Piankatank River Shellfish TMDLs

Impaired due to Bacteria – A Review for Implementation Planning

First Public Meeting

May 23, 2012
Hartfield, VA

DCR
Virginia Department of Conservation & Recreation

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Photo Credit: http://marinas.com/view/overview/1517_Wilton_Creek_Stampers_VA_United_States

What is a TMDL?

TMDL = Total Maximum Daily Load = maximum amount of a pollutant that can exist in a water body without violating water quality standards (WQS)

AKA "Pollution Diet"

WQS = numeric or narrative limits on pollutants that ensure the protection of human health and of aquatic life

****Shellfish use standard is protective of human health****

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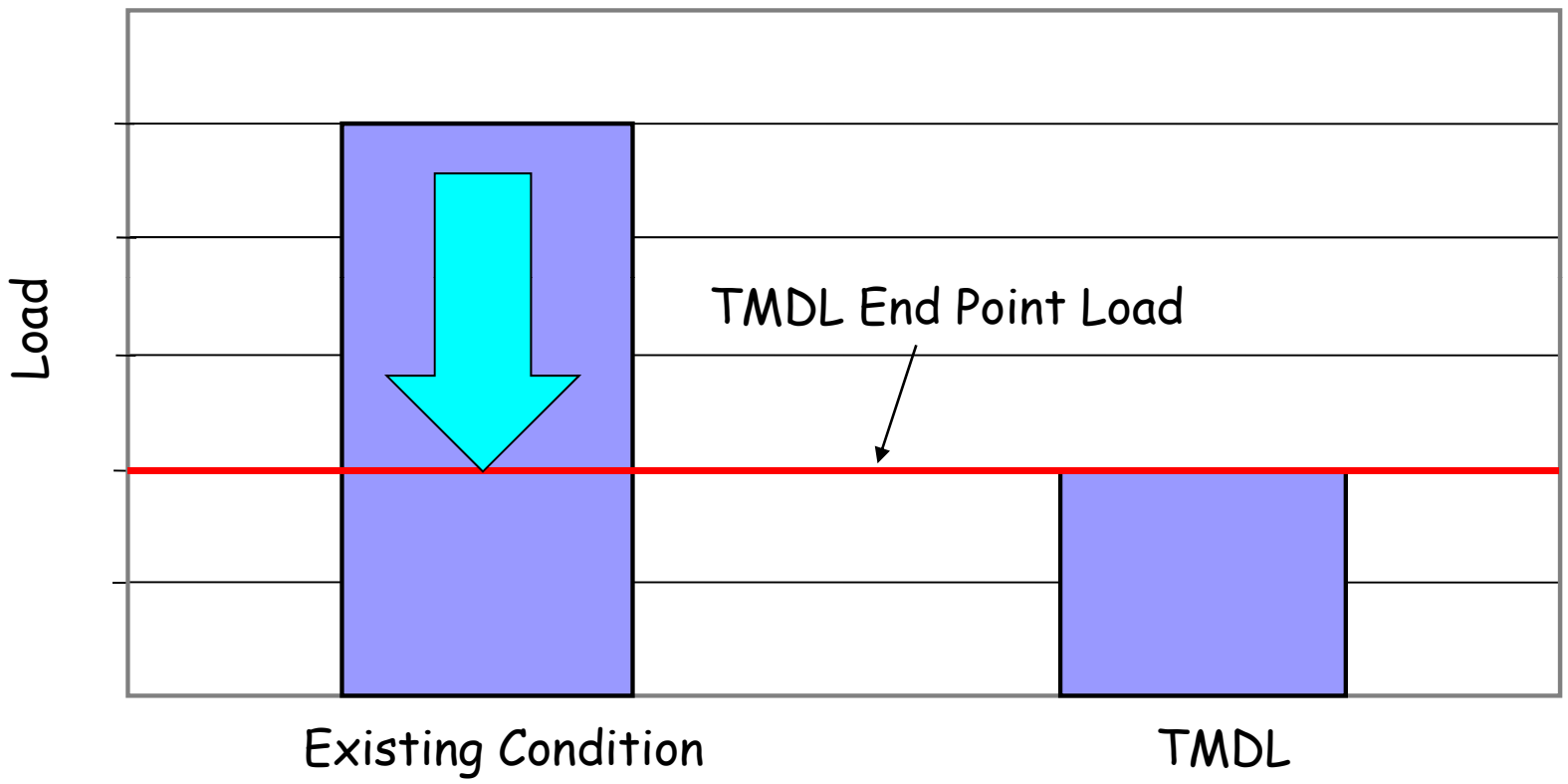
A Visual Example of a TMDL…



Reducing existing bacteria load to the TMDL end point load is expected to restore water quality.

Why are TMDL studies necessary?

- TMDLs must be developed for water bodies that do not meet water quality standards (impaired waters – 303d list)
- Impaired waters occur throughout Virginia in lakes, streams, and tidal waters
  - Most of VA's impairments = Bacteria
  - Shellfish impairments are discovered via monitoring performed by VDH = +3000 stations monthly (FC) (also public beaches - recreational use)
  - DEQ monitors on a 6-year rotational schedule for a variety of pollutants, including recreational (EC, ENT) use of state waters
- TMDLs are developed and approved by EPA and State Water Control Board (SWCB)

Fecal Coliform (FC), E.coli (EC), and Enterococci (ENT) are indicator organisims

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Shellfish TMDLs Completed…

- "Piankatank River & Harper Ck" - 6/2006

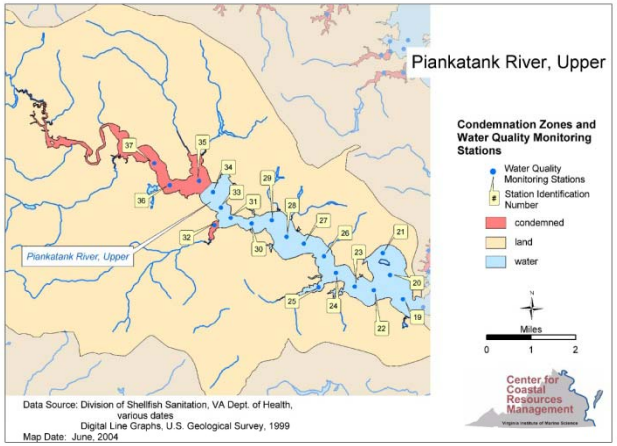
  Essex, Gloucester, King & Queen, Middlesex

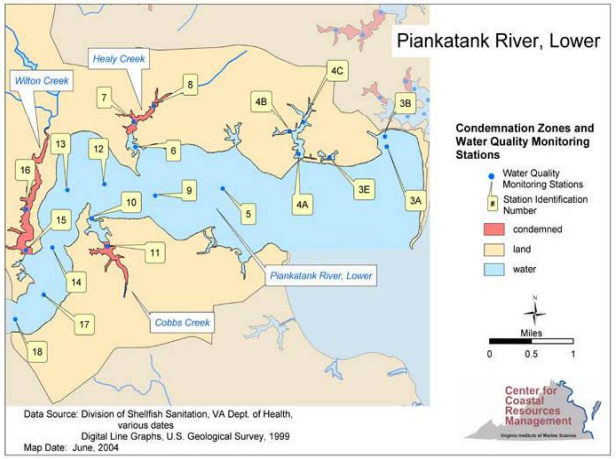
- "Piankatank River, Lower" – Wilton, Cobbs, and Healy Cks - 11/2005

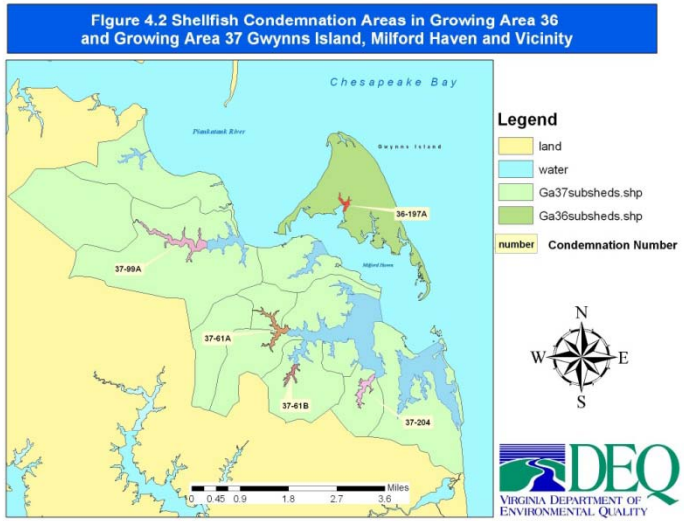
  Middlesex and Mathews

- "Gwynns Island and Milford Haven" – Queens, Edwards, Stutts, Morris, Billups Cks - 1/2008

  Mathews

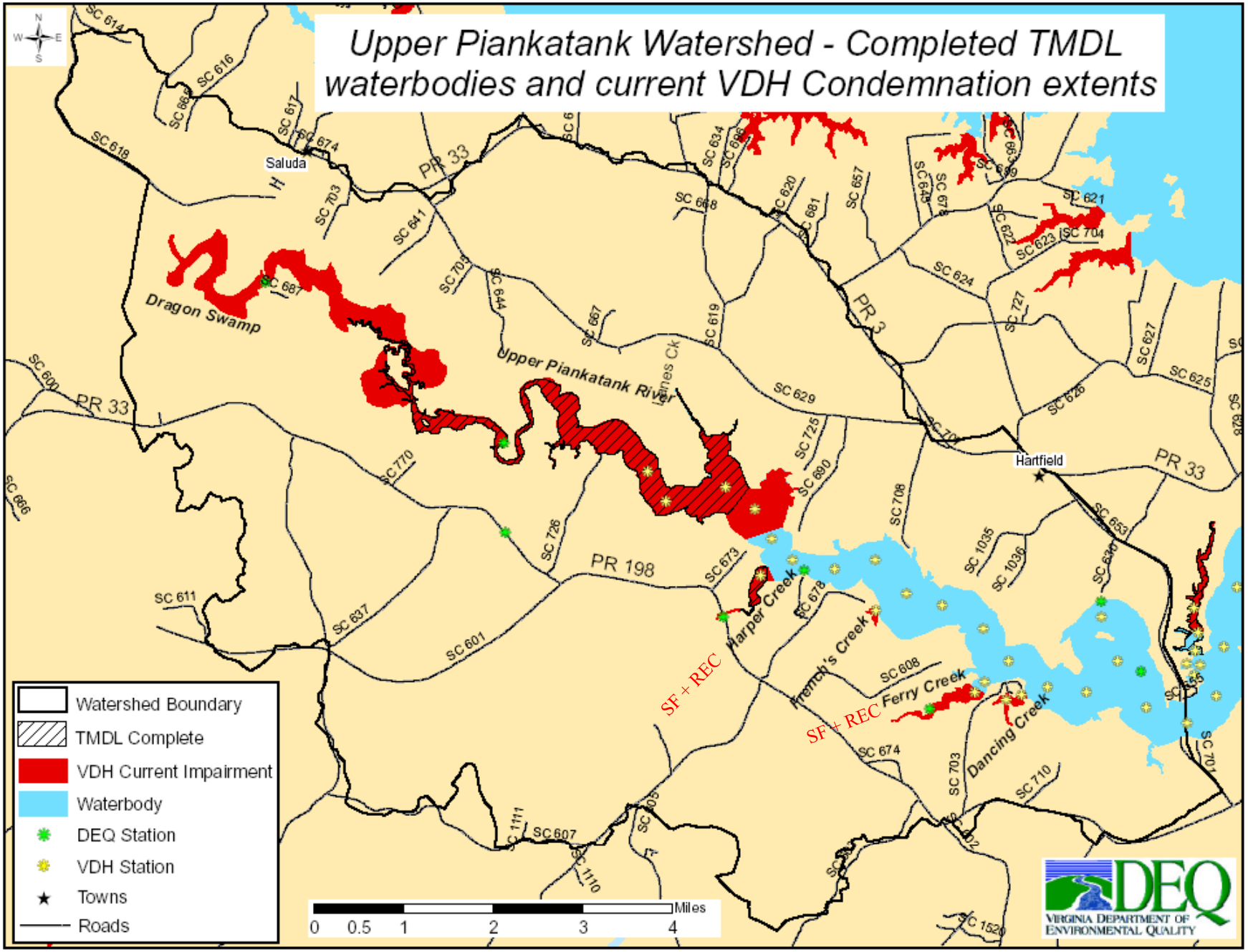


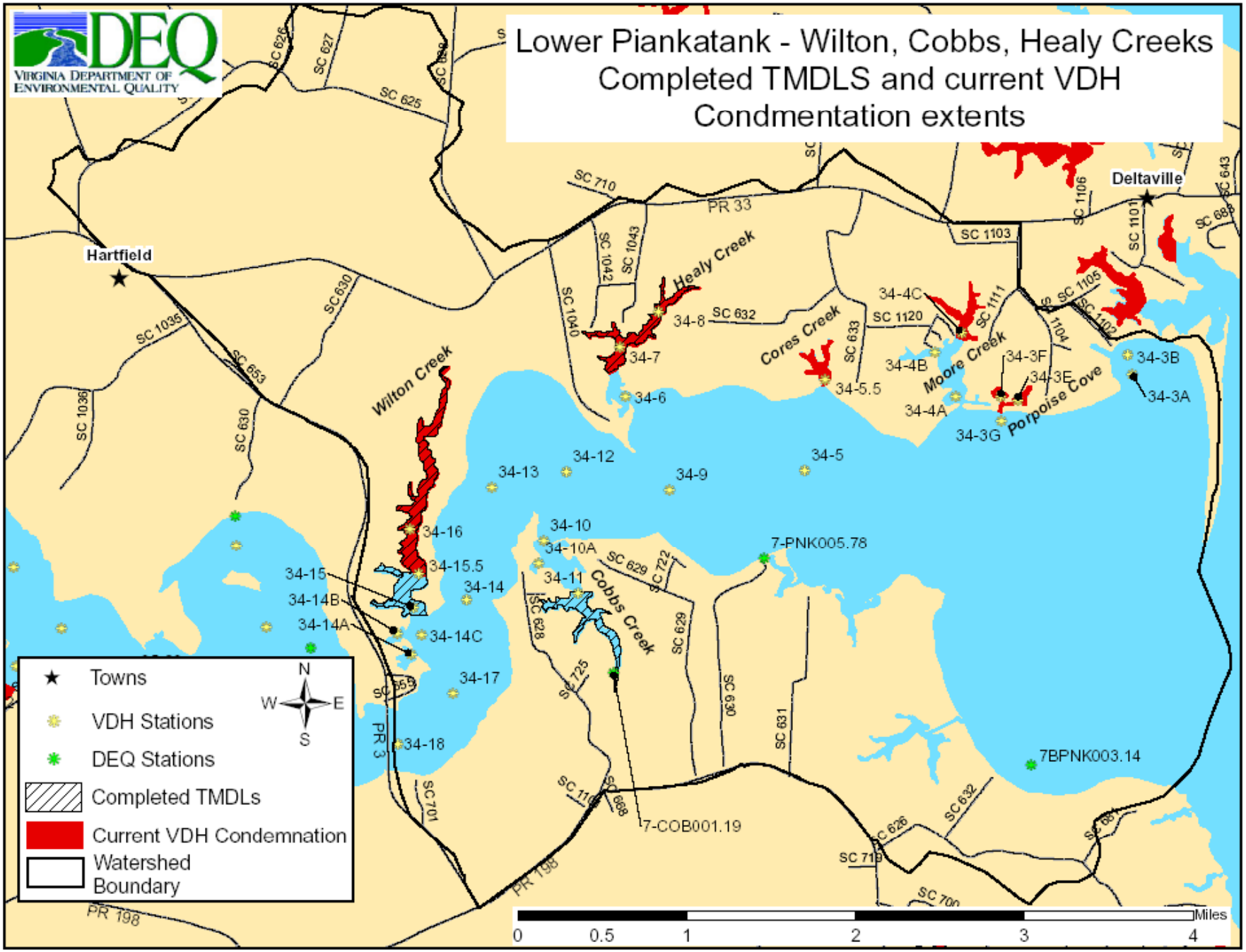




From Approved Reports – link below

http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/ApprovedTMDLReports.aspx


Upper Piankatank Watershed - Completed TMDL waterbodies and current VDH Condemnation extents
Saluda
Hartfield
Dragon Swamp
Upper Piankatank River
Harper Creek
French's Creek
Ferry Creek
Dancing Creek
SF + REC
SF + REC
PR 33
PR 198
PR 3
Watershed Boundary
TMDL Complete
VDH Current Impairment
Waterbody
DEQ Station
VDH Station
Towns
Roads
Miles
0 0.5 1 2 3 4
DEQ
Virginia Department of Environmental Quality


Lower Piankatank - Wilton, Cobbs, Healy Creeks
Completed TMDLS and current VDH
Condmentation extents
DEQ
Virginia Department of Environmental Quality
Hartfield
Deltaville
Wilton Creek
Healy Creek
Cores Creek
Moore Creek
Porpoise Cove
Cobbs Creek
34-3A
34-3B
34-3E
34-3F
34-3G
34-4A
34-4B
34-4C
34-5
34-5.5
34-6
34-7
34-8
34-9
34-10
34-10A
34-11
34-12
34-13
34-14
34-14A
34-14B
34-14C
34-15
34-15.5
34-16
34-17
34-18
7-PNK005.78
7BPNK003.14
7-COB001.19
Towns
VDH Stations
DEQ Stations
Completed TMDLs
Current VDH Condemnation
Watershed Boundary
N
W
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S
0
0.5
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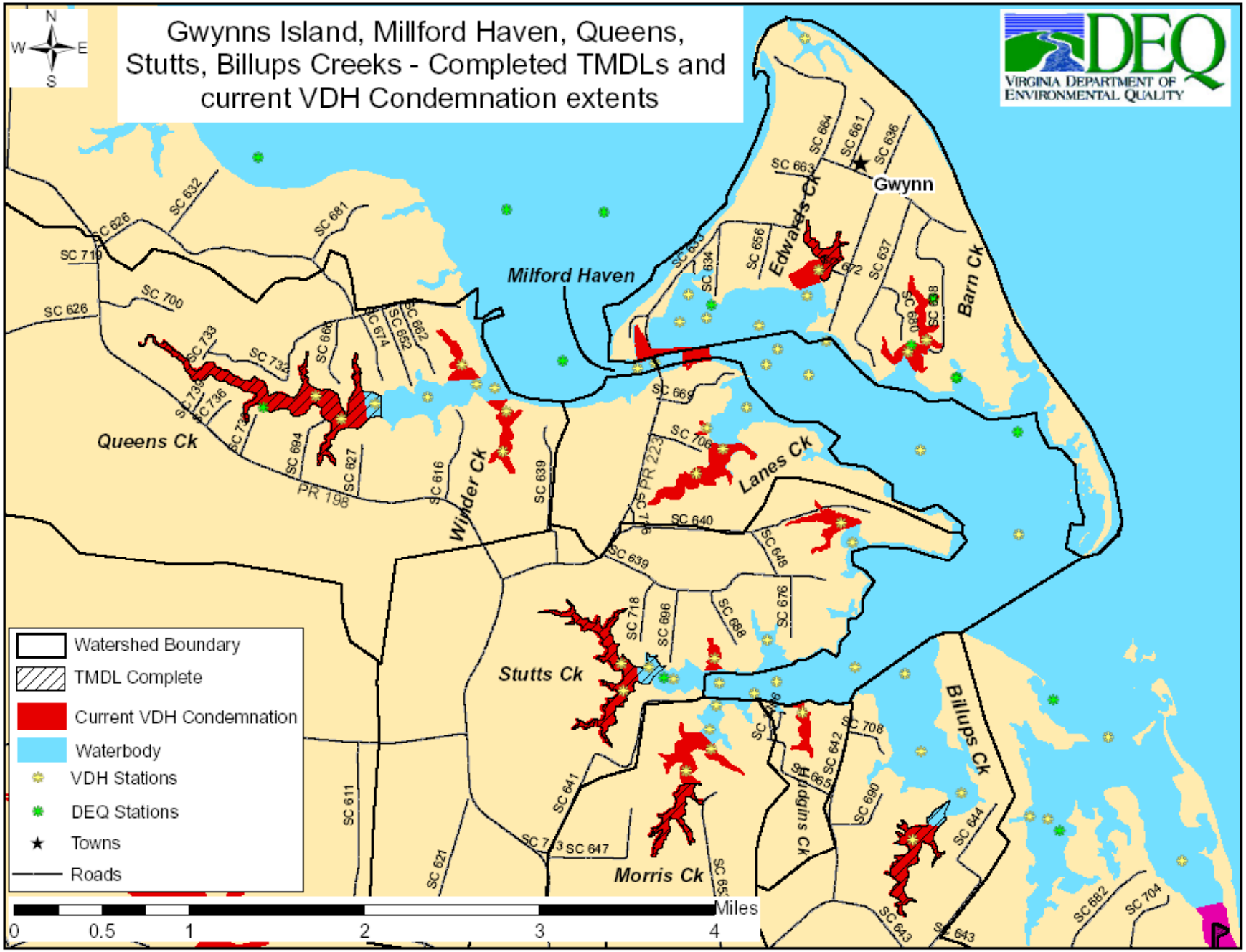
Miles


Gwynns Island, Millford Haven, Queens, Stutts, Billups Creeks - Completed TMDLs and current VDH Condemnation extents
DEQ
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N
W
E
S
Gwynn
Milford Haven
Edwards Ck
Barn Ck
Queens Ck
Winder Ck
Lanes Ck
Stutts Ck
Morris Ck
Hodgins Ck
Billups Ck
Watershed Boundary
TMDL Complete
Current VDH Condemnation
Waterbody
VDH Stations
DEQ Stations
Towns
Roads
0
0.5
1
2
3
4
Miles

From TMDL report

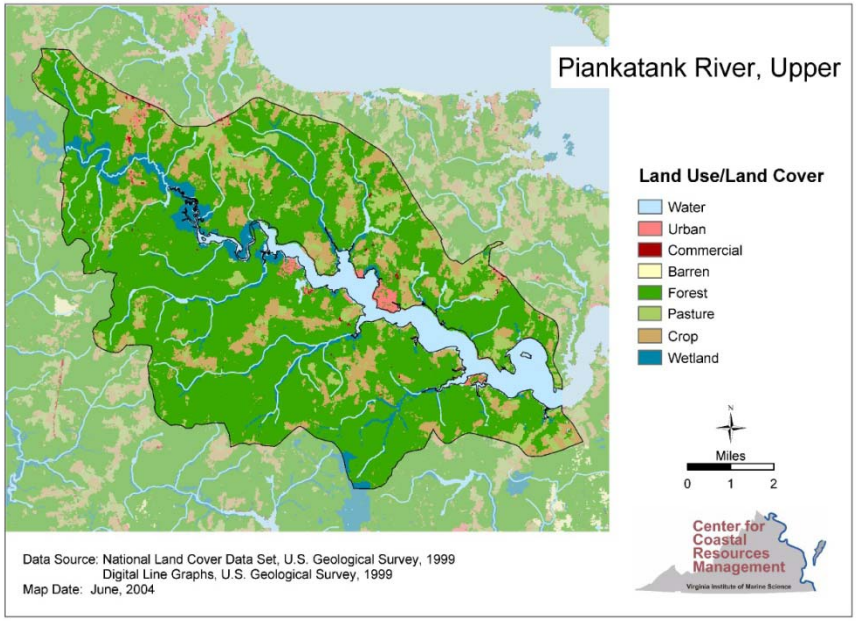
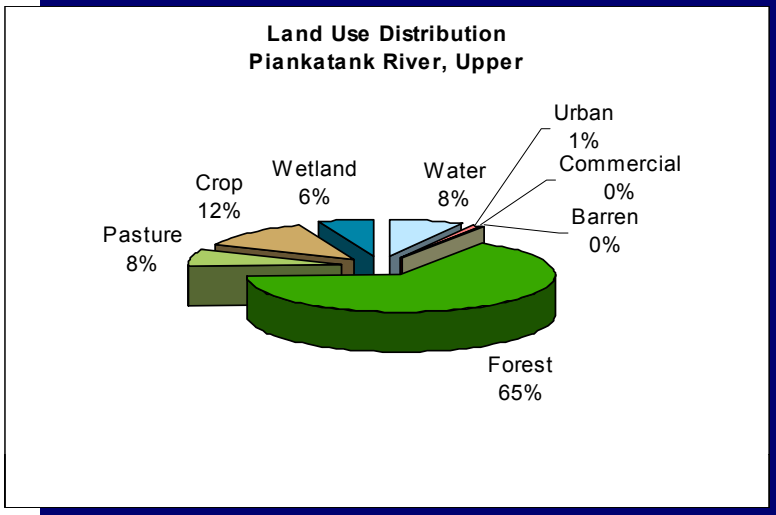


Figure 3.1



L+H+P = 70%

L+H+P = 81%

Condemnation Area	Source	BST Allocation % of Total Load	Current Load MPN/ day	Load Allocation MPN/ day	Reduction Needed
76A Piankatank River	Livestock	32%	2.10E+11	0.00E+00	100%
	Wildlife	30%	1.97E+11	1.21E+11	39%
	Human	27%	1.77E+11	0.00E+00	100%
	Pets	11%	7.22E+10	0.00E+00	100%
	Total	**100%**	**6.56E+11**	**1.21E+11**	**81%**
76B Harpers Creek	Livestock	33%	4.39E+11	0.00E+00	100%
	Wildlife	19%	2.53E+11	2.53E+11	0%
	Human	31%	4.12E+11	0.00E+00	100%
	Pets	17%	2.26E+11	1.20E+11	47%
	Total	**100%**	**1.33E+12**	**3.73E+11**	**72%**

All loading allocated to non-point sources

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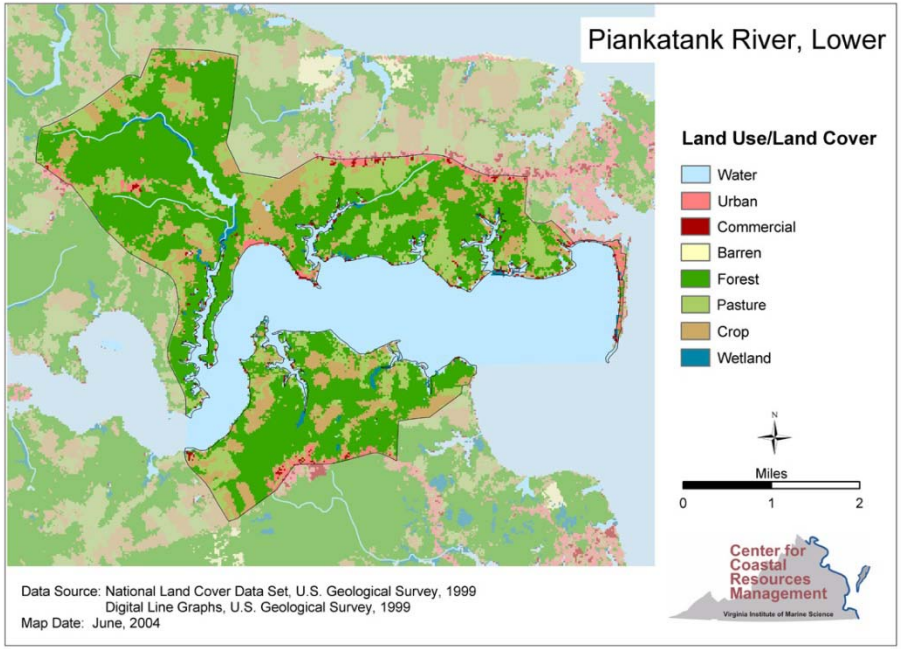
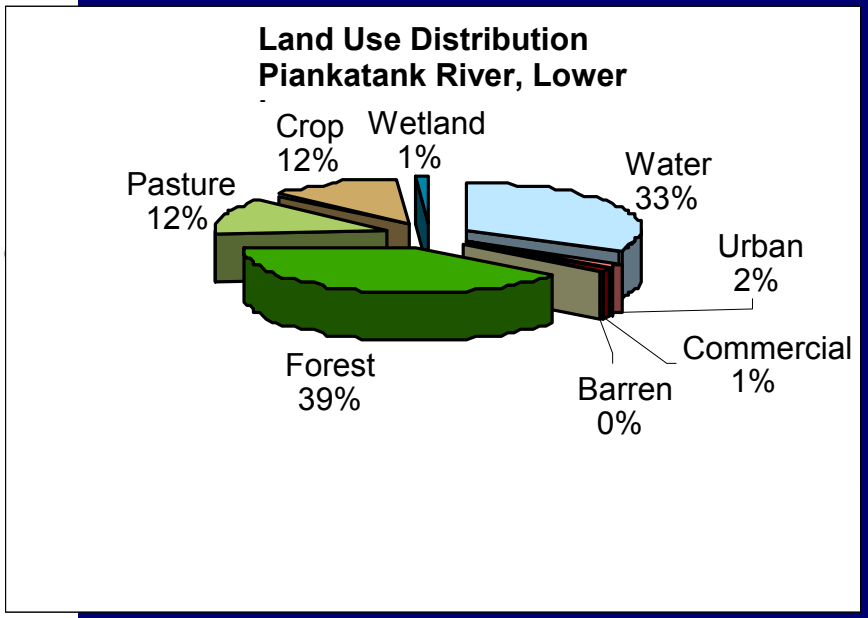
From TMDL report





L+H+P = 51%

L+H+P = 42%

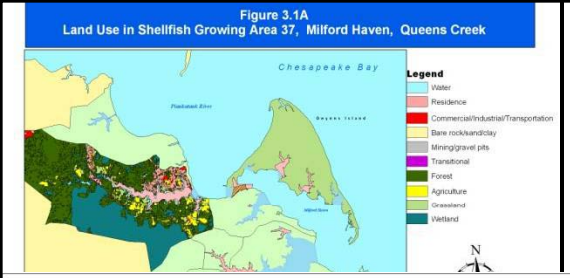
L+H+P = 72%

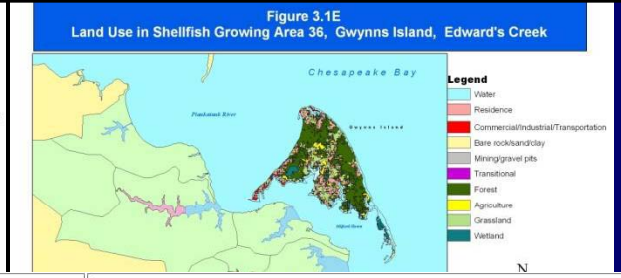
Condemnation Area	Source	BST Allocation % of Total Load	Current Load (MPN/ day)	Load Allocation (MPN/ day)	Reduction Needed
126 Wilton Creek	Livestock	24%	2.71E+11	1.94E+09	99%
	Wildlife	49%	5.58E+11	1.40E+11	75%
	Human	22%	2.47E+11	0.00E+00	100%
	Pets	5%	5.8E+10	4.14E+08	99%
	Total	**100%**	**1.13E+12**	**1.42E+11**	**87%**
129 Healy Creek	Livestock	21%	7.84E+10	2.43E+09	97%
	Wildlife	58%	2.14E+11	4.28E+10	80%
	Human	14%	5.26E+10	0.00E+00	100%
	Pets	7%	2.41E+10	7.47E+08	97%
	Total	**100%**	**3.69E+11**	**4.60E+10**	**88%**
170 Cobbs Creek	Livestock	51%	6.16E+10	1.25E+10	80%
	Wildlife	28%	3.32E+10	3.32E+10	0%
	Human	19%	2.31E+10	0.00E+00	100%
	Pets	2%	2.62E+09	5.30E+08	80%
	Total	**100.00%**	**1.21E+11**	**4.62E+10**	**62%**

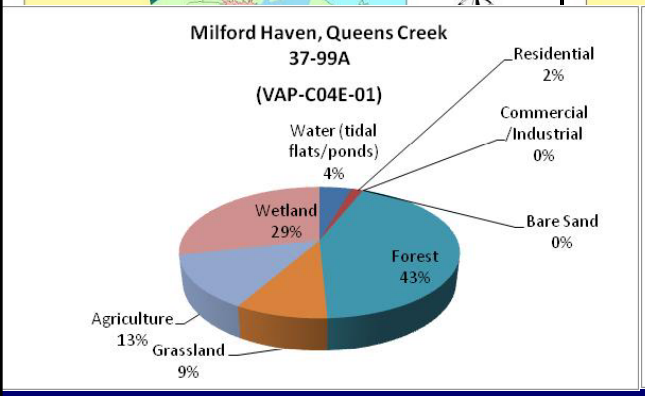
All loading allocated to non-point sources

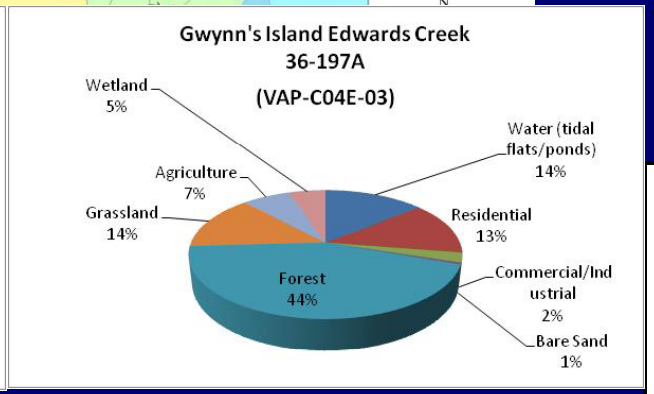
DEQ Virginia Department of Environmental Quality

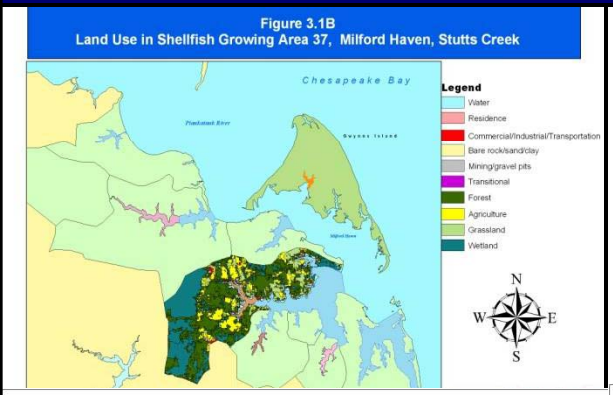
From TMDL report

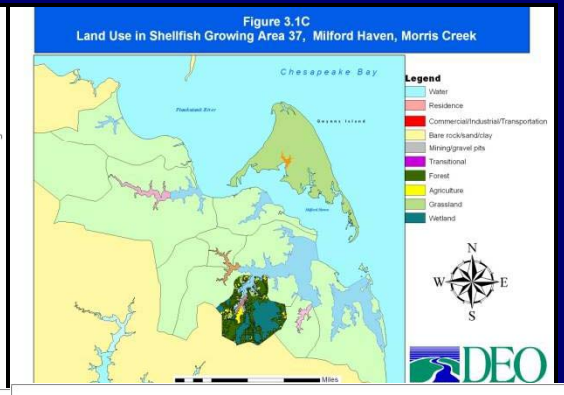


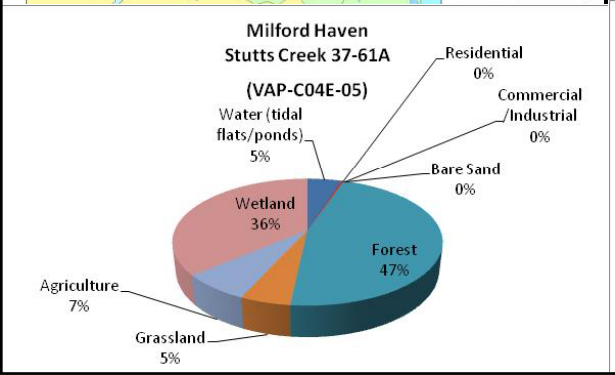


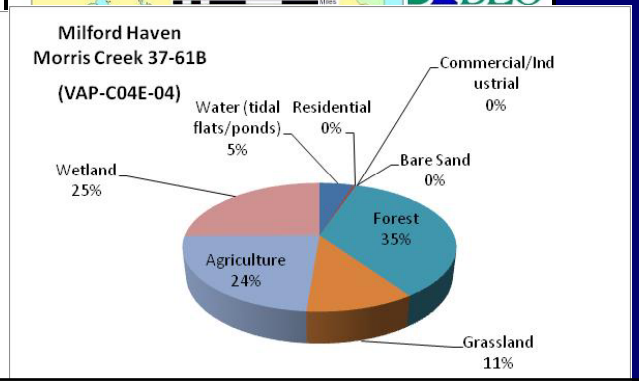


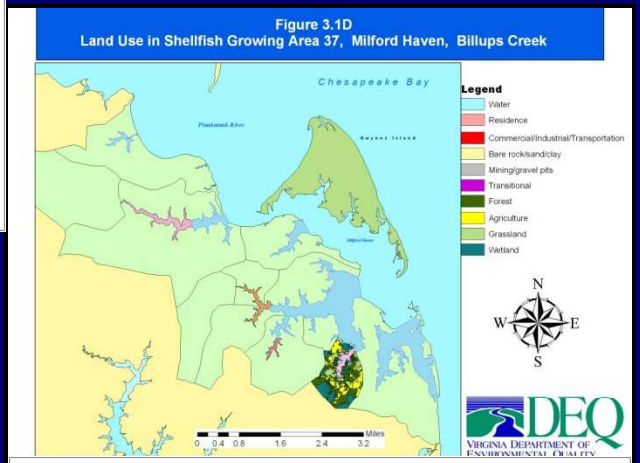


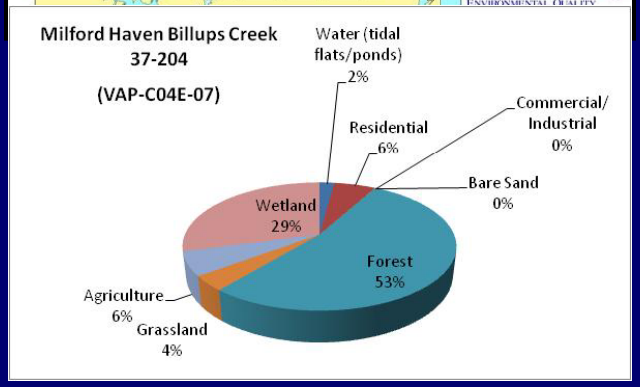












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From Gwynns Island – Milford Haven TMDL report

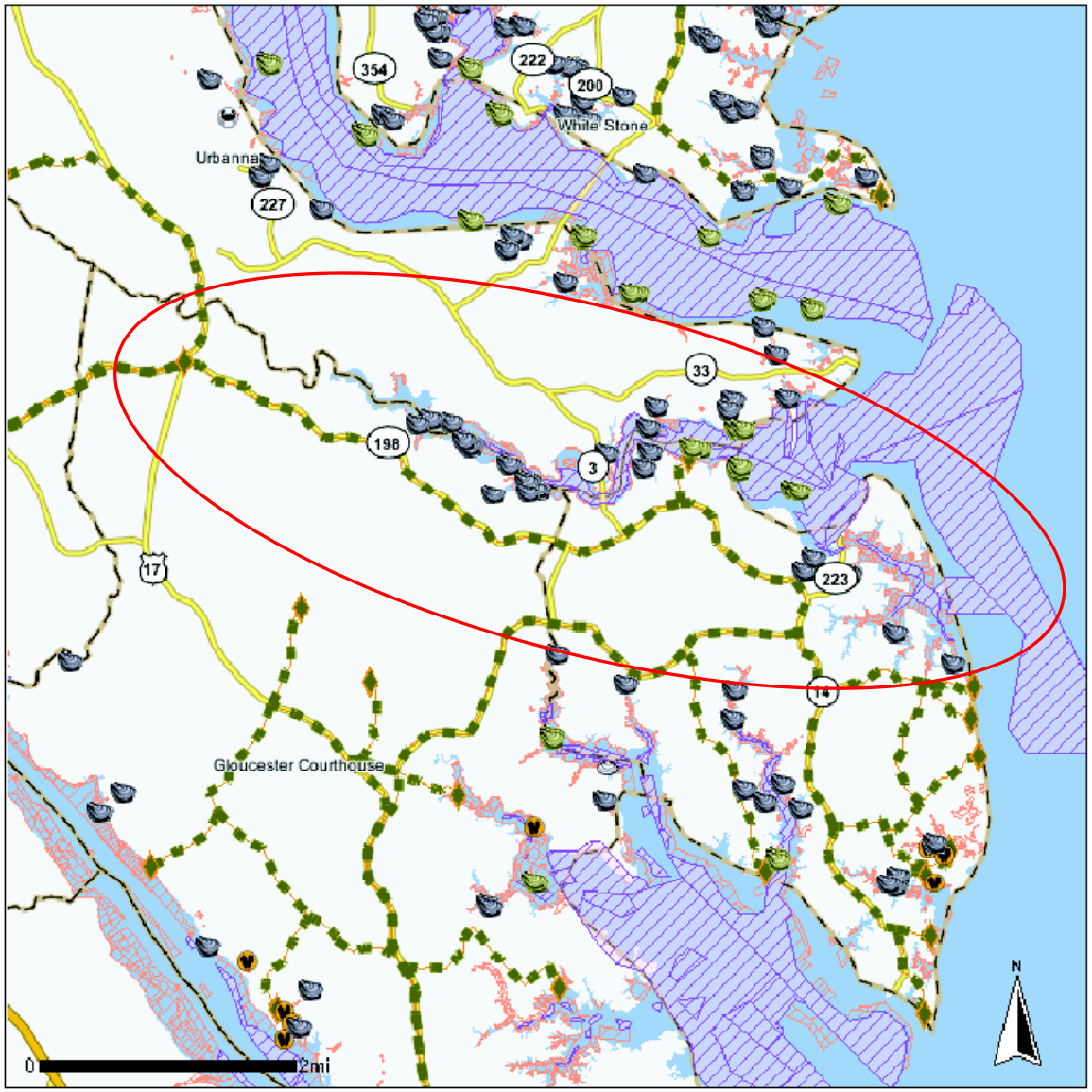
	Condemnation Area	Source	BST Allocation % of Total Load	Current Load MPN/ day	Load Allocation MPN/ day	Reduction Needed
L+H+P = 42%	36-197A Edwards Creek (VAP-C04E-03)	Wildlife	58%	4.83E+10	2.03E+10	58%
		Human	10%	8.32E+09	0.00E+00	100%
		Livestock	24%	2.00E+10	0.00E+00	100%
		Pets	8%	6.66E+09	0.00E+00	100%
		Total	**100%**	**8.32E+10**	**2.03E+10**	**76%**
L+H+P = 26%	37-99A Queens Creek (VAP-C04E-01)	Wildlife	74%	9.48E+11	1.59E+11	83%
		Human	8%	1.02E+11	0.00E+00	100%
		Livestock	9%	1.15E+11	0.00E+00	100%
		Pets	9%	1.15E+11	0.00E+00	100%
		Total	**100%**	**1.28E+12**	**1.59E+11**	**88%**
L+H+P = 44%	37-61A Stutts Creek (VAP-C04E-05)	Wildlife	45%	1.24E+11	6.69E+10	46%
		Human	13%	3.60E+10	0.00E+00	100%
		Livestock	24%	6.64E+10	0.00E+00	100%
		Pets	19%	5.26E+10	0.00E+00	100%
		Total	**100%**	**2.77E+11**	**6.69E+10**	**76%**
L+H+P = 36%	Morris Creek 37-61A (VAP-C04E-04)	Wildlife	64%	4.54E+10	1.80E+10	61%
		Human	10%	7.10E+09	0.00E+00	100%
		Livestock	11%	7.81E+09	0.00E+00	100%
		Pets	15%	1.07E+10	0.00E+00	100%
		Total	**100%**	**7.10E+10**	**1.80E+10**	**75%**
L+H+P = 72%	37-204 Billups Creek (VAP-C04E-07)	Wildlife	31%	7.25E+10	3.68E+10	49%
		Human	30%	7.01E+10	0.00E+00	100%
		Livestock	16%	3.74E+10	0.00E+00	100%
		Pets	26%	6.08E+10	0.00E+00	100%
		Total	**100%**	**2.34E+11**	**3.68E+10**	**84%**

All loading allocated to non-point sources

Virginia Coastal Zone
MANAGEMENT PROGRAM

Legend

- Baylor Grounds (Public Oyster Grounds)
- Private Oyster Leases
- State Constructed Oyster Reefs
- Commercial Shellfish Aquaculture Sites
  - Hard clam
  - Soft clam
  - Oyster
  - Crab shed
- Oyster Gardening Sites
- Seaside Oyster Density
  - None
  - Very Low
  - Low
  - Medium
  - High
- Birding & Wildlife Sites
- Birding & Wildlife Trails



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http://www.deq.state.va.us/Programs/CoastalZoneManagement/CoastalGEMSGeospatialData.aspx

Approved Report Links:

http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/ApprovedTMDLReports.aspx

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VA DEQ - Piedmont Regional TMDL Coordinator
(804)527-5124
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VDH Sanitary Shoreline Survey & Monitoring Data

http://www.vdh.virginia.gov/EnvironmentalHealth/Shellfish/closureSurvey/index.htm#DisplayMaps

This presentation to be available at:

http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLImplementation/TMDLImplementationProgress.aspx

TMDL Website:

http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL.aspx

Photo Credit: Chesapeake Woman – Life in Mathews Blog – Gwynns Island Sunset 12/2008: http://lifeinmathews.blogspot.com/2008/12/circuit-rider.html

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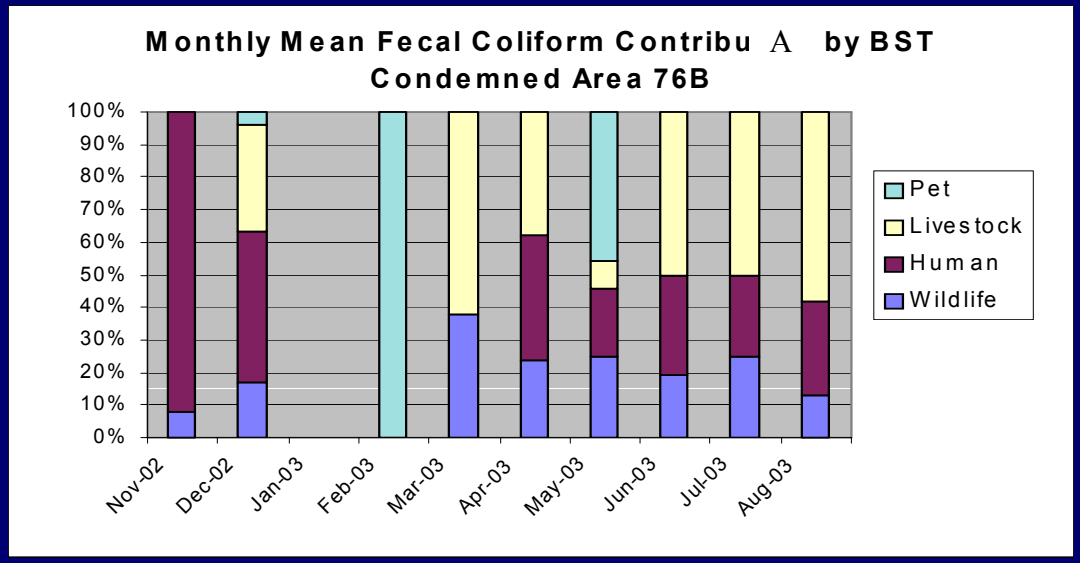
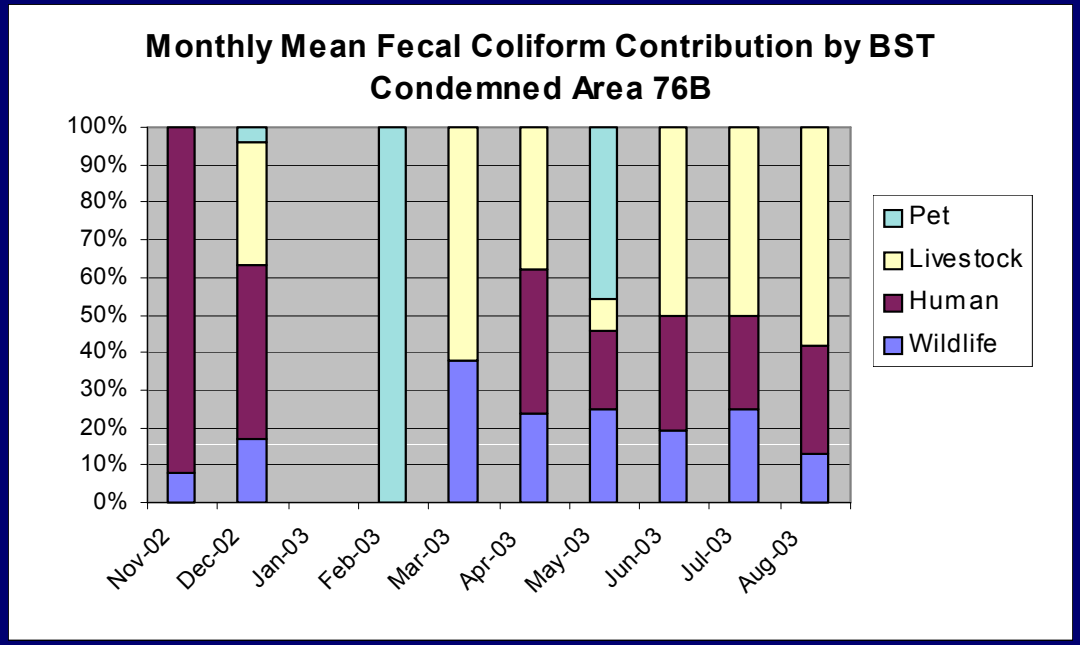
Extra Slides

BST Results Upper Piankatank



Upper Piankatank



Harper Creek

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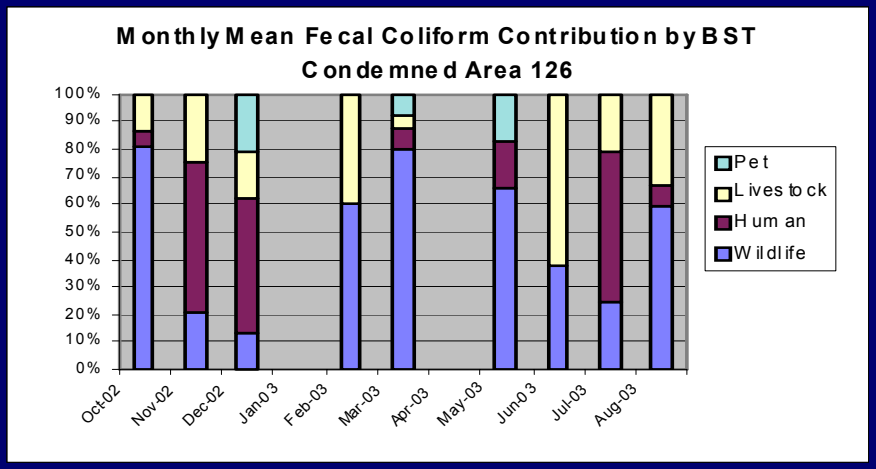
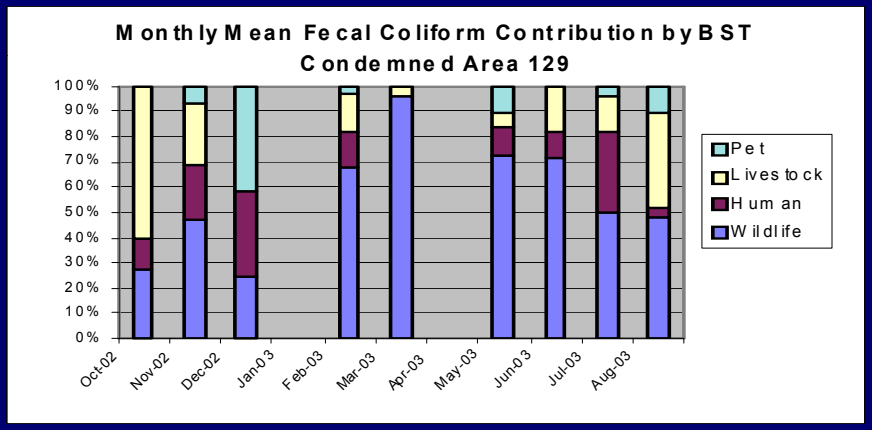
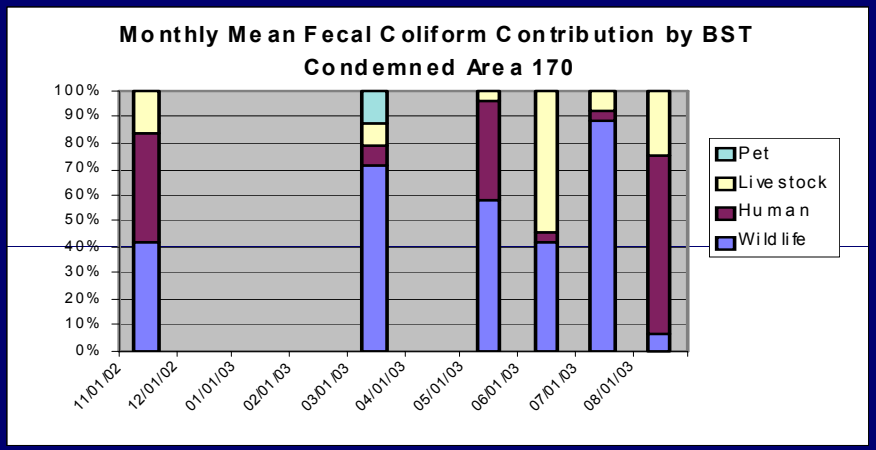
BST Results Lower Piankatank



Wilton Creek

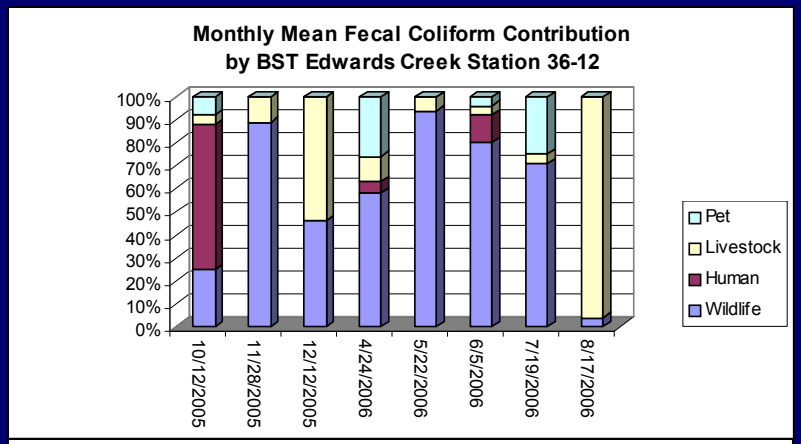


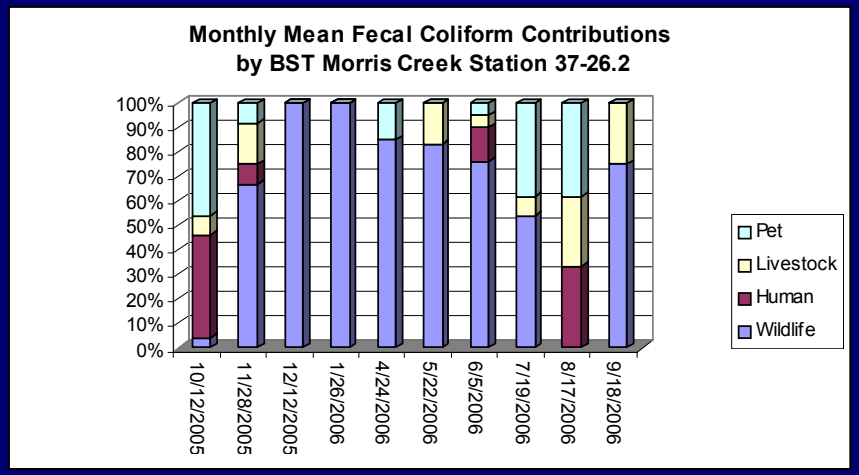
Healy Creek

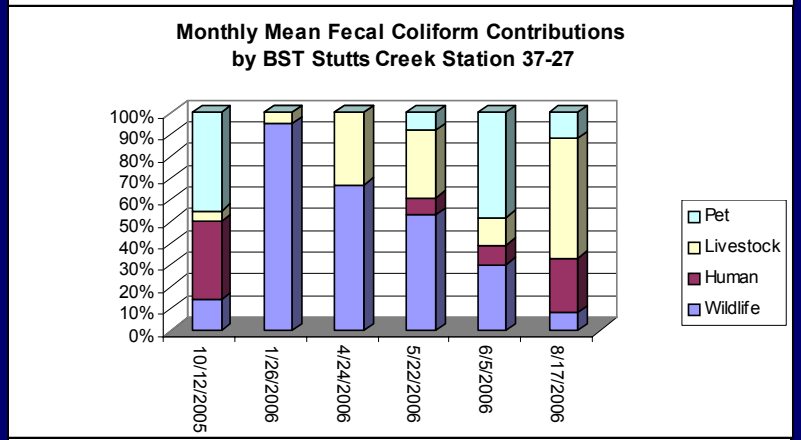


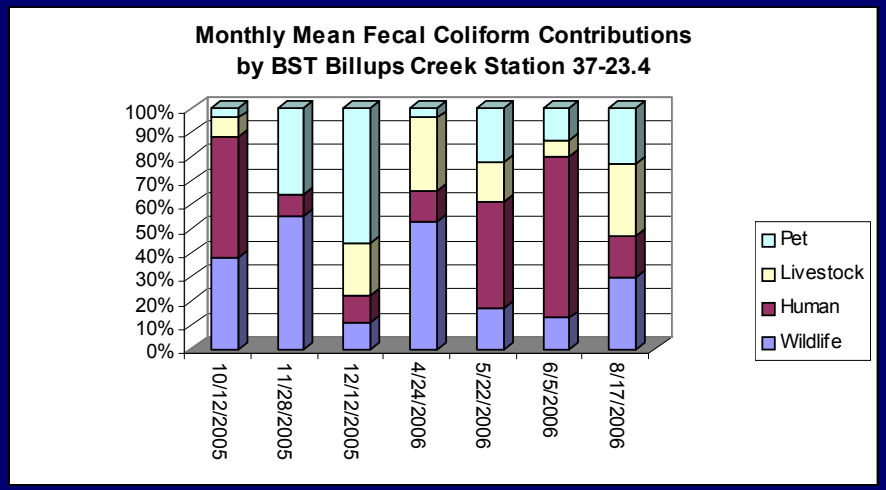
Cobbs Creek

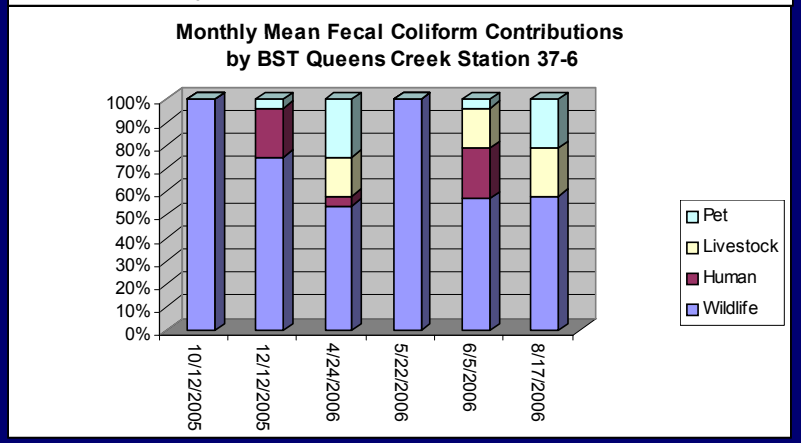
BST Results Gwynns Island and Milford Haven





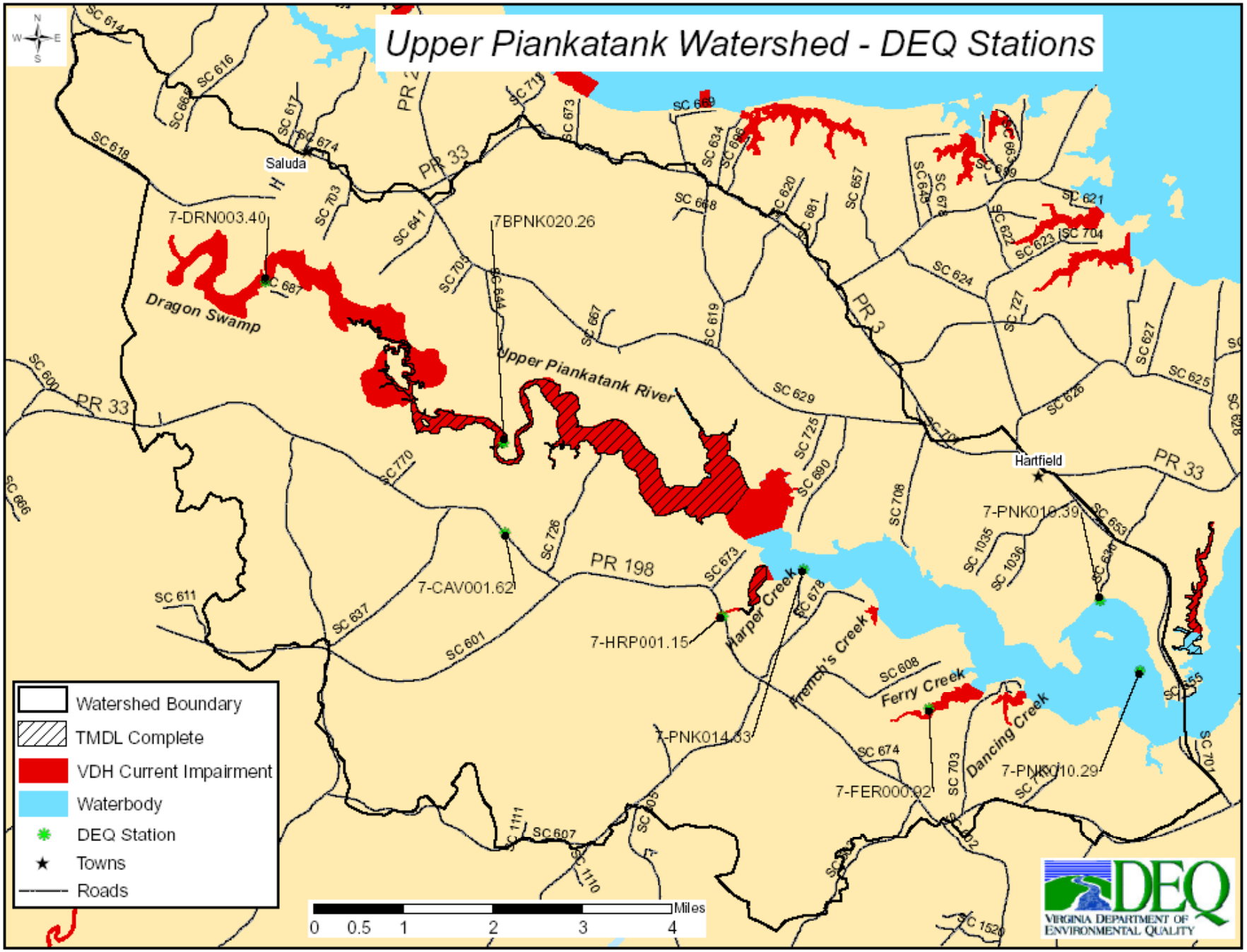


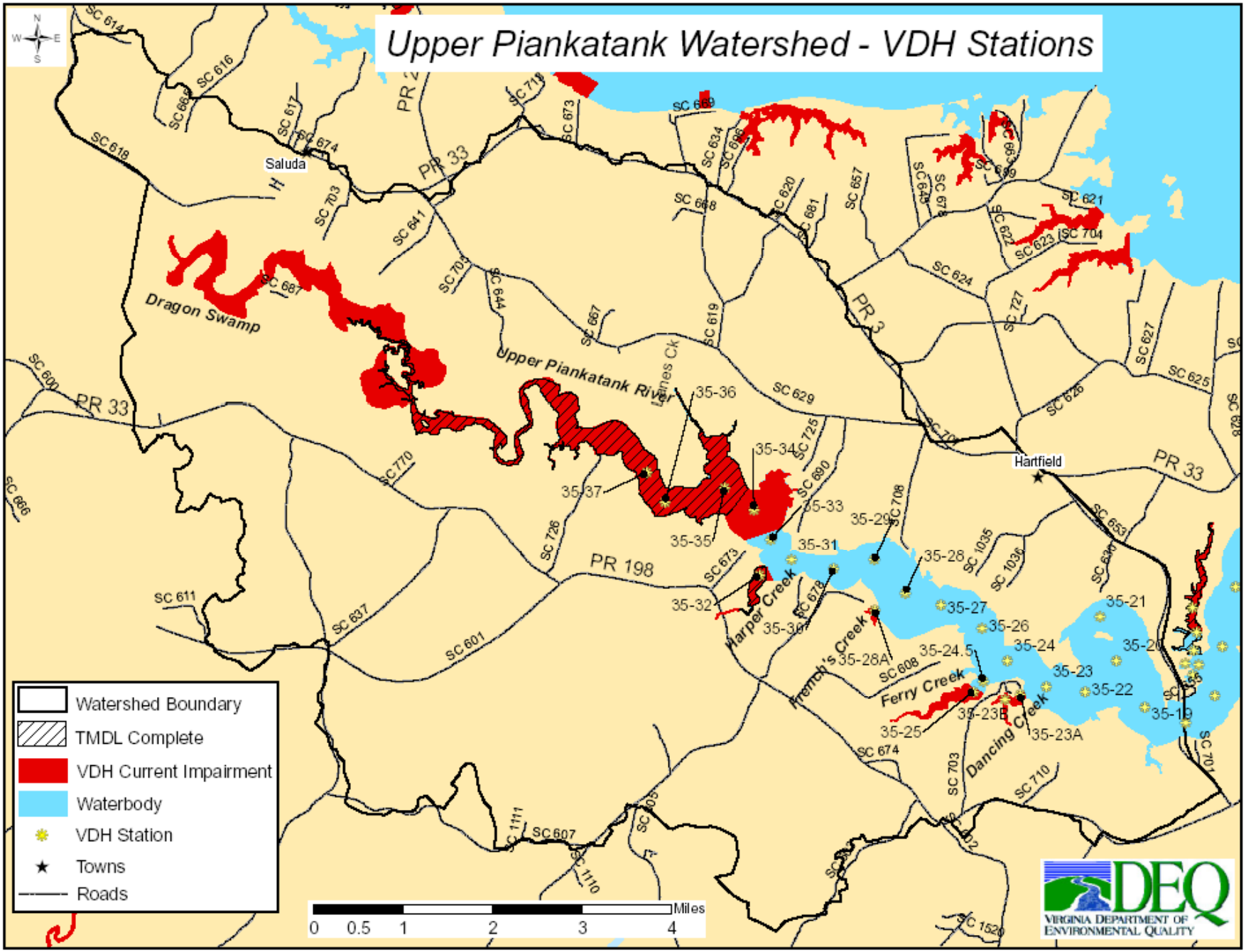


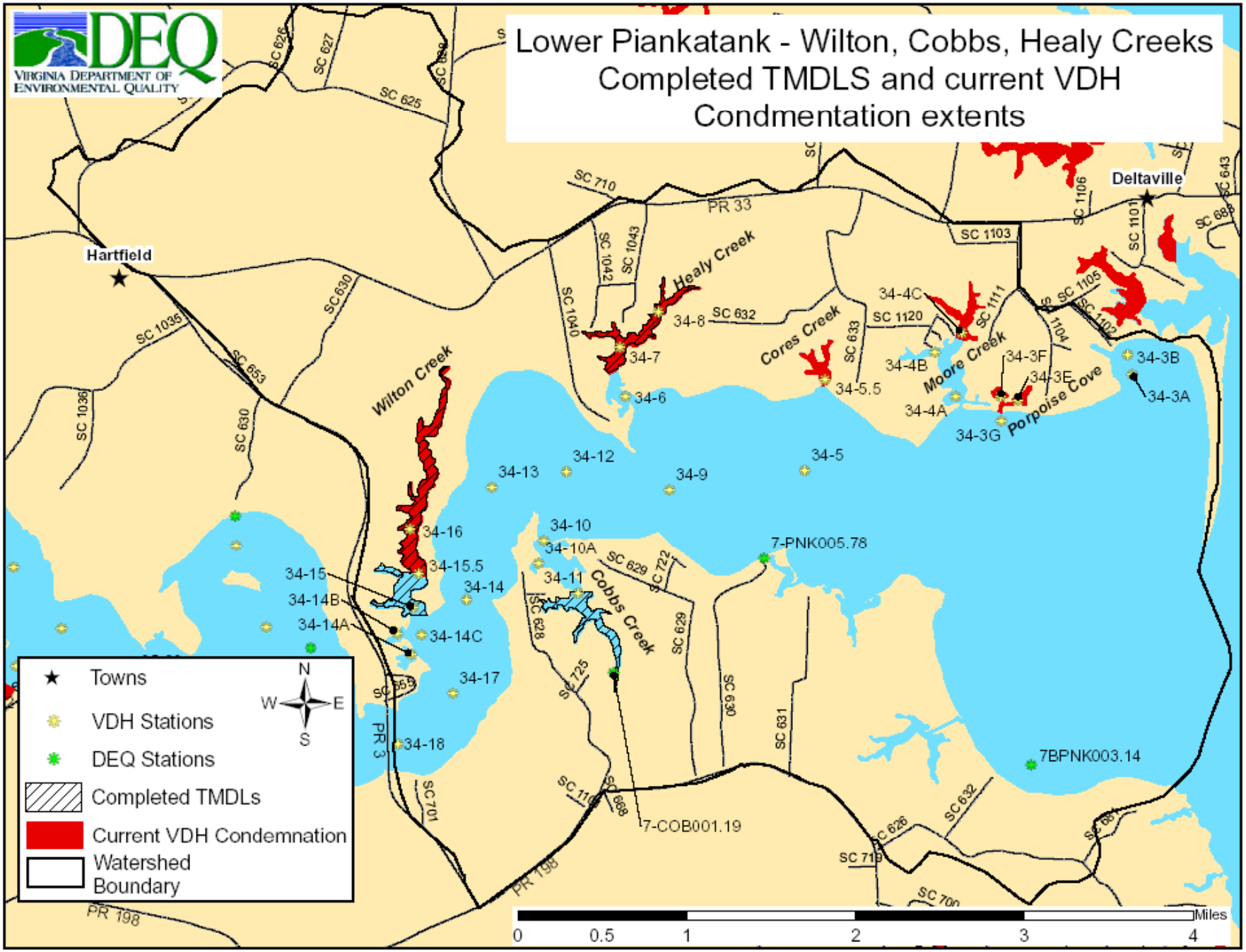


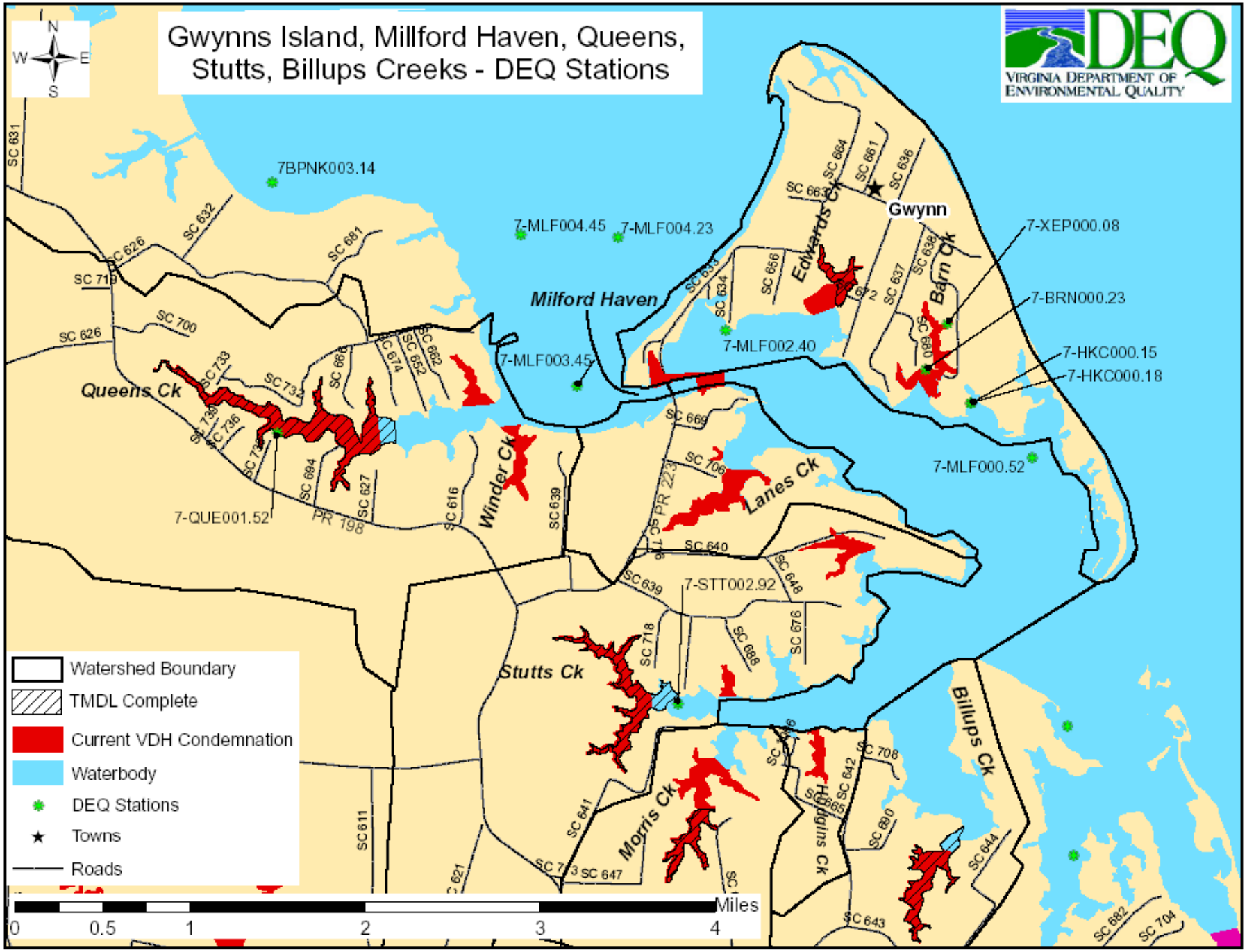
DEQ Stations – ENT Data

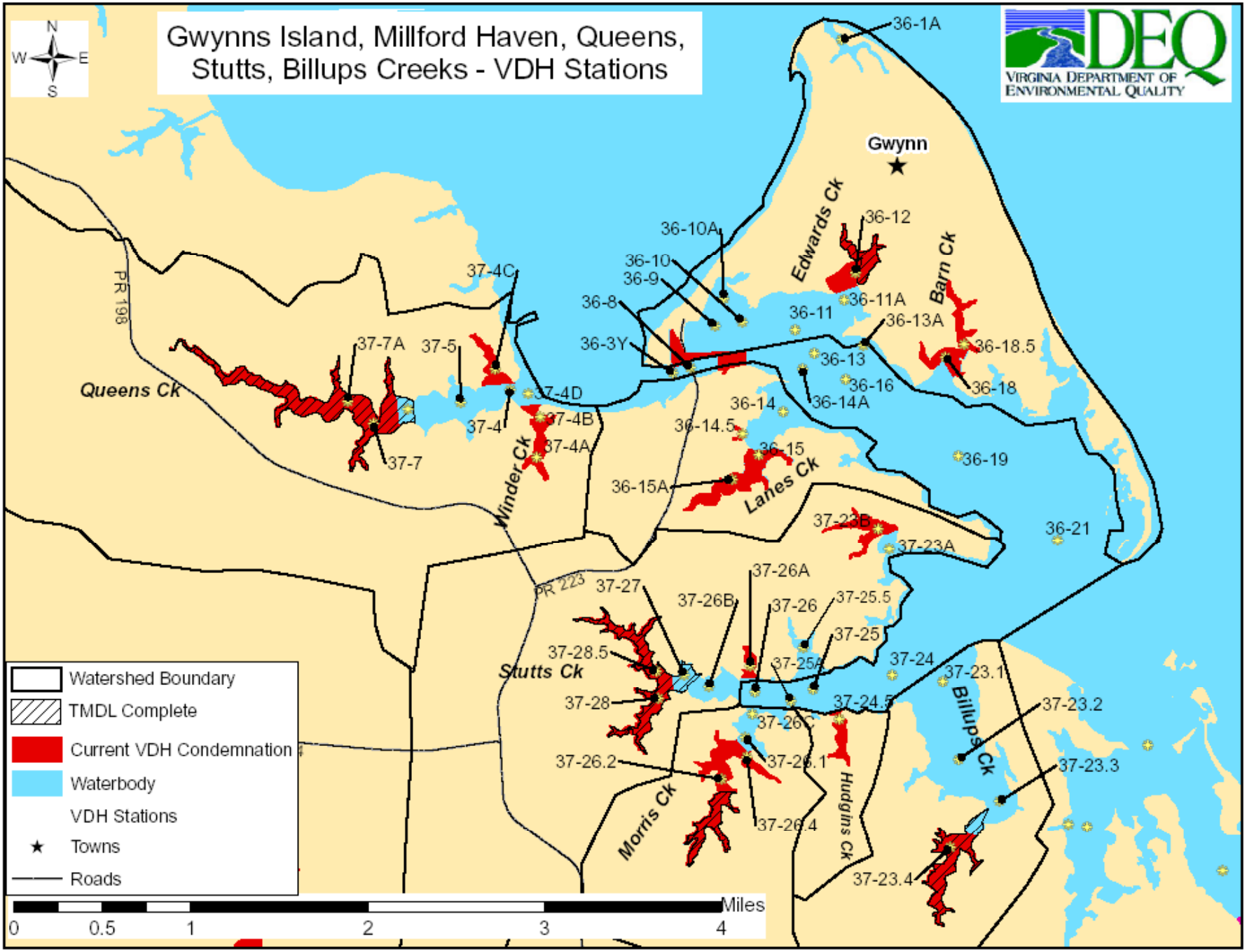
Sta Id	TMDLProjectArea	Parameter	LastSampled	#Visits	%Violation	Min	Max	StndDev
7-BRN000.23	Gwynns, MilfordHaven	Enterococci	7/12/2005	1	0%	25	2000	1397
7-CAV001.62	UppPiankatank (Nested)	Enterococci	11/15/2010	10	40%	0	0	0
7-COB001.19	LwrPiankatank	Enterococci	8/16/2010	1	0%	25	25	0
7-DRN003.40	UppPiankatank	Enterococci	11/18/2010	11	9%	25	1000	689
7-FER000.92	UppPiankatank (not nested)	Enterococci	6/10/2008	10	20%	25	300	194
7-HKC000.15	Gwynns, MilfordHaven	Enterococci	7/13/2005	1	100%	300	300	0
7-HKC000.18	Gwynns, MilfordHaven	Enterococci	7/13/2005	1	100%	480	480	0
7-HRP001.15	UppPiankatank (not nested)	Enterococci	11/17/2008	10	70%	25	1300	531
7-MLF000.52	Gwynns, MilfordHaven	Enterococci	7/15/2009	1	0%	10	10	0
7-MLF002.40	Gwynns, MilfordHaven	Enterococci	3/26/2012	51	6%	1	2000	997
7-MLF003.45	Gwynns, MilfordHaven	Enterococci	9/27/2007	1	0%	10	10	0
7-MLF004.23	Gwynns, MilfordHaven	Enterococci	7/7/2009	1	0%	10	10	0
7-MLF004.45	Gwynns, MilfordHaven	Enterococci	8/12/2008	1	0%	10	10	0
7-PNK005.78	UppPiankatank	Enterococci	11/17/2008	14	7%	20	300	143
7-PNK010.29	UppPiankatank	Enterococci	7/25/2007	1	0%	10	10	0
7-PNK010.39	UppPiankatank	Enterococci	2/17/2011	8	13%	25	125	55
7-PNK014.33	UppPiankatank	Enterococci	11/15/2010	23	9%	25	950	654
7-QUE001.52	Gwynns, MilfordHaven	Enterococci	3/26/2012	8	0%	25	25	0
7-STT000.45	Gwynns, MilfordHaven	Enterococci	8/21/2008	1	0%	10	10	0
7-STT002.92	Gwynns, MilfordHaven	Enterococci	3/26/2012	8	0%	25	100	43
7-XEP000.08	Gwynns, MilfordHaven, Barn Creek X-Trib	Enterococci	9/14/2010	1	100%	1000	1000	0
7BPNK003.14	Gwynns, MilfordHaven	Enterococci	7/25/2011	1	0%	10	10	0
7BPNK020.26	UppPiankatank	Enterococci	8/15/2011	1	0%	80	80	0
7BSTO000.62	Gwynns, MilfordHaven	Enterococci	7/18/2011	1	0%	10	10	0

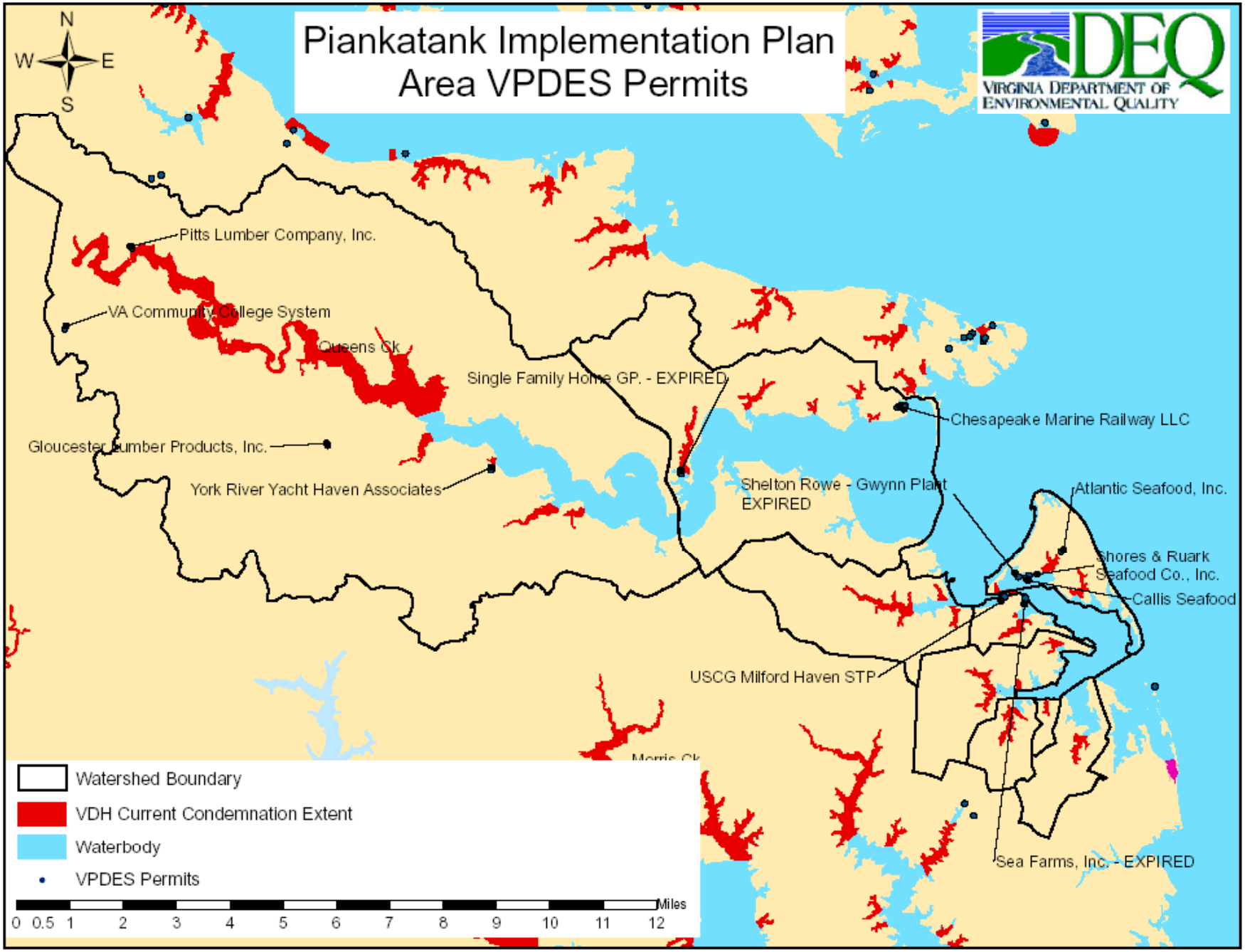

Upper Piankatank Watershed - DEQ Stations
Saluda
Hartfield
7-DRN003.40
7BPNK020.26
7-PNK010.39
7-CAV001.62
7-HRP001.15
7-PNK014.53
7-FER000.02
7-PNK010.29
Dragon Swamp
Upper Piankatank River
Harper Creek
French's Creek
Ferry Creek
Dancing Creek
PR 33
PR 198
PR 3
Watershed Boundary
TMDL Complete
VDH Current Impairment
Waterbody
DEQ Station
Towns
Roads
0 0.5 1 2 3 4 Miles
DEQ
Virginia Department of Environmental Quality


Upper Piankatank Watershed - VDH Stations
Saluda
Hartfield
Dragon Swamp
Upper Piankatank River
Harper Creek
French's Creek
Ferry Creek
Dancing Creek
Haines Ck
PR 33
PR 198
PR 3
35-36
35-34
35-37
35-35
35-33
35-31
35-29
35-28
35-32
35-30
35-28A
35-27
35-26
35-24.5
35-24
35-23
35-22
35-21
35-20
35-19
35-25
35-23B
35-23A
Watershed Boundary
TMDL Complete
VDH Current Impairment
Waterbody
VDH Station
Towns
Roads
0 0.5 1 2 3 4 Miles
DEQ
Virginia Department of Environmental Quality


Lower Piankatank - Wilton, Cobbs, Healy Creeks
Completed TMDLS and current VDH
Condmentation extents
DEQ
Virginia Department of Environmental Quality
Hartfield
Deltaville
Wilton Creek
Healy Creek
Cores Creek
Moore Creek
Porpoise Cove
Cobbs Creek
34-3A
34-3B
34-3E
34-3F
34-3G
34-4A
34-4B
34-4C
34-5
34-5.5
34-6
34-7
34-8
34-9
34-10
34-10A
34-11
34-12
34-13
34-14
34-14A
34-14B
34-14C
34-15
34-15.5
34-16
34-17
34-18
7-PNK005.78
7BPNK003.14
7-COB001.19
Towns
VDH Stations
DEQ Stations
Completed TMDLs
Current VDH Condemnation
Watershed Boundary
N
W
E
S
0
0.5
1
2
3
4
Miles


Gwynns Island, Millford Haven, Queens, Stutts, Billups Creeks - DEQ Stations
DEQ
Virginia Department of Environmental Quality
N
W
E
S
7BPNK003.14
7-MLF004.45
7-MLF004.23
7-MLF003.45
7-MLF002.40
7-MLF000.52
7-XEP000.08
7-BRN000.23
7-HKC000.15
7-HKC000.18
7-QUE001.52
7-STT002.92
Gwynn
Milford Haven
Queens Ck
Winder Ck
Edwards Ck
Barn Ck
Lanes Ck
Stutts Ck
Morris Ck
Hoggins Ck
Billups Ck
SC 631
SC 632
SC 626
SC 681
SC 719
SC 700
SC 733
SC 732
SC 668
SC 674
SC 652
SC 662
SC 736
SC 694
SC 627
PR 198
SC 616
SC 639
SC 669
SC 706
PR 223
SC 640
SC 648
SC 676
SC 688
SC 718
SC 611
SC 621
SC 641
SC 647
SC 643
SC 642
SC 665
SC 680
SC 708
SC 644
SC 682
SC 704
SC 664
SC 661
SC 636
SC 663
SC 656
SC 634
SC 637
SC 638
SC 690
Watershed Boundary
TMDL Complete
Current VDH Condemnation
Waterbody
DEQ Stations
Towns
Roads
0
0.5
1
2
3
4
Miles


Gwynns Island, Millford Haven, Queens, Stutts, Billups Creeks - VDH Stations
N
W
E
S
DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Gwynn
Edwards Ck
Barn Ck
Queens Ck
Winder Ck
Lanes Ck
Stutts Ck
Morris Ck
Hudgins Ck
Billups Ck
PR 198
PR 223
36-1A
36-12
36-10A
36-10
36-9
36-8
36-3Y
36-11A
36-11
36-13A
36-13
36-16
36-14A
36-14
36-14.5
36-15
36-15A
36-18.5
36-18
36-19
36-21
37-4C
37-7A
37-5
37-4D
37-4B
37-4A
37-4
37-7
37-23B
37-23A
37-26A
37-27
37-26B
37-26
37-25.5
37-25
37-28.5
37-25A
37-24
37-23.1
37-28
37-24.5
37-23.2
37-26C
37-26.2
37-26.1
37-23.3
37-26.4
37-23.4
Watershed Boundary
TMDL Complete
Current VDH Condemnation
Waterbody
VDH Stations
Towns
Roads
Miles
0
0.5
1
2
3
4


Piankatank Implementation Plan
Area VPDES Permits
DEQ
Virginia Department of Environmental Quality
N
W
E
S
Pitts Lumber Company, Inc.
VA Community College System
Queens Ck
Single Family Home GP. - EXPIRED
Chesapeake Marine Railway LLC
Gloucester Lumber Products, Inc.
York River Yacht Haven Associates
Shelton Rowe - Gwynn Plant
EXPIRED
Atlantic Seafood, Inc.
Shores & Ruark
Seafood Co., Inc.
Callis Seafood
USCG Milford Haven STP
Morris Ck
Sea Farms, Inc. - EXPIRED
Watershed Boundary
VDH Current Condemnation Extent
Waterbody
VPDES Permits
Miles
0 0.5 1 2 3 4 5 6 7 8 9 10 11 12