present a complete assessment report on USVI wetlands health and water quality
Evaluate results from mangrove restoration project in Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Implement Great Pond enhancement plan

**FY 2012**
Continue with wetlands monitoring and assessment program
Input data on the database
Field data collection on water quality
Data collection on biological assemblages
Review of assessment report on USVI wetlands health and water quality
Establish a mangrove restoration plan for critical areas based on the Salt River experience
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Implement Great Pond enhancement plan

FY 2013
Prepare a management plan for the USVI wetlands
Establish regulations for USVI wetlands
Identify new areas for wetland restoration
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Implement Great Pond enhancement plan

Section 303(d) Waters
Section 303(d) of the Clean Water Act requires States and Territories to develop a list of impaired waters needing TMDLs every even-numbered calendar year. An impaired waterbody is one for which technology-based pollution controls are not stringent enough to attain or maintain compliance with applicable State and Territory water quality standards. In order for a water quality-limited waterbody to attain water quality standards, a TMDL must be developed and implemented specifically for that waterbody and pollutant(s) of concern. A TMDL is a quantitative assessment of the amount of pollution that a certain waterbody can assimilate while still meeting water quality standards.

On July 28, 2010 the Virgin Islands Department of Planning and Natural Resources released the 2010 TMDL list for public comment. The final list consists of 87 assessment units listed for a variety of impairments. The 2010 303(d) List of Impaired Waterbodies is attached to this report as an Attachment.

D. Estuary and Coastal Assessment

1. Designated Use Support Summary

Assessment of the Virgin Islands’ coastal waters is presented in (estimated) square miles of assessment unit boundaries. Some 650 square miles are assessed in this report. A summary of use support assessments for coastal waters is shown in Table III.C.1. The mileage presented is based on Global Information Systems (GIS) approximations.

Table III.C.1. Waterbodies, Segments, and Categories

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<th>AU ID</th>
<th>AU Name</th>
<th>AU Size (sq. mi.)</th>
<th>305(b) Category</th>
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</table>

2. Individual Use Support Summary

Assessment of the Virgin Islands’ coastal waters is presented in (estimated) square miles of assessment unit boundaries. Some 650 square miles are assessed in this report.
Several assessment units were not assessed this cycle because certain areas fall within the jurisdiction of the National Park Service (refer to Attachment 1: 2006 303(d) List of Impaired Waterbodies for
greater detail). While the current assessment unit structure does not match perfectly with the waters under federal jurisdiction, Figures III.C.2.c and III.C.2.d illustrates these particular areas.

Figure III.C.2.c St. John Assessment Units Completely Under Federal Jurisdiction

Figure III.C.2.d St. Croix Assessment Units Completely Under Federal Jurisdiction

3. Causes and Sources of Designated Use Impairment

a) Eutrophication

Eutrophication is rarely observed in the Virgin Islands because of tidal flushing and currents driven by the Caribbean current and steady tradewind patterns.\textsuperscript{11}
b) Case Studies

The Unified Watershed Assessment includes a detailed summary of existing conditions for the 18 Coastal Zone Management Areas of Particular Concern. These APC reports contain water quality reports for each APC.

E. Wetlands Assessment

1. Introduction

Prior to October 31, 1978, the US Army Corps of Engineers, as delegated by 404 of the Clean Water Act, performed protection of wetlands in the Virgin Islands. After that date, all coastal wetland protection was mandated to the Department of Planning and Natural Resources, Division of Coastal Zone Management. Guidelines are found in VIC Title 12, Chapter 21, §.903(b)(8), which states that the Division’s responsibility is “to conserve ecologically significant resource areas for their contribution to marine productivity and value as wildlife habitats, and preserve the function and integrity of reefs, marine meadows, salt ponds, mangroves and other significant areas”.

2. Classification of Wetlands

Classification of wetlands is based on the US Fish and Wildlife Wetland and Deepwater Habitat System (Cowardin et al., 1979). Wetlands are grouped into four categories: tidal, seep, landlocked ponds, and spring tidal wetlands.

Tidal ponds or lagoons have narrow inlets connecting to the sea and have a salinity level that is slightly higher than seawater.

Seep ponds and landlocked ponds are not open to the sea, and have fluctuating water and salinity levels depending on rainfall.

Spring tidal wetlands fringe bays, but standing water only occurs during spring tides, when strong onshore winds push water into the wetlands, or during times of heavy rainfall and consequent flooding.

The primary source of wetland impairment is non-point source pollution, construction intrusions, and sedimentation from upland run-off.

Table III.D.1 Wetlands Classification12

[Classification of wetlands is based on the US Fish and Wildlife Wetland and Deepwater Habitat System (Cowardin et al., 1979).]

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<tr>
<td>Cabrita Peninsula</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore</td>
</tr>
<tr>
<td>Cowpet Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Vessup Bay</td>
<td>Estuarine, Intertidal, Forested,</td>
</tr>
<tr>
<td>Bolongo Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Cabe Point</td>
<td>Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Little St. James</td>
<td>Estuarine, Intertidal, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Salt Cay</td>
<td>Estuarine, Intertidal, Unconsolidated Mud,</td>
</tr>
<tr>
<td>Patricia Bay</td>
<td>Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Location</td>
<td>Classification</td>
</tr>
<tr>
<td>--------------</td>
<td>------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Muller Bay</td>
<td>Estuarine, Intertidal, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Water Island</td>
<td><strong>Classification</strong></td>
</tr>
<tr>
<td>Limestone Bay</td>
<td>Marine (Coastal), Intertidal, Unconsolidated Cobble gravel</td>
</tr>
<tr>
<td>Sprat Bay</td>
<td>Marine (Coastal), Intertidal, Unconsolidated sanded bottom</td>
</tr>
<tr>
<td>Sprat Point</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>St. John</td>
<td><strong>Classification</strong></td>
</tr>
<tr>
<td>Brown Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Leinster Bay</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore</td>
</tr>
<tr>
<td>Kiddel Bay</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Little Lameshur</td>
<td>Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Great Lameshur</td>
<td>Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Fish Bay</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore</td>
</tr>
<tr>
<td>Frank Bay</td>
<td>Estuarine, Intertidal, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Enighed Bay</td>
<td>Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Francis Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Salt Pond Bay</td>
<td>Marine (Coastal), Subtidal, Coral Reef, 2, Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td>Privateer Bay</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>South side Pond</td>
<td>Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Elk Bay</td>
<td>Estuarine, Intertidal, Unconsolidated, sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Water Creek</td>
<td>Estuarine, Sub-tidal, Unconsolidated bottom</td>
</tr>
<tr>
<td>Otter Creek</td>
<td>Estuarine, Sub-tidal, Unconsolidated bottom</td>
</tr>
<tr>
<td>Princess Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Coral Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated cobble gravel, Forested</td>
</tr>
<tr>
<td>Chocolate Hole</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Peter Bay</td>
<td>Estuarine, Intertidal, Forested,</td>
</tr>
<tr>
<td>Turner Point</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Newfound Bay</td>
<td>Estuarine, Intertidal, Unconsolidated Sanded shore,</td>
</tr>
<tr>
<td>Reef Bay</td>
<td>Estuarine, Intertidal, Forested,</td>
</tr>
</tbody>
</table>
3. Wetlands Protection Activities

The Department of Planning and Natural Resources very recently instituted a Wetlands Program. The program was short-lived though due to staffing problems.

F. Public Health/Aquatic Life Concerns

Pollution-caused fish kills, *ciguatera* or other abnormalities

The Department of Planning and Natural Resources keeps no log of fish kill incidents within the territory. DPNR will from time to time, however, issue public advisories when such incidents do occur.

Restrictions on swimming areas

- No sampling related to natural disasters (e.g. hurricanes) was conducted this cycle.
- Public advisories regarding beach water quality is broadcast over the available radio stations thorough the Virgin Islands Territory Emergency Management Agency (VITEMA) during the hurricane recovery period (interview with Officer Brad Thomas on March 16, 2000). Restrictions are also invoked when a sewage bypasses occurs that may be impacting a waterbody. The water quality sampling is performed by DPNR and a copy of the final results is forwarded to the Waste Management Authority and to the Department of Health’s Division of Environmental Health.

The continual monitoring for beach contamination caused by a bypass is performed by DPNR-DEP Under TPDES permit requirements the Waste Management Authority broadcasts over the airwaves and publishes in the local newspapers a public advisory regarding the bypass; however, this action does not negate the fact that the Commissioner of DPNR may broadcast or publish a public advisory if it is deemed necessary.

The BEACH program issues notices on a weekly basis for territorial beaches that are being monitored. Advisories are issued following discovery of enterococci impairments.

IV. GROUNDWATER ASSESSMENT

In the VI, ground water is held primarily in three types of aquifers, principally under water table or semi-confined conditions:

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calabash Boom</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore</td>
</tr>
<tr>
<td>Annaberg</td>
<td>Annaberg Estuarine,</td>
</tr>
<tr>
<td>Europa Bay</td>
<td>1. Estuarine, Intertidal, Scrub-shrub</td>
</tr>
<tr>
<td></td>
<td>2. Estuarine, Sub-tidal, Unconsolidated sanded bottom</td>
</tr>
<tr>
<td>Grooto Pain Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Hart Bay</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
<tr>
<td>Mary Point</td>
<td>Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub</td>
</tr>
</tbody>
</table>
1) Carbonate rock system in St. Croix, known as the Kingshill aquifer system
2) Fractured volcanic bedrock
3) Alluvial deposits

The ground water in the Virgin Islands is highly mineralized, often containing total dissolved solids (TDS) in excess of 1000 parts per million (ppm). Sodium, magnesium and calcium are the primary constituents, rendering continued consumption of untreated ground water unhealthy for those on a restricted sodium diet. Additionally, elevated nitrate levels and coliform bacteria have been found in some wells near the main sewer conveyance lines.

The Kingshill aquifer is the largest and most productive aquifer in the USVI. The aquifer has an area of 25 square miles and accounts for 67% of all groundwater withdrawals. Approximately one-third of the population (35,558 (census 2000)) of the entire USVI lives within the aquifer boundary area. Yields from wells can surpass 70,000 gpd/well. Most of the groundwater exists at relatively shallow depths in unconsolidated alluvial sediments or in shallow limestone deposits. The depth to groundwater could range from 5 feet (WAPA Concordia well field) to 60 feet (WAPA Golden Grove well field) below ground surface. Well yields ranged from less than 5 gallons per minute (gpm) (WAPA Adventure well field) to 80 gpm (WAPA Golden Grove well field). Aquifer specific capacity ranged from 1 to 14 gpm per foot draw down with a corresponding aquifer transmissivity ranging from 180 to 3,300 feet squared per day.

There are over 325 wells within the aquifer boundary and it is estimated that the total production of the aquifer is 2.21 MGD (WAPA, 1.13 MGD; private wells, 0.55 MGD; industrial/commercial 0.53 MGD). It is estimated that the aquifer can safely supply up to 2.5 MGD.

A. Permitting

The Ground Water program manages the installation of groundwater wells and groundwater withdrawals through a permitting system under Virgin Islands Code (VIC) Title 12, Chapter 5, Section 151 et seq. New wells can only be sited at locations providing adequate yield and a minimum risk of groundwater contamination from past, existing or future sources and activities.

Existing wells are regulated via groundwater appropriation permits that set groundwater withdrawal limits for the approved use, and are valid for a period of two years.

<table>
<thead>
<tr>
<th>District</th>
<th>No. of Wells</th>
<th>Estimated Total Pumping Rate (million gallons per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Croix*</td>
<td>1078</td>
<td>3.5</td>
</tr>
<tr>
<td>St. Thomas</td>
<td>600</td>
<td>1.2</td>
</tr>
<tr>
<td>St. John</td>
<td>100</td>
<td>0.2</td>
</tr>
</tbody>
</table>

* Excluding HOVENSA groundwater monitoring and product recovery wells, regulated by RCRA Part B operating permit.

<table>
<thead>
<tr>
<th>Period</th>
<th>New/Renewal appropriation permit</th>
<th>Drilling permit applications</th>
<th>Soil Boring permit applications</th>
<th>Drillers license issued</th>
</tr>
</thead>
</table>

Table IV.A.1 Number of permitted wells in the USVI

Table IV.A.2 Number of applications reviewed this reporting period
DPNR/DEP has identified seven “Key Themes” to guide groundwater management activities over the next decade:
1) Clarifying "Whose Water is it?"
2) Recognizing the Connections between Groundwater and Surface Water
3) Evaluating and Managing Threats to Groundwater Quality
4) Linking Land Use Planning and Groundwater Protection
5) Developing a Comprehensive Approach to Groundwater Quantity
6) Addressing Water Use and Conservation Issues
7) Collecting Long-Term Groundwater Data to Address Long-term Problems

1. Virgin Islands Water and Power Authority (WAPA)
The "major" water supplier in the VI is the Virgin Islands Water and Power Authority (WAPA). Ground water has the potential to contribute up to 30% (up to about 1 million gallons per day (MGD)) of the WAPA potable water supply on the island of St. Croix (when the well fields are operating at or near capacity). No ground water is used in the WAPA distribution system on St. Thomas and St. John at the present time; however, the authority has previously investigated the use of ground water in the Sugar Estate, St. Thomas and Estates Adrian and Carolina, St. John, to augment the desalinated water supply.
WAPA : St. Croix
On St. Croix, WAPA's principal water supply comes from desalination units, which are capable of producing about 3 MGD (storage capacity = 40 MG). Additionally, WAPA can potentially extract up to 1 MGD of ground water from seven (7) well fields. The principal aquifer in St. Croix is the Kingshill aquifer, predominantly a limestone aquifer that underlies the central portion of the island. The Estates Concordia, Adventure, Fairplains, Negro Bay and Barren Spot well fields tap this aquifer. The western Mahogany Road and La Grange well fields tap an alluvial and fractured bedrock aquifer.

WAPA : St. Thomas
On St. Thomas, WAPA provides desalinated water for distribution (approximately 2.2 MGD (storage capacity = 40 MG)). Although WAPA used several wells in the vicinity of the St. Thomas Hospital in Sugar Estate the late 1960s to the early 1980s, they are no longer used. As part of a recent ground water source exploration program designed for WAPA’s Emergency Ground Water Supply (EGWS) Program, the US Geological Survey (USGS) drilled several test wells in various locations on St. Thomas. USGS performed pumping tests on these wells in the Sugar Estate area, but to date, the wells have not been put into production.
WAPA : St. John
On St. John, WAPA’s principal potable water source is a 500,000 GPD vapor vacuum compression unit. Additionally, several wells were drilled on St. John under the EGWS program described above, but to date, with the exception of one well in Estate Carolina, the wells have not been put into production. The Estate Carolina WAPA well was put on line in the spring of 1994 as supplemental water supply for the eastern portion of St. John. The well provides mineral-rich water (TDS of approximately 2500 ppm) from a shallow, unconsolidated material aquifer, which is pumped into pressure tanks to meters for non-potable use only.

2. Public Water Systems that utilize groundwater
In addition to WAPA, water-hauling companies utilize wells as a secondary water supply source. Several water-hauling companies treat the ground water by reverse osmosis (RO), and then distribute the water via trucks to individual residences and businesses. Several water-bottling companies also do the same prior to bottling and distribution. These public water systems also include apartment complexes, schools, condominiums, hotels, bars and restaurants. In addition to drinking water quality monitoring parameters, these systems must monitor their well water for Total Dissolved Solids.

<table>
<thead>
<tr>
<th>Island</th>
<th>Number of Water Systems Utilizing Groundwater</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Community</td>
<td>Non-Transient, Non-Community</td>
<td>Transient, Non-Community</td>
<td>Bottled Water Plant</td>
</tr>
<tr>
<td>St. Croix</td>
<td>30</td>
<td>70</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>St. Thomas</td>
<td>43</td>
<td>69</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>St. John</td>
<td>7</td>
<td>11</td>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

Wellhead protection is vital to the long-term quality of life in the VI as the population increases. Fresh water is an especially valuable resource in the VI. The meager but important ground water resources are valuable supplements to the expensive, highly energy-consumptive desalinated water which is so heavily relied upon by the much of the population of the VI. Existing untainted ground water resources must be protected. The resources that have already been subjected to contamination by leaking underground storage tanks (USTs), leaking sewer lines and improper storage and disposal of chemicals must be managed to protect adjacent uncontaminated sources and restore damaged resources for future use.

B. Wellhead Protection Actualization Assessment

The Territory does not at this time have a formal Wellhead Protection Plan (WHPP). There is a Wellhead Protection Final Report which was intended to form the nexus for a WHPP. It is anticipated that a WHPP be developed following the US EPA example ordinance\(^2\). The categories of permitted and non-permitted activities around wellheads\(^3\) contained in the model ordinance will be used. See Table , below for examples of the most common problems in St. Croix.

\(^2\) The model is available at http://www.epa.gov/nps/ordinance/mol7.htm#groundwater.
\(^3\) Actually, in Zone 1, which for St. Croix is the 20-yr TOT radius.
Table IV.B.1  Non-Permitted uses in Zone 1

<table>
<thead>
<tr>
<th>Use</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile body/repair shop</td>
<td>1</td>
</tr>
<tr>
<td>Gas station</td>
<td>2</td>
</tr>
<tr>
<td>Fleet/trucking/bus terminal</td>
<td>3</td>
</tr>
<tr>
<td>Dry cleaner</td>
<td>4</td>
</tr>
<tr>
<td>Electrical/electronic manufacturing facility</td>
<td>5</td>
</tr>
<tr>
<td>Machine shop</td>
<td>6</td>
</tr>
<tr>
<td>Metal plating/finishing/fabricating facility</td>
<td>7</td>
</tr>
<tr>
<td>Chemical processing/storage facility</td>
<td>8</td>
</tr>
<tr>
<td>Wood preserving/treating facility</td>
<td>9</td>
</tr>
<tr>
<td>Junk/scrap/salvage yard</td>
<td>10</td>
</tr>
<tr>
<td>Mines/gravel pit</td>
<td>11</td>
</tr>
<tr>
<td>Irrigated nursery/greenhouse stock</td>
<td>12</td>
</tr>
<tr>
<td>Confined animal feeding operations</td>
<td>13</td>
</tr>
<tr>
<td>Land divisions resulting in high density (&gt;1 unit/acre) septic systems</td>
<td>14</td>
</tr>
<tr>
<td>Equipment maintenance/fueling areas</td>
<td>15</td>
</tr>
<tr>
<td>Injection wells/dry wells/sumps, except for single-family residences directing gutter downspouts to a drywell</td>
<td>16</td>
</tr>
<tr>
<td>Underground storage tanks, (except those with spill, overfill, and corrosion protection requirements in place)</td>
<td>17</td>
</tr>
<tr>
<td>All other facilities involving the collection, handling, manufacture, use, storage, transfer or disposal of any solid or liquid material or waste having potentially harmful impact on groundwater quality including illegal disposal of solid waste on the surface not directly associated with a facility</td>
<td>18</td>
</tr>
<tr>
<td>All uses not permitted in the underlying zone district</td>
<td>19</td>
</tr>
</tbody>
</table>

In Table , note that the sequential numbers are not intended as rankings; these numbers will be used to reference the specific threats in the database under development.

1. **Time of Travel Buffers**

It is abundantly clear that essentially none of the existing priority wells, vendors, WAPA or large user, will meet any of the Time-of-Travel (TOT) suggested, either of the Model Ordinance, which uses 1,000 feet radius (as typical of a 6-month TOT) or in the calculations which are both more rigorous and locally calculated but give 20-yr TOT’s radii of approximately 1,400 feet or less with most around 1,000 feet. Examples of these buffers are provided at Figure IV.C.20 and Figure
IV.C.21. On the La Grange TOT illustration (Figure IV.C.20) the primary threats are the number of residences, all with on-site wastewater treatment as well as solid waste, industrial waste and stored or abandoned equipment. For Negro Bay wells (Figure IV.C.21) the primary threats are solid waste (informal dumps) and possible spills from the National Guard facility and the several warehousing facilities to the North. Negro Bay and New Golden Grove are probably the best-sited wellfields on St. Croix from the standpoint of nearby risks; i.e., risks within the TOT wellhead protection area.

2. Flooding

All of the WAPA and vendor production wells and many of the large users’ wells are located in flood hazard areas (see Figure IV.C.19). Most WAPA wells are protected from inundation by reinforced concrete (RC) platforms and risers; an example is at Figure IV.C.1. These are typical of the wells inherited by WAPA from DPW and those developed by the Authority since. A much rarer WAPA well is at Figure IV.C.2 where the casing is continued to about 3’ above a platform but without the RC riser. This may be typical of wells developed by private owners and leased to WAPA.

A number of vendors and smaller users near WAPA production wells are notably susceptible to flooding or entry of contaminants through inadequate siting or poorly sealed or unsealed well heads. Illustrations of these are at Figure IV.C.3 through Figure 10.

3. Particular threats – poor siting or construction

There are a number of egregiously poor sites with wells; poor either because of sites selected and developed or because of poor or mismanagement of the wellhead area or areas adjacent. Since much of this development occurred before there was concerted effort to control development and manage wellhead impact areas there is little that can be done at this point. Some ideas are at discussed below in the section - Suggestions for Interim Measures. Often, in the case of adjacent problems, the well owner or operator has little or no control over the use of that area. An example of poor siting is at Figure IV.C.7; this is a shallow well with a compromised seal and subject to overland flows that could include significant amounts of diesel and material from the road.

An example of poor site management (and a very poor well seal) is at Figure IV.C.11 and Figure IV.C.12. While the fuel tank might not exceed the minimum to require containment, it is directly adjacent to a well. In addition, the wellhead is very poorly sealed.

Another example is at Figure IV.C.13 and Figure IV.C.14. Figure IV.C.14 is the cut-off well pipe and conduit for what was a production well at this site. This well is within 10 feet of a well in production for a water vendor and is, as may be seen, completely unprotected.

4. Summary

The most common threat to wells and well recharge areas are the ubiquitous aggregations of household, construction and mechanical solid waste. However, it is apparent that the efforts of the Waste Management Authority have borne fruit; much of this material no longer occurs with the density nor has the age once more common. Exceptions are piles of waste on private property (see Figure IV.C.15 and Figure IV.C.16).
It is important to note that few of these threats to groundwater are the result of intentional misconduct or malfeasance. More typically, they are the result of a lack of understanding of the possible consequences of action or inaction. DPNR will schedule some community consciousness-raising meetings, utilizing some school time for students, for example. In addition, reminding landowners and agencies of responsible land management and the fragility of the groundwater resource in the Territory might also pay dividends.

5. Suggestions for Interim Measures

The following suggestions assume that more staff time and effort will be available for implementing the permit program. While many wells had permits most have expired and many do not meet minimum requirements for permitting. For example, it is believed that most residential wells do not have meters and many commercial wells also do not have meters – or functioning meters – and reporting and permit renovation is not done. In addition, there are a number of large production wells that are not and have never been permitted.

a. Educate Licensed well drillers
DPNR/DEP issues well drillers license. DPNR/DEP will use the opportunity to focus educational efforts on the single entity (well drillers) that would touch every new well. If permitted well drillers were responsible for acquiring permits for wells a body of knowledgeable persons would be dealing with DPNR/DEP in the siting and development of new wells.

b. Individual existing wells
At least some effort should be made to assist owners and operators of production wells to reduce threats in the areas of their wellheads. The adoption of a wellhead protection plan should help resolve this, but in the interim assistance in the form of consumer education and assistance with enforcement of Territorial regulations on unpermitted solid waste sites, illegal dumping and storage and handling of liquids, toxic and hazardous materials could provide some relief for owners of wells subject to surface and sub-surface threats.

c. Relief for owners of permitted wells
The Territory should begin to ensure that all permits are current and that permit holders understand their responsibilities in ensuring the viability of groundwater resources in USVI. As part of this effort DPNR/DEP could provide assistance with cataloguing specific threats to permitted wells and provide permittees with an understanding of the possible effects of those threats to their water quality and a record of the then-current state at the time of renovation. In addition, DPNR/DEP could provide permittees with measures they can undertake to eliminate, reduce or manage those risks. As an incentive to renovating permits DPNR/DEP could provide well owner/permittees a specific time period to deal with threats under their control with no penalties.

C. WAPA wells

WAPA wells to remain in service
The WAPA wells that are to remain in service are shown at Table, below. WAPA has not used any groundwater since about April of 2010 since the RO unit at Richmond came on-line. The wells to be retained will be secured and stand-by power will be provided. As part of the work in this project the possibility of distributing normal power from a central location, probably the Fairplains Pump Station, will be considered and reported. This will ease the provision of stand-by power since a single large generator located at or near the central location could be provided and power distributed using the same network used for normal power. Individual costs are not provided at this time, though approximate costs will be part of the final report following consultations with WAPA on the form and generality of security and service-assurance techniques. All these wells use the Fair Plains pump station.

<table>
<thead>
<tr>
<th>Well#</th>
<th>Well Name</th>
<th>GPM</th>
<th>SWL</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Bethlehem</td>
<td>40</td>
<td>38.1</td>
<td>114.2</td>
</tr>
<tr>
<td>10</td>
<td>Bethlehem</td>
<td>40</td>
<td>27.6</td>
<td>121.3</td>
</tr>
<tr>
<td>5A</td>
<td>Negro Bay</td>
<td>10</td>
<td>52.7</td>
<td>110.5</td>
</tr>
<tr>
<td>5</td>
<td>Negro Bay</td>
<td>25</td>
<td>59.3</td>
<td>114.9</td>
</tr>
<tr>
<td>6</td>
<td>Negro Bay</td>
<td>20</td>
<td>65.3</td>
<td>130.1</td>
</tr>
<tr>
<td>7</td>
<td>Negro Bay</td>
<td>35</td>
<td>58.6</td>
<td>115.1</td>
</tr>
<tr>
<td>6</td>
<td>New Golden Grove</td>
<td>35</td>
<td>59.3</td>
<td>114.9</td>
</tr>
<tr>
<td>7</td>
<td>New Golden Grove</td>
<td>35</td>
<td>63.3</td>
<td>130.1</td>
</tr>
<tr>
<td>8</td>
<td>New Golden Grove</td>
<td>37</td>
<td>52.7</td>
<td>110.5</td>
</tr>
<tr>
<td>15A</td>
<td>New Golden Grove</td>
<td>40</td>
<td>62.1</td>
<td>122.5</td>
</tr>
</tbody>
</table>

Output of these wells, as reported by WAPA in 2010, sums to about 0.5 MGD (24-hr day, or 0.25/12 hr day). It remains to be seen if these will improve with reduced WAPA usage. DPNR/DEP has recommended placing well-level meters in at least one well in Negro Bay and one in New Golden Grove. Historical data for static water levels\(^3\) in St. Croix are shown at Figure IV.C.17 and Figure IV.C.18. As may be seen Negro Bay and New Golden Grove show the best levels.

Half a million gallons per day would approximate around 20-25% of normal production. In the event that these wells would become the sole source in the event of a weather or geologic event interrupting normal service WAPA and St. Croix could probably maintain minimal service for several weeks. The risk of such an event and the value of additional emergency production must be considered.

WAPA Wells not now scheduled for service beyond 2010

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\(^4\) These numbers will be standardized; at least two methods are currently in use.

\(^5\) Standing Water Level.
These are shown in Table . These are mostly wells that were developed and owned by others and WAPA has or will let leaseholds lapse. Owners will be advised that these wells must either be permitted and comply with construction and protection norms or abandoned and closed properly. WAPA-owned wells will be subject to the same requirements.

<table>
<thead>
<tr>
<th>Well#</th>
<th>Well Name</th>
<th>GPM</th>
<th>SWL</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Adventure</td>
<td>7</td>
<td>25.6</td>
<td>88.2</td>
</tr>
<tr>
<td>19</td>
<td>Adventure</td>
<td>10</td>
<td>35.6</td>
<td>100.2</td>
</tr>
<tr>
<td>20</td>
<td>Adventure</td>
<td>14</td>
<td>33.6</td>
<td>97.6</td>
</tr>
<tr>
<td>5</td>
<td>Adventure</td>
<td>25</td>
<td>31.5</td>
<td>103.3</td>
</tr>
<tr>
<td>6</td>
<td>Adventure</td>
<td>13</td>
<td>39.3</td>
<td>99.2</td>
</tr>
<tr>
<td>8</td>
<td>Adventure</td>
<td>13</td>
<td>25.7</td>
<td>85.9</td>
</tr>
<tr>
<td>1</td>
<td>Fairplain</td>
<td>10</td>
<td>27.1</td>
<td>86.7</td>
</tr>
<tr>
<td>1</td>
<td>Old Golden Grove</td>
<td>10</td>
<td>29</td>
<td>91.3</td>
</tr>
<tr>
<td>15</td>
<td>Old Golden Grove</td>
<td>12</td>
<td>33.5</td>
<td>94.5</td>
</tr>
<tr>
<td>16</td>
<td>Old Golden Grove</td>
<td>13</td>
<td>35.7</td>
<td>86.7</td>
</tr>
<tr>
<td>21</td>
<td>Old Golden Grove</td>
<td>14</td>
<td>28.7</td>
<td>91.4</td>
</tr>
</tbody>
</table>

In addition to the wells and well fields above, the following well fields (see Table , below) have been in production or were developed at one time and will be visited and checked for WHPP compliance. Those that have reverted to private hands will be noted and DPNR will schedule dates for closing or rehabilitation, sanitary seal acceptability and security. A priority schedule will be developed.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Number of Wells/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosperity</td>
<td>Name used for La Grange and Mahogany Road wells at one time</td>
</tr>
<tr>
<td>Mahogany Road</td>
<td>4 All require proper closure or improved protection and seals if owner wants to continue use.</td>
</tr>
<tr>
<td>La Grange</td>
<td>2 Operated by Crystal Springs at this point.</td>
</tr>
<tr>
<td>Old Golden Grove</td>
<td>4</td>
</tr>
<tr>
<td>Barren Spot</td>
<td>9</td>
</tr>
</tbody>
</table>
### Wells selected by the amount of water pumped.

The amount of pumpage is generally uncertain and our cut-off is 6,000 gallons per day (gpd, ~2MG per year). The first priority for these wells will be to verify the production numbers.

It is known that a number of these wells belong in the high-risk category, in addition. For example, several of these wells are known to be located in parking lots though they are not precisely located. These are shown at Table IV.C.. In general, these have the same threats as do the WAPA wells, with the added problem that they can be very near unsewered population centers.

### Wells prioritized by risk.

Risk is used as an analog for the population served or effected by this source and is estimated by:

- a. Type of purveyor
  - i. Water Source (vendors, standpipe)
  - ii. Bottled Water vendor or source
  - iii. Condominiums
  - iv. Apts
  - v. Hotels

- b. Population served
  - i. Total for Condos, Apts and Hotels
  - ii. NT for others

There are a total of approximately 60 wells in addition to the WAPA wells, or about 140 wells in all. These are listed in Table IV.C.6.

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Number of Wells/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventure</td>
<td>9</td>
</tr>
<tr>
<td>All are acceptable; will need improved security if owner desires to use these.</td>
<td></td>
</tr>
<tr>
<td>Concordia</td>
<td>5</td>
</tr>
</tbody>
</table>
Figure IV.C.1. WAPA well with typical platform and riser.

Figure IV.C.2. Untypical WAPA well.
Figure IV.C.3. Cover of well in parking lot.

Figure IV.C.4. Wellhead in sump condition with open sanitary seal (rope and flexible conduit for pump).
Figure IV.C.5. Well with possible surface sources of contamination; note ditch from cistern/wastewater overflow and dumpster.

Figure IV.C.6. Wellhead with compromised sanitary seal and cut in casing.
Figure IV.C.7. Francis Water Delivery well site. Google Earth.

Figure IV.C.8. Francis Water Site; 1 is well house, 2 is oil tank and ditch.
Figure IV.C.9. View from North, near well house. Note slope towards well.

Figure IV.C.10. Well head and pump, shallow Francis Water Delivery well.
Figure IV.C.11. Laundromat well without effective seal.

Figure IV.C.12. Diesel tank without containment adjacent to well.
Figure IV.C.13. Production well for vendor; note the galvanized cover.

Figure IV.C.14. What’s under the cover; this abandoned well is adjacent to a production well providing potable water.
Figure IV.C.15. Trash near Bethlehem Ghut and wells.

Figure IV.C.16. Abandoned Caustic tank near Bethlehem Ghut and wells.
<table>
<thead>
<tr>
<th>PROPERTY_OWNER</th>
<th>PUMP_RATE (DAILY, ~2000)</th>
<th>STATUS for this project</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARGASSO CORPORATION</td>
<td>628,000</td>
<td>Same wells; these are in the littoral and are essentially seawater. No further action</td>
</tr>
<tr>
<td>SUNTERRA RESORTS (CARAMBOLA)</td>
<td>628,000</td>
<td></td>
</tr>
<tr>
<td>FRANCIS, WILMOTH</td>
<td>628,000</td>
<td></td>
</tr>
<tr>
<td>VI RUM INDUSTRIES LTD</td>
<td>176,000&lt;sup&gt;6&lt;/sup&gt;</td>
<td>Need security and several need flood protection.</td>
</tr>
<tr>
<td>BUCCANEER HOTEL, THE</td>
<td>140,000</td>
<td>Security</td>
</tr>
<tr>
<td>SEVEN SEAS WATER CORP.</td>
<td>60,000</td>
<td>Security, these are brackish water wells for RO.</td>
</tr>
<tr>
<td>MCM TRUCKING</td>
<td>60,000</td>
<td>Unknown</td>
</tr>
<tr>
<td>LINDQUIST, ALBERT (DIAMOND WATER CO.)</td>
<td>56,000</td>
<td>Also Ideal Water – Out of service; wells to be properly closed.</td>
</tr>
<tr>
<td>O’NEIL, RAYMOND &amp; CANTON, REUBEN</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>GRENMA PEPPER TREE TERR.</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>SCHUSTER, CHARLES O.</td>
<td>50,000</td>
<td>See Schuster Water; former well in Strawberry now abandoned in Emmanuel Water Service site. Requires proper closure.</td>
</tr>
<tr>
<td>VI PORT AUTHORITY</td>
<td>45,000</td>
<td>Fire Service only</td>
</tr>
<tr>
<td>GRAPETREE SHORES INC.</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>HENDERSON, FLEMING (LA GRANGE TRUST, INC.)</td>
<td>30,000</td>
<td>Operated as Crystal Water; typical WHP area threats.</td>
</tr>
<tr>
<td>CURRAN, CHERIE</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>BAPTISTE, SHAWN</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>LOFTUS, NOEL</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>PAUL, NEVILLE</td>
<td>23,000</td>
<td></td>
</tr>
<tr>
<td>YUSUF, FATHI</td>
<td>23,000</td>
<td>United Water – Sion Farm Plaza. Wellhead improvements, numerous surface threats. Well for water sales out of service.</td>
</tr>
<tr>
<td>THE REEF ASSOCIATION</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>YUSUF, MIKE</td>
<td>20,000</td>
<td>Plaza. Wellhead improvements, numerous surface threats.</td>
</tr>
<tr>
<td>COUNTRY DAY SCHOOL</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>UNIVERSITY OF THE VIRGIN ISLANDS</td>
<td>15,000</td>
<td>Wells used only after failure of supply in rainwater capture cisterns and for kitchen. Good siting and protection; normal areal concerns.</td>
</tr>
</tbody>
</table>

<sup>6</sup> VI Rum has recently applied for a permit to withdraw 250,000 gpd.
<table>
<thead>
<tr>
<th>PROPERTY_OWNER</th>
<th>PUMP_RATE (DAILY, ~2000)</th>
<th>STATUS for this project</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAKLEY BAY CONDOMINIUMS</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>GOOD HOPE COMMUNITY TOWN HOUSE</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td>COAKLEY BAY TOWNHOUSE</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>GALLOWAY, IRA</td>
<td>12,000</td>
<td>Out of service; compliant, but surface threats in area.</td>
</tr>
<tr>
<td>ARMSTRONG, ROBERT D.</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>BRUGAL RUM &amp; CO</td>
<td>7,500</td>
<td>Out of service; needs proper closure.</td>
</tr>
<tr>
<td>HARBOR VIEW APARTMENTS</td>
<td>7,200</td>
<td></td>
</tr>
<tr>
<td>CHEUER, WALTER (prob typo for following)</td>
<td>7,200</td>
<td>Nominally out of service, not yet verified.</td>
</tr>
<tr>
<td>SCHEUER, WALTER</td>
<td>7,200</td>
<td></td>
</tr>
<tr>
<td>SCHIERLOH, CORNELIA</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>CANDLE REEF II ASSOCIATION</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>MAHARAJ, PREMA (LA REINE LAUNDROMAT)</td>
<td>6,000</td>
<td>Usage estimate is considered low. Wellhead improvements, numerous surface threats.</td>
</tr>
<tr>
<td>Yusuf, Carl</td>
<td>~60</td>
<td>Poorly protected, serious threats on surface and very near WAPA Bethlehem wells and Bethlehem Ghut. Owner responsive.</td>
</tr>
<tr>
<td>VIAPCO</td>
<td>1,500</td>
<td>Well#1 good wellhead protection, well#2 poor. Company is aware and are planning rehabilitation. Surface threats.</td>
</tr>
<tr>
<td>Du-N-Save Laundromat</td>
<td>3,000</td>
<td>Well fair; site needs some work and are threats from work to South.</td>
</tr>
<tr>
<td>VIP Concrete</td>
<td>1,200(?)</td>
<td>Use seems unlikely; surface threats significant; wellhead fair.</td>
</tr>
<tr>
<td>Bureau of Corrections</td>
<td></td>
<td>Well under rehabilitation outside facility; may be other and this will be followed-up.</td>
</tr>
<tr>
<td>USDA Wells</td>
<td></td>
<td>Located well 2-C; need to verify production and other wells.</td>
</tr>
<tr>
<td>Contractor’s Cement</td>
<td>100</td>
<td>This well was thought to be contaminated by leakage from gas station; production is very low and supplemented by purchased WAPA water. Well siting good and wellhead acceptable.</td>
</tr>
<tr>
<td>System Name</td>
<td>Class</td>
<td>Category</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------</td>
<td>------------</td>
</tr>
<tr>
<td>Aqua-Mist</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Francis Water Service Delivery &amp; Sales</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Francis Purified Water</td>
<td>BW</td>
<td>Bottled</td>
</tr>
<tr>
<td>Bates Trucking</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Caledonia Spring</td>
<td>TNC</td>
<td>Bottled</td>
</tr>
<tr>
<td>Country Water</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Crystal Springs</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Marcos Trucking</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Carlton Gardens</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Emmanuel's Service</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Galloway's Delivery</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Schuster Water Delivery (Blue Mountain Water)</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Southgate Gardens</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>United Corp. Standpipe</td>
<td>TNC</td>
<td>Water</td>
</tr>
<tr>
<td>Carino's Water Service</td>
<td>TNC</td>
<td>Water</td>
</tr>
</tbody>
</table>

Table IV.C.5. Wells selected by risk to populace

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Table IV.C.5. Wells selected by risk to populace

<table>
<thead>
<tr>
<th>System Name</th>
<th>Class</th>
<th>Category</th>
<th>Source</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown vendor</td>
<td></td>
<td></td>
<td>GW</td>
<td>Near USVI National Guard at corner of MG Jean Augustine Romney Memorial Drive. Not able to enter, but significant threat from heavy use for livestock on site.</td>
</tr>
<tr>
<td>Paradise Purification</td>
<td>BW</td>
<td>Bottled Water</td>
<td>W/GW</td>
<td>Shallow well nominally out of service. Well and seal are acceptable but significant areal threats.</td>
</tr>
<tr>
<td>Divi Carina Bay Resort</td>
<td>NTNC</td>
<td>Hotel</td>
<td>GWR</td>
<td></td>
</tr>
<tr>
<td>Sunny Isle Shopping Center</td>
<td>NTNC</td>
<td>Corp</td>
<td>R/GW</td>
<td>Wells not all seen; to date are well done and seals are acceptable.</td>
</tr>
<tr>
<td>Lorraine Village</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>20 &amp; 21-A Estate Plessen</td>
</tr>
<tr>
<td>Buccaneer Hotel (replicate of use table)</td>
<td>NTNC</td>
<td>Hotel</td>
<td>R/GW</td>
<td>Estate Shoy</td>
</tr>
<tr>
<td>Diamond Cinema</td>
<td>NTNC</td>
<td>Corp</td>
<td>R/GW</td>
<td>Plot# 93A Estate Diamond</td>
</tr>
<tr>
<td>Med-Isle I</td>
<td>NTNC</td>
<td>Corp</td>
<td>R/W/GW</td>
<td>29D Estate Diamond-Suite 47</td>
</tr>
<tr>
<td>Village Mall</td>
<td>NTNC</td>
<td>Corp</td>
<td>R/WGW</td>
<td>113 Estate Barren Spot</td>
</tr>
<tr>
<td>St. Croix Mutual Homes #14/15</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>Well protected and seal acceptable.</td>
</tr>
<tr>
<td>St. Croix Mutual Homes #22/23</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>Well protected and seal acceptable.</td>
</tr>
<tr>
<td>St. Croix Mutual Homes #36</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>Well protected and seal acceptable.</td>
</tr>
<tr>
<td>St. Croix Mutual Homes #44/45</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>Not served by wells</td>
</tr>
<tr>
<td>St. Croix Mutual Homes #54/55</td>
<td>C</td>
<td>Apt</td>
<td>R/W/GW</td>
<td>Not served by wells</td>
</tr>
<tr>
<td>Queen Louise Home*</td>
<td>C</td>
<td>Corp</td>
<td>R/GW</td>
<td>71 Estate Concordia</td>
</tr>
</tbody>
</table>
Figure IV.C.17. Average Static Water levels in wells on St. Croix.
Figure IV.C.18. Static water levels, central St. Croix.
Figure IV.C.19. Flood Risks and Production Wells
Figure IV.C.20. Wellhead Protection Zone, La Grange
Appendix 1: 2010 303(d) List of Impaired Waters
<table>
<thead>
<tr>
<th>AU ID</th>
<th>AU Name</th>
<th>Monitoring Stations</th>
<th>Priority</th>
<th>Class</th>
<th>Impairment</th>
<th>Source</th>
<th>Listed in 2008</th>
<th>Tentative TMDL Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI-STC-02</td>
<td>Frederiksted Harbor</td>
<td>STC-29, STC-28, VI970611</td>
<td>Medium</td>
<td>C</td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Urban Runoff/Storm Sewers Highway/Road/Bridge Runoff (Non-construction Related)</td>
<td>Yes</td>
<td>2014</td>
</tr>
<tr>
<td>VI-STC-04</td>
<td>Prosperity, Nearshore</td>
<td>VI252619</td>
<td>Low</td>
<td>B</td>
<td>Turbidity</td>
<td>Erosion and Sedimentation</td>
<td>No</td>
<td>2014</td>
</tr>
<tr>
<td>VI-STC-06</td>
<td>Sprat Hall Beach</td>
<td>STC-30, VI645288</td>
<td>Low</td>
<td>B</td>
<td>Phosphorus, Turbidity, Dissolved Oxygen</td>
<td>Unknown</td>
<td>Yes</td>
<td>2014</td>
</tr>
<tr>
<td>VI-STC-12</td>
<td>Cane Bay</td>
<td>VI201013</td>
<td>Low</td>
<td>B</td>
<td>Turbidity</td>
<td>Erosion and Sedimentation</td>
<td>No</td>
<td>2020</td>
</tr>
<tr>
<td>VI-STC-13</td>
<td>Baron Bluff Subwatershed</td>
<td>STC-31, VI398766</td>
<td>Low</td>
<td>B</td>
<td>Enterococcus, Dissolved Oxygen, Turbidity</td>
<td>Impacts from Resort Areas</td>
<td>Yes</td>
<td>2020</td>
</tr>
<tr>
<td>VI-STC-16</td>
<td>Salt River Lagoon, Marina</td>
<td>STC-33, STC-33C</td>
<td>Low</td>
<td>B</td>
<td>Enterococci, Fecal Coliform, Turbidity</td>
<td>Erosion from Derelict Land (Barren Land) Other Marina/Boating On-vessel Discharges</td>
<td>Yes</td>
<td>2020</td>
</tr>
<tr>
<td>VI-STC-18</td>
<td>Salt River Bay</td>
<td>STC-33A and STC-33B,</td>
<td>Low</td>
<td>B</td>
<td>Turbidity</td>
<td>Land Development Erosion and</td>
<td>No</td>
<td>2020</td>
</tr>
<tr>
<td>Location</td>
<td>STC IDs</td>
<td>pH, Turbidity, Enterococci</td>
<td>Sedimentation/Urban Runoff/Storm Sewers</td>
<td>Erosion and Sedimentation</td>
<td>Yes/No</td>
<td>Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------</td>
<td>-----------------------------</td>
<td>-----------------------------------------</td>
<td>---------------------------</td>
<td>--------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>St. Croix-By-the-Sea</td>
<td>STC-34, VI738082</td>
<td>Low B</td>
<td>Urban Runoff/Storm Sewers</td>
<td>Erosion and Sedimentation</td>
<td>Yes</td>
<td>2023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Reef Backreef, west</td>
<td>STC-48</td>
<td>Low B</td>
<td>Marina/Boating Sanitary On-vessel Discharges</td>
<td></td>
<td>No</td>
<td>2023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christinsted Harbor</td>
<td>STC-40, STC-43, VI572166</td>
<td>Low C</td>
<td>Fecal Coliform, Turbidity, Enterococci</td>
<td>Discharges from Municipal Combined Storm Sewer Systems</td>
<td>No</td>
<td>2023</td>
<td></td>
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*Table showing various parameters for different locations, including Secchi Depth, Turbidity, Fecal Coliform, Dissolved Oxygen, and Land Development Erosion and Sedimentation.*
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<td>----------------------------</td>
</tr>
<tr>
<td>VI-STT-37</td>
<td>Frenchman Bay</td>
<td>STT-29A, VI891065</td>
<td>Med</td>
<td>B</td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Other Recreational Pollution Sources</td>
<td>Yes</td>
</tr>
<tr>
<td>VI-STT-38</td>
<td>Limetree Bay</td>
<td>STT-29B,</td>
<td>Low/Med</td>
<td>B</td>
<td>Dissolved</td>
<td>On-site Treatment</td>
<td>Yes</td>
</tr>
<tr>
<td>Monitoring Station</td>
<td>Location</td>
<td>Code(s)</td>
<td>Dissolved Oxygen</td>
<td>Enterococci, Fecal Coliform, Turbidity</td>
<td>Source(s)</td>
<td></td>
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<td>Erosion from Derelict Land (Barren Land)</td>
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<td></td>
<td></td>
<td></td>
<td>Highways, Roads, Bridges, Infrastructure (New Construction)</td>
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<td></td>
<td></td>
<td>Impacts from Resort Areas (Winter and Non-winter Resorts)</td>
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<tr>
<td>VI-STT-40</td>
<td>Pacquereau Bay</td>
<td>STT-31A</td>
<td>Med</td>
<td>B</td>
<td>Dissolved Oxygen</td>
<td>Sources Unknown</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fecal Coliform, Turbidity</td>
<td>Other</td>
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<td>2013</td>
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<td>VI-STT-43</td>
<td>St. Thomas Harbor, Inner</td>
<td>STT-1, STT-39</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen</td>
<td>Non-Point Source, Marina Boat Maintenance, Marina/Boating Pumpout Releases</td>
<td></td>
</tr>
<tr>
<td></td>
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<td>2030</td>
</tr>
<tr>
<td>Site Code</td>
<td>Site Name</td>
<td>Region Code</td>
<td>Lat/Lon</td>
<td>Category</td>
<td>Impacted</td>
<td>Mitigation Measures</td>
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<tr>
<td>VI-STT-46</td>
<td>Sprat Bay STT-42</td>
<td>Low B</td>
<td></td>
<td>Dissolved Oxygen</td>
<td>Residential</td>
<td>Dredging (e.g., for Navigation Channels)</td>
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<td>Wastes from Pets</td>
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<td>Other Spill Related Impacts</td>
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<td>Other Marina/Boating On-vessel Discharges</td>
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<tr>
<td>VI-STT-47</td>
<td>Hassel Island at Haulover Cut to Regis Point STT-2, STT-3</td>
<td>Low C</td>
<td>Enterococci, Dissolved Oxygen, Fecal Coliform, Turbidity</td>
<td>Highway/ Road/ Bridge Runoff (Non-construction) Ballast Water Releases</td>
<td>Land Development Erosion and Sedimentation</td>
<td>Yes</td>
<td>2030</td>
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<tr>
<td>VI-STT-49</td>
<td>Druif Bay STT-40</td>
<td>Low B</td>
<td></td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Commercial Ferries</td>
<td>Residential Districts</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>Other Marina/Boating On-vessel Discharges</td>
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</tr>
<tr>
<td>VI-STT-50</td>
<td>Flamingo Bay STT-41</td>
<td>Low B</td>
<td></td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Other Recreational Pollution Sources</td>
<td>Yes</td>
<td>2030</td>
</tr>
<tr>
<td>VI-STT-51</td>
<td>Krum Bay STT-4</td>
<td>Low C</td>
<td></td>
<td>Fecal</td>
<td>Other Marina/Boating On-vessel Discharges</td>
<td>No</td>
<td>2030</td>
</tr>
<tr>
<td>Code</td>
<td>Location</td>
<td>Subwatershed</td>
<td>Category</td>
<td>Coliform</td>
<td>Other Recreational Pollution Sources</td>
<td>Year</td>
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<tr>
<td>VI-STT-52</td>
<td>Lindbergh Bay</td>
<td>STT-5A, STT-5B, VI514102</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen, Turbidity</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td>Cyril E. King Airport Subwatershed, Offshore</td>
<td>STT-6C</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Major Municipal Point Source</td>
<td></td>
</tr>
<tr>
<td>VI-STT-53</td>
<td>Perseverance Bay, Offshore</td>
<td>STT-6B</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen, Turbidity</td>
<td>Erosion and Sedimentation</td>
<td></td>
</tr>
<tr>
<td>VI-STT-54</td>
<td>Brewers Bay</td>
<td>STT-7A, VI293962</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen, Turbidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Perseverance Bay</td>
<td>STT-7B</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen</td>
<td>Erosion and Sedimentation</td>
<td></td>
</tr>
<tr>
<td>VI-STT-55</td>
<td></td>
<td>STT-8</td>
<td>Low</td>
<td>B</td>
<td>Dissolved Oxygen, Enterococci, Turbidity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VI-STT-56</td>
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<td></td>
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<td>Erosion and Sedimentation</td>
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</tr>
<tr>
<td>VI-STT-57</td>
<td>Fortuna Bay</td>
<td>STT-8</td>
<td>Low</td>
<td>B</td>
<td>Erosion and Sedimentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Key**

- Text in red = parameter/AU eligible for delisting next cycle
- Text in green = new listings

2010 USVI Integrated Report
Appendix 2: Responsiveness Summary 2010 US Virgin Islands List of Impaired Waterbodies & Assessment Methodology

2010 Responsiveness Summary
September 2010

Prepared By:
Department of Planning & Natural Resources
Division of Environmental Protection
I. Introduction

The Virgin Islands Department of Planning and Natural Resources (DPNR) Division of Environmental Protection (DEP) has prepared this report to summarize and respond to the comments received on the public noticed drafts of the US Virgin Islands 2010 List of Impaired Waterbodies and Assessment Methodology.

Comments were only received from the United States Environmental Protection Agency Region 2 (EPA) staff during the 30-day public notice period. The public comment period began on July 28, 2010 and ended on August 30, 2010. The public comment period was published in both local newspapers: The Virgin Islands Daily News and The Avis. Additionally, the public notice was posted on the DPNR-DEP website at the following link: http://dep.dpnr.gov.vi/documents/release.php?act=view_release_desc&release_id=86

II. Comments

Below is a summary of the comments received by DPNR and DPNR’s responses to those comments:

Comments received on the Draft List of Impaired Waters

<table>
<thead>
<tr>
<th>Number</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Please find below the 2008 AU ID/Impairment combinations missing from the 2010 303(d) List:</td>
<td>DPNR determined the following 2008 AU ID/Impairment combinations were not missing from the 2010 303(d) List:</td>
</tr>
<tr>
<td></td>
<td>VI-STC-24/Enterococci</td>
<td>VI-STT-05/Dissolved Oxygen &amp; Turbidity</td>
</tr>
<tr>
<td></td>
<td>VI-STC-62/Fecal Coliform</td>
<td>VI-STT-07/Dissolved Oxygen &amp; Turbidity</td>
</tr>
<tr>
<td></td>
<td>VI-STJ-01/Dissolved Oxygen &amp; Turbidity</td>
<td>VI-STT-15/Dissolved Oxygen &amp; pH</td>
</tr>
<tr>
<td></td>
<td>VI-STJ-02/Dissolved Oxygen</td>
<td>VI-STT-22/Dissolved Oxygen &amp; Turbidity</td>
</tr>
<tr>
<td></td>
<td>VI-STJ-03/Dissolved Oxygen</td>
<td>VI-STT-57/Dissolved Oxygen</td>
</tr>
<tr>
<td></td>
<td>VI-STJ-05/Dissolved Oxygen</td>
<td>DPNR determined the following 2008 AU ID/Impairment combinations were missing from the 2010 303(d) List and have been added:</td>
</tr>
<tr>
<td></td>
<td>VI-STJ-06/Dissolved Oxygen &amp; Turbidity</td>
<td>VI-STJ-01/Dissolved Oxygen &amp; Turbidity</td>
</tr>
<tr>
<td></td>
<td>VI-STT-05/Dissolved Oxygen &amp; Turbidity</td>
<td>VI-STJ-02/Dissolved Oxygen</td>
</tr>
<tr>
<td></td>
<td>VI-STT-07/Dissolved Oxygen &amp; Turbidity</td>
<td>VI-STJ-03/Dissolved Oxygen</td>
</tr>
<tr>
<td></td>
<td>VI-STT-15/Dissolved Oxygen &amp; pH</td>
<td>VI-STJ-05/Dissolved Oxygen</td>
</tr>
<tr>
<td></td>
<td>VI-STT-22/Dissolved Oxygen &amp; Turbidity</td>
<td>VI-STJ-06/Dissolved Oxygen &amp; Turbidity</td>
</tr>
<tr>
<td></td>
<td>VI-STT-57/Dissolved Oxygen</td>
<td>VI-STC-24/Enterococci</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VI-STC-62/Fecal Coliform</td>
</tr>
</tbody>
</table>

| 2      | With regards to the prioritization, it seems pretty aggressive that they will develop TMDLs in 2011 for waterbodies spread across all three islands when traditionally they have rotated efforts as well as targeted impaired waters that are geographically co-located: | DPNR has reassessed its prioritizations for TMDL development and revised the 303(d) List to target impaired waters that are geographically co-located. |
|        | VI-STC-59 Canegarden Bay | As such 2011 TMDL development goal will focus on the Green Cay Area, on the Northeastern coast of St. Croix. Assessment Units to be included in this round of TMDLs are VI-STC-35, VI-STC-36 and VI-STC-37. |
|        | VI-STC-63 Martin-Marietta Alumina Harbor | TMDL development in 2012 will target the Coral Bay Area on the Eastern coast of St. John. Assessment Units to be included in this round of TMDLs are VI-STJ-15. |
|        | VI-STC-64 Manning Bay/Estate Anguilla Beach |  |
|        | VI-STC-65 Hovensa, West |  |
|        | VI-STJ-15 Round Bay |  |
|        | VI-STJ-26 Chocolate Hole |  |
VI-STT-37 Frenchman Bay
VI-STT-38 Limetree Bay
VI-STT-52 Lindbergh Bay
VI-STT-53 Cyril E. King Airport Subwatershed, Offshore

The same comment goes for the TMDLs slated for 2012:
VI-STC-02 Frederiksted Harbor
VI-STC-13 Baron Bluff Subwatershed
VI-STJ-25 Rendezvous Bay subwatershed, offshore
VI-STJ-30 Cruz Bay
VI-STT-13 Mandahl Bay (Marina)
VI-STT-17 Mandahl Bay Subwatershed, Offshore
VI-STT-25 Great Bay
VI-STT-28 Cowpet Bay
VI-STT-36 Frenchman Bay Subwatershed East
VI-STT-46 Sprat Bay
VI-STT-47 Hassel Island at Haulover Cut to Regis Point
VI-STT-49 Druif Bay
VI-STT-51 Krum Bay
VI-STT-54 Perseverance Bay, Offshore
VI-STT-55 Brewers Bay

3. Also, pollutant loads that create impairments of pH and turbidity are not easily characterized. Pollutant loads that create impairments of low dissolved oxygen are characterized but could use study on how sediment oxygen demand is being created.

I would recommend that the USVI start aggressive efforts in collecting data now from their priority waters for the TMDL analysis and schedule their TMDL development sometime soon later.

DPNR appreciates these recommendations and currently has plans to begin sediment studies in collaboration with the University of the Virgin Islands in late 2010. DPNR-DEP also intends to look into additional similar studies in priority waters.

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**Comments received on the Draft Assessment Methodology**

<table>
<thead>
<tr>
<th>Number</th>
<th>Comment</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The methodology states &quot;The US Virgin Islands has not identified any freshwater with designated uses or established water quality standards for freshwaters.&quot; Freshwaters are included in the USVI WQS under the general [narrative] water quality criteria (§ 186-1): <a href="http://www.dpnr.gov.vi/dep/pubs/2010_VIWQS.pdf">http://www.dpnr.gov.vi/dep/pubs/2010_VIWQS.pdf</a> Also, freshwater invertebrates are discussed in DPNR's 2005 Comprehensive Wildlife Conservation Strategy: &quot;Freshwater fauna includes snails, crabs, crayfish, and a variety of insects.&quot; <a href="http://www.dpnr.gov.vi/dep/pubs/Responsiveness%20Summary%20to%20the%202006%20USVI.pdf">http://www.dpnr.gov.vi/dep/pubs/Responsiveness%20Summary%20to%20the%202006%20USVI.pdf</a> The University of the Virgin Islands has also documented confirmed sightings of the American Eel in their report entitled &quot;Watercourses As Landscapes In The U.S. Virgin Islands&quot;</td>
<td>DPNR has revised this section of the Assessment Methodology to clarify that freshwaters are included within the definition of “Waters of the VI” and as such these waters are covered by the VI Water Quality Standards (WQS). DPNR acknowledge the receipt of this comment and although not included during the 2010 WQS Triennial Review; DPNR will consider making such amendments to the Water Quality Standards for the US Virgin Islands during its next revision cycle.</td>
</tr>
</tbody>
</table>
Islands: State Of Knowledge" (October 2008):
http://www.uvi.edu/sites/uvi/Publications/watercourses_landscapes.pdf

This was brought to the attention of the USVI during the public comment period of the 2006 list:

http://www.dpnr.gov.vi/dep/pubs/Responsiveness%20Summary%20to%20the%202006%20USVI.pdf

"Comment: We are concerned that there are no definitions, classifications, or standards for freshwater systems. The US Virgin Islands has several major streams, locally known as guts or runs. These include Turpentine Run and Dorothea Gut in St. Thomas, and Creque Dam in St. Croix. These and other intermittent streams in the Virgin Islands are habitats for native stream fauna such as the river shrimp and mountain mullet. While these freshwater systems may be intermittent during most of the year, they can definitely affect water quality of the bays into which they discharge. Maintaining water quality in the upper watershed is paramount to maintaining water quality in the nearshore waters and bays. However, currently there are no water quality criteria for any of the freshwater habitats in the US Virgin Islands. We continue to recommend that the DPNR consider adding the few major guts found in the USVI to its water quality standards and 303(d) lists.

Response: The DPNR will consider making such amendments to the Water Quality Standards for the US Virgin Islands in the upcoming revision cycle."

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| 2. | How do you assess Class A waters and what criteria do you use to delineate “natural phenomena”? | Class A waters are assessed based on VI WQS Chapter 7 §186-2

**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.

DPNR defines “natural phenomena” as the historical condition of an area; DPNR, however, does not have any other criteria by which to delineate this condition.

| 3. | Any criteria for Class A waters? | Class A waters are assessed based on VI WQS Chapter 7 §186-2

**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.

This information has been added to the Assessment Methodology document.

| 4. | What are natural sources? Do you have a baseline data set on | DPNR corrected this statement and replaced the |

2010 USVI Integrated Report
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<p>| | | |</p>
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<tr>
<td>these?</td>
<td>word “sources” with “conditions”. Natural conditions are the same as natural phenomena DPNR defines these as the historical condition of an area. DPNR does not have an official baseline data set for these conditions.</td>
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<td>5.</td>
<td>Temperature should state “not to exceeded 32°” instead of “less than 32°”</td>
<td>DPNR corrected language in the table.</td>
</tr>
<tr>
<td>6.</td>
<td>“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.” Comment: AND? OR? The same question for Class C.</td>
<td>The “and/or” statement within the bacteria criteria is language that was approved in the 2010 Revision of the VI WQS; DPNR will clarify this during its next WQS revision cycle.</td>
</tr>
<tr>
<td>7.</td>
<td>“Not to exceed 50 mg/l in any coastal waters” Comment: Guessing that it should be 50 micrograms per liter (ug/l)</td>
<td>DPNR corrected the unit in the table.</td>
</tr>
<tr>
<td>8.</td>
<td>•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 Comment: AND? OR? In any event, is there a study to correlate the maximum NTU value with the minimum Secchi depth? For the next round of WQS revisions and updates, DPNR-DEP should contemplate an update.</td>
<td>DPNR will consider this suggested language change during its next WQS revision cycle.</td>
</tr>
<tr>
<td>9.</td>
<td>Same as Class B, but no NTU standard in Rules and Regulations Comment: Should consider adding or replacing with NTU measurement.</td>
<td>DPNR will consider this suggested language change during its next WQS revision cycle.</td>
</tr>
<tr>
<td>10.</td>
<td>Identify exceedences of water quality standards Comment: If the most recent WQS are being used, that would be the recently approved 2010 version. Has DPNR-DEP updated the narrative and numeric criteria in this methodology? The data covered by this methodology would have been collected and/or acquired before the new WQS were approved; would it make more sense to use the WQQS in force during the IR data period?</td>
<td>The 2010 USVI WQS were used in making the current assessments.</td>
</tr>
<tr>
<td>11.</td>
<td>“Any data gaps that are identified will be included in the multi-year monitoring strategy for resolution.” Comment: Please provide an update to the gaps document.</td>
<td>A data gap document cannot be provided at this time. DEP intends to work on developing this document during the next Integrated Report cycle.</td>
</tr>
<tr>
<td>12.</td>
<td>Data From Other Sources Comment: Clearly articulated acceptance criteria are missing from this methodology. In their absence it is difficult to define what credible data “of high quality and of great significance” would be.</td>
<td>Agencies that were contacted to request data were asked to submit the data with the relative Quality Assurance Project Plan (QAPP). Once 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.</td>
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</tbody>
</table>
DPNR, also, intends to develop an SOP for the evaluation of secondary data which will clearly articulate acceptance criteria. That criteria once developed will be incorporated into the relative version of the Assessment Methodology during the next Integrated Report cycle.

<p>| 13. | “Presently, use support will be determined using the most current version of the US Virgin Islands water quality standards. Water quality standard revision was initiated in 2008. The revision is complete and has been adopted into the Virgin Islands Rules and Regulations as of June 2011.” Comment: See earlier comment #11 above | The 2010 USVI WQS were used in making the current assessments. |
| 14. | DEP received no habitat assessment data for the 2008-2009 reporting cycle. Comment: How can ALUs be assessed in the absence of habitat data? | Habitat assessment data was not assessed since data was received. |
| 15. | DEP received no biological data for the 2008-2009 reporting cycle. Comment: Please explain. | Biological data was not assessed since data was received. |
| 16. | Category 3 Comment: In the absence of sufficient monitoring data, habitat and biological assessment data, most waters not already listed in 303(d) for known impairments will fall into this category. This statement also appeared in the 2008 methodology. What is DPNR-DEP planning to do to remediate this? | Category 3 is an USEPA Category; DPNR recently developed a Corrective Action Plan which outlined DPNR’s intentions to complete its full complement of monitoring for the next reporting period. DPNR will continue to work with USEPA’s Monitoring Branch to expand its monitoring efforts in the future. |
| 17. | 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. Comment: Usability and data quality criteria are missing from this methodology, as was the case for the 2008 document. | DPNR has incorporated the recommended usability and data quality criterion into the 2010 Assessment Methodology. The information can be found in the Evaluation of Internal Data and Data From Other Sources sections. DPNR intends to continue to evaluate and improve upon the data quality criterion during the next Integrated Report cycle. |
| 18. | “The US Virgin Islands has not identified any freshwater with designated uses or established water quality standards for freshwaters.” Comment: The U.S. VI has narrative water quality standards (to meet generally accepted aesthetic qualifications and to support diversified aquatic life) for all waters of the U.S. VI including, but not limited to streams, lakes, ponds, | DPNR has revised this section of the Assessment Methodology to clarify that freshwaters are included within the definition of “Waters of the VI” and as such these waters are covered by the VI Water Quality Standards. |</p>
<table>
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<tbody>
<tr>
<td>19.</td>
<td>“Class “B” (aquatic life and primary contact recreation).”</td>
<td>The language suggested has been incorporated.</td>
</tr>
<tr>
<td></td>
<td>Comment: For maintenance and propagation of desirable species of aquatic life.</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>“(iii) All non-marine waters defined as all Virgin Islands waters shoreward of the mean high-tide line”</td>
<td>The 2010 USVI WQS were used in making the current assessments.</td>
</tr>
<tr>
<td></td>
<td>Comment: Please note that section (iii) was added to the WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</td>
<td></td>
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<td>21.</td>
<td>“Class “C” (aquatic life and primary contact recreation).”</td>
<td>The language suggested has been incorporated.</td>
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<tr>
<td></td>
<td>Comment: For maintenance and propagation of desirable species of aquatic life.</td>
<td></td>
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<td>22.</td>
<td>(2) St. Croix: (A) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.</td>
<td>The 2010 USVI WQS were used in making the current assessments.</td>
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<td></td>
<td>Comment: Please note that the highlighted language was added to the WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</td>
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<tr>
<td>23.</td>
<td>(B) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.</td>
<td>The 2010 USVI WQS were used in making the current assessments.</td>
</tr>
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<td></td>
<td>Comment: Please note that the highlighted language was added to WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</td>
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<td>24.</td>
<td>(3) St. John: (A) Enighed Pond Bay</td>
<td>The 2010 USVI WQS were used in making the current assessments.</td>
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<td></td>
<td>Comment: Please note that this Bay was added to Class C waters during the most recent triennial WQS review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</td>
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<td>25.</td>
<td>“Not less than 5.5 mg/l from other than natural sources.”</td>
<td>DPNR corrected this statement and replaced the word “sources” with “conditions”.</td>
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<tr>
<td></td>
<td>Comment: Change “sources” to “conditions”</td>
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<td>26.</td>
<td>“Not less than 5.0 mg/l”</td>
<td>The language suggested has been incorporated.</td>
</tr>
<tr>
<td></td>
<td>Comment: Add “from other than natural conditions”</td>
<td></td>
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<tr>
<td>27.</td>
<td>“Less than 32° Celsius”</td>
<td>The language suggested has been incorporated.</td>
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<tr>
<td></td>
<td>Comment: Change to “Not to exceed 32 deg C at any time”</td>
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<tr>
<td>28.</td>
<td>“Not to exceed 70 fecal coliforms per 100 ml by MF or MPN count”</td>
<td>The language suggested has been incorporated.</td>
</tr>
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| 29. | “Not to exceed 200 fecal coliforms per 100 ml by MF or MPN count”  
Comment: Add “A geometric (log) mean of 200” | The language suggested has been incorporated. |
| 30. | “Not to exceed 50 mg/l in any coastal waters”  
Comment: Change “mg/l” to “ug/l” | The language suggested has been incorporated. |
| 31. | “Class A and B water bodies should not exceed 70 colonies/100mL in a single sample. Class C water bodies should not exceed 200 colonies/100mL in a single sample.”  
Comment: Assessment is more stringent than standard which refers to geometric mean of 70 and 200 col/100mL of FC in class B and C waters, respectively. | The language suggested has been incorporated. |
| 32. | “1. Fully Supporting: None of the Samples exceed 70 or 200 colonies/100 mL respectively for fecal coliform and 104 colonies/100 mL for enterococci.  
2. Not supporting: Any of the Samples exceed 70 or 200 colonies/100 mL respectively for fecal coliform and 104 colonies/100 mL for enterococci.”  
Comment: Add “in class B and C waters” | The language suggested has been incorporated. |
| 33. | **Toxicant Assessment**  
“The US Virgin Islands currently has no water quality standards for toxicants. The US Virgin Islands does intend to, however, use the federally recommended limits. The conditions for use support are as follows:”  
Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version). | The language suggested has been incorporated. |
| 34. | “1. Fully Supporting: No toxicants noted in either acute or chronic tests compared to controls or reference conditions.”  
Comment: How are reference conditions are established? | DPNR currently does not have formal criteria for the establishment of reference conditions. DPNR will continue to work closely with USEPA Monitoring Branch to develop these criteria. |
| 35. | “Determination of Aquatic Life Use Support will consider habitat assessment data (based on availability) in relation to propagation of desired species of marine life.”  
Comment: If this assessment is being done based on 2010 WQS Regulations; please note that the new VIWQS include narrative bio-criteria for class B and C waters. In addition, “exotic or aquatic nuisance species” were added to the list of substances from which waters should be free. | The language suggested has been incorporated to ensure conformity with the 2010 USVI WQS. |
| 36. | **Toxicity Assessment** | The language suggested has been incorporated to ensure conformity with the 2010 USVI WQS. |
“The conditions for use support are as follows:
1. Fully Supporting: No toxicity noted in either acute or chronic tests compared to controls or reference conditions.
2. Partially Supporting: No toxicity noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.
3. Not Supporting: Toxicity noted in many tests and occurs frequently.”

Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version).

<table>
<thead>
<tr>
<th>37.</th>
<th><strong>Conventional Assessment</strong></th>
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| “The conventional parameters are:  
Dissolved Oxygen, Temperature, Turbidity, and pH” | DPNR will work to develop criteria for evaluating “natural conditions” during the next Triennial Review Process. |

Comment: VIWQS states that DO may not be less than 5.5 or 5.00 mg/L unless it is shown to be natural condition. How “natural condition” is being evaluated for class B and C waters?

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<th>38.</th>
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<tr>
<td>Comment: VIWQS state that temperature, as a result of waste discharge, may not be greater than 1 deg C above natural. How “natural” temperature is being evaluated for class B and C waters?</td>
<td>DPNR will work to develop criteria for evaluating “natural conditions” during the next Triennial Review Process.</td>
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<tr>
<th>39.</th>
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<tbody>
<tr>
<td>“Considerations will be made for toxicants data (based on availability). The US Virgin Islands currently has no water quality standards for toxicants.”</td>
<td>The language suggested has been incorporated.</td>
</tr>
</tbody>
</table>

Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version).
### Biological Assessment

“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.”

**Comment:** What thresholds are being used for assessment of biological indices? Are they different for different water classes?

DPNR continues to work towards the development of Biological Assessment Criteria. The 2010 WQS states:

(b) 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.

### Biological Assessment

“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.”

**Comment:** How are reference conditions determined for classes A, B, and C waters?

DPNR intends to develop criteria for reference conditions. This process is being evaluated through the Nutrient Criteria Development Process. Once the criteria are developed it would be incorporated into the WQS Revision Process.

DPNR expect to continue its work towards the development of numerical criteria by the next Integrated Report cycle.

### Listing Rules

**Comment:** This Report does not describe how “preservation of natural phenomena” is assessed for class A waters. These outstanding natural resource waters cannot be altered except towards natural conditions. It would be helpful to include description how it is being done.

DPNR through its monitoring efforts continues to assess whether degradation is occurring in the Class A waters.