

**Table 2-1
Municipalities within the Metedeconk River Watershed**

County	Municipality	Area in Watershed (mi²)	Percent of Municipality in Watershed	Percent of Watershed
Monmouth	Howell Twp.	20.51	33%	26%
	Freehold Twp.	10.45	27%	13%
	Millstone Twp.	0.17	0%	0.2%
	Wall Twp.	0.34	1%	0.4%
	Total in Monmouth	31.47		40%
Ocean	Jackson Twp.	21.48	21%	27%
	Lakewood Twp.	17.36	69%	22%
	Brick Twp.	8.01	25%	10%
	Total in Ocean	46.84		60%

**Table 2-2
Summary of 2007 Land Use / Land Cover by Municipality within the Metedeconk River Watershed**

Municipality	Percent Impervious	Acres												
		Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands	Grand Total
Brick Township	24%	0.00	453.92	492.42	11.25	157.50	472.37	1,204.87	57.35	175.01	210.06	1,222.97	668.05	5,125.77
Freehold Township	2%	315.17	2,024.54	7.83	1.98	25.43	0.00	0.66	581.48	47.83	62.64	20.16	3,600.03	6,687.74
Howell Township	14%	814.72	2,525.13	490.50	107.81	271.12	153.97	2,834.67	1,634.88	297.61	382.43	66.66	3,545.27	13,124.77
Jackson Township	12%	404.29	3,625.38	274.36	92.36	256.56	331.23	1,773.17	2,499.23	288.64	654.95	100.91	3,443.23	13,744.30
Lakewood Township	22%	135.61	2,636.77	688.00	593.64	495.66	660.43	2,129.37	776.69	363.43	889.92	214.00	1,524.59	11,108.13
Millstone Township	10%	10.46	44.24	5.44	3.55	1.91	0.00	1.22	34.21	4.32	0.00	1.76	3.41	110.52
Wall Township	7%	15.33	143.23	0.00	0.00	0.00	0.00	21.46	26.96	0.93	10.06	0.00	0.00	217.98
Grand Total	15%	1,695.58	11,453.21	1,958.55	810.58	1,208.17	1,618.00	7,965.42	5,610.80	1,177.76	2,210.07	1,626.47	12,784.59	50,119.20

**Table 2-3
Summary of 1995/1997 Land Use / Land Cover by Municipality within the Metedeconk River Watershed**

Municipality	Percent Impervious	Acres												
		Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands	Grand Total
Brick Township	22%	8.49	598.96	445.59	15.02	155.23	498.76	1145.81	54.03	110.02	208.99	1175.26	709.60	5125.76
Freehold Township	1%	294.59	2170.58	8.42	0.00	20.86	0.00	0.70	440.94	50.42	44.64	16.17	3640.37	6687.70
Howell Township	12%	934.38	3060.39	311.08	99.44	314.00	152.69	2471.00	1440.02	218.10	271.42	45.24	3806.94	13124.70
Jackson Township	9%	671.17	5052.37	158.92	49.23	193.14	232.10	1271.47	1797.93	268.79	330.14	71.56	3647.48	13744.30
Lakewood Township	18%	180.37	3588.81	537.07	489.17	373.36	433.78	1882.11	789.12	235.89	796.46	177.04	1624.93	11108.11
Millstone Township	9%	11.01	51.26	3.76	2.79	6.22	0.00	1.11	28.23	0.65	0.00	1.31	4.18	110.51
Wall Township	4%	8.10	177.50	0.00	0.00	2.57	0.00	10.24	18.52	1.04	0.00	0.00	0.00	217.97
Grand Total	12%	2108.11	14699.87	1464.84	655.64	1065.38	1317.34	6782.43	4568.79	884.90	1651.65	1486.59	13433.50	50119.04

**Table 2-4
Change in Land Use/Land Cover from 1995 to 2007**

Municipality	Percent Impervious	Acres											
		Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands
Brick Township	2%	(8.49)	(145.03)	46.83	(3.77)	2.26	(26.39)	59.07	3.32	64.99	1.07	47.70	(41.55)
Freehold Township	0%	20.58	(146.04)	(0.59)	1.98	4.57	0.00	(0.04)	140.54	(2.59)	18.01	3.99	(40.34)
Howell Township	2%	(119.66)	(535.26)	179.42	8.37	(42.88)	1.27	363.67	194.86	79.51	111.01	21.43	(261.67)
Jackson Township	4%	(266.88)	(1426.99)	115.44	43.13	63.42	99.13	501.70	701.30	19.84	324.81	29.35	(204.25)
Lakewood Township	4%	(44.76)	(952.04)	150.93	104.47	122.30	226.65	247.27	(12.43)	127.54	93.47	36.97	(100.34)
Millstone Township	2%	(0.55)	(7.01)	1.68	0.76	(4.31)	0.00	0.11	5.98	3.67	0.00	0.45	(0.77)
Wall Township	3%	7.23	(34.27)	0.00	0.00	(2.57)	0.00	11.23	8.44	(0.11)	10.06	0.00	0.00
Grand Total	5%	(412.53)	(3246.66)	493.70	154.94	142.79	300.67	1183.00	1042.01	292.86	558.42	139.89	(648.92)

**Table 2-5
Summary of 2007 Land Use / Land Cover by HUC14 within the Metedeconk River Watershed**

HUC14	Alternate ID	Branch	Percent Impervious	Acres												
				Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands	Grand Total
02040301020010	NB1	Metedeconk River NB	4%	374.54	1,261.96	58.19	12.87	54.61	15.69	47.02	624.02	58.26	85.42	18.75	2,864.52	5,475.84
02040301020020	NB2	Metedeconk River NB	19%	265.96	1,169.15	319.03	16.01	140.80	62.57	1,985.57	1,210.04	218.88	148.35	18.95	1,393.37	6,948.69
02040301020030	NB3	Metedeconk River NB	14%	169.52	614.01	144.36	27.92	54.90	59.06	955.03	506.00	51.20	62.03	27.37	1,244.70	3,916.08
02040301020040	NB4	Metedeconk River NB	7%	310.28	994.28	27.14	36.42	56.08	11.82	257.65	282.86	63.63	216.29	11.11	814.51	3,082.08
02040301020050	NB5	Metedeconk River NB	22%	123.78	1,007.46	239.82	51.99	172.21	492.52	1,319.83	314.78	203.65	403.15	44.93	690.52	5,064.63
	Sub Total	Metedeconk River NB	14%	1,244.08	5,046.86	788.54	145.22	478.59	641.67	4,565.09	2,937.70	595.63	915.24	121.11	7,007.62	24,487.33
02040301030010	SB1	Metedeconk River SB	3%	182.79	1,092.24	13.63	32.86	25.22			134.96	42.66	21.26	15.42	1,641.94	3,202.99
02040301030020	SB2	Metedeconk River SB	7%	94.57	1,303.70	5.66	26.29	66.07	20.76	171.09	419.77	80.01	316.97	42.78	1,055.93	3,603.60
02040301030030	SB3	Metedeconk River SB	13%	130.70	1,113.65	123.62	25.47	89.54	103.74	579.04	1,142.21	41.99	210.39	44.54	1,230.77	4,835.66
02040301030040	SB4	Metedeconk River SB	19%	41.34	1,220.50	175.23	151.98	117.68	343.32	1,114.14	773.04	69.81	281.01	101.69	611.26	5,001.01
02040301030050	SB5	Metedeconk River SB	26%	2.10	750.80	336.02	204.84	165.72	217.78	467.95	69.00	93.90	198.21	74.38	497.09	3,077.78
	Sub Total	Metedeconk River SB	14%	451.50	5,480.89	654.16	441.45	464.23	685.60	2,332.22	2,538.97	328.38	1,027.84	278.81	5,036.98	19,721.04
02040301040020	CNFL1	Metedeconk River	23%		925.44	515.85	223.91	265.35	290.73	1,068.11	134.12	253.76	266.99	1,226.55	739.98	5,910.79
Grand Total	Grand Total		15%	1,695.58	11,453.19	1,958.55	810.58	1,208.17	1,618.00	7,965.42	5,610.80	1,177.76	2,210.07	1,626.47	12,784.58	50,119.16

**Table 2-6
Summary of 1995/1997 Land Use / Land Cover by HUC14 within the Metedeconk River Watershed**

HUC14	Alternate ID	Branch	Percent Impervious	Acres												
				Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands	Grand Total
02040301020010	NB1	Metedeconk River NB	3%	349.97	1,426.17	44.96	11.55	44.33	13.01	29.48	493.15	51.74	67.39	12.24	2,931.82	5,475.80
02040301020020	NB2	Metedeconk River NB	17%	263.23	1,507.38	247.81	16.71	182.15	58.92	1,906.54	907.37	175.97	114.57	12.40	1,555.64	6,948.69
02040301020030	NB3	Metedeconk River NB	12%	166.40	748.91	46.44	30.13	71.65	63.17	917.12	420.42	33.69	84.39	25.47	1,308.27	3,916.07
02040301020040	NB4	Metedeconk River NB	4%	397.15	1,276.53	11.54	30.81	33.70	12.10	14.63	243.28	58.21	117.87	6.85	879.36	3,082.03
02040301020050	NB5	Metedeconk River NB	19%	200.22	1,285.70	216.01	55.25	159.85	444.97	1,127.42	291.78	170.92	338.81	19.12	754.61	5,064.64
	Sub Total	Metedeconk River NB		1,376.96	6,244.69	566.76	144.45	491.68	592.18	3,995.19	2,356.00	490.53	723.02	76.08	7,429.70	24,487.23
02040301030010	SB1	Metedeconk River SB	2%	180.44	1,137.35	6.16	16.84	25.30		1.14	97.30	35.49	27.01	12.80	1,663.15	3,202.98
02040301030020	SB2	Metedeconk River SB	4%	146.38	1,635.37	6.54	15.67	53.20	7.15	12.79	392.72	54.31	150.50	29.31	1,099.70	3,603.62
02040301030030	SB3	Metedeconk River SB	8%	353.40	1,755.56	52.56	7.19	51.90	70.89	269.31	849.72	36.83	63.88	33.70	1,290.72	4,835.65
02040301030040	SB4	Metedeconk River SB	17%	38.87	1,627.06	127.11	80.95	93.49	254.48	1,044.00	660.75	60.49	279.10	100.18	634.55	5,001.01
02040301030050	SB5	Metedeconk River SB	20%	3.58	1,101.25	262.69	195.20	145.12	86.72	433.65	100.94	37.51	120.54	56.70	533.87	3,077.77
	Sub Total	Metedeconk River SB		722.66	7,256.58	455.05	315.84	369.01	419.23	1,760.89	2,101.43	224.63	641.03	232.69	5,221.99	19,721.03
02040301040020		Metedeconk River	20%	8.49	1,198.58	440.05	195.34	204.70	305.93	1,026.35	114.36	169.75	287.60	1,177.82	781.82	5,910.79
Grand Total			12%	2,108.11	14,699.86	1,461.87	655.64	1,065.38	1,317.34	6,782.42	4,571.79	884.91	1,651.65	1,486.59	13,433.51	50,119.05

**Table 2-7
Change in Land Use/Land Cover from 1995 to 2007**

HUC14	Alternate ID	Branch	Percent Impervious	Acres												
				Agriculture	Forest	Commercial	Industrial	Mixed Urban	High Residential	Medium Residential	Low Residential	Trans/Comm/Utility	Urban Open	Water	Wetlands	
02040301020010	NB1	Metedeconk River NB	1%	24.58	(164.21)	13.22	1.32	10.27	2.68	17.54	130.87	6.52	18.03	6.51	(67.30)	
02040301020020	NB2	Metedeconk River NB	2%	2.73	(338.23)	71.22	(0.70)	(41.35)	3.65	79.03	302.67	42.92	33.79	6.55	(162.27)	
02040301020030	NB3	Metedeconk River NB	2%	3.12	(134.91)	97.92	(2.21)	(16.75)	(4.11)	37.91	85.58	17.50	(22.36)	1.90	(63.57)	
02040301020040	NB4	Metedeconk River NB	3%	(86.87)	(282.25)	15.60	5.61	22.38	(0.28)	243.02	39.58	5.42	98.42	4.25	(64.84)	
02040301020050	NB5	Metedeconk River NB	2%	(76.44)	(278.24)	23.81	(3.26)	12.36	47.55	192.40	23.00	32.73	64.34	25.81	(64.09)	
	Sub Total	Metedeconk River NB		(132.88)	(1,197.84)	221.77	0.77	(13.09)	49.49	569.90	581.70	105.10	192.22	45.03	(422.08)	
02040301030010	SB1	Metedeconk River SB	1%	2.36	(45.11)	7.48	16.02	(0.08)	-	(1.14)	37.66	7.17	(5.75)	2.62	(21.21)	
02040301030020	SB2	Metedeconk River SB	3%	(51.81)	(331.67)	(0.88)	10.62	12.87	13.62	158.30	27.05	25.70	166.47	13.48	(43.77)	
02040301030030	SB3	Metedeconk River SB	5%	(222.69)	(641.91)	71.06	18.29	37.64	32.85	309.72	292.49	5.16	146.51	10.84	(59.95)	
02040301030040	SB4	Metedeconk River SB	3%	2.47	(406.55)	48.12	71.03	24.20	88.84	70.14	112.29	9.32	1.91	1.51	(23.29)	
02040301030050	SB5	Metedeconk River SB	6%	(1.49)	(350.45)	73.34	9.64	20.59	131.06	34.30	(31.94)	56.40	77.67	17.68	(36.78)	
	Sub Total	Metedeconk River SB		(271.16)	(1,775.69)	199.11	125.61	95.22	266.37	571.33	437.54	103.74	386.82	46.13	(185.01)	
02040301040020		Metedeconk River	3%	(8.49)	(273.14)	75.79	28.57	60.65	(15.19)	41.76	19.76	84.01	(20.61)	48.73	(41.84)	
Grand Total			3%	(412.53)	(3,246.66)	496.68	154.94	142.79	300.66	1,183.00	1,039.01	292.85	558.42	139.88	(648.93)	

**Table 2-8
Acres of "Developable Land" by Municipality**

	Land Use Category	Zoning Category (acres)						Grand Total
		Business/Office	Industrial/Research	Preserved	Residential	Recreation/Open Space	Tidelands	
Brick Township	Barren Lands				21.597			21.597
	Cemetery	5.691			0.010			5.701
	Commercial	397.780		0.192	50.428			448.400
	Forest	123.739		14.835	219.214			357.788
	Industrial	6.637		0.014	3.982			10.633
	Mixed Urban	45.992		0.052	55.943			101.987
	Recreation	20.479			132.620			153.099
	Residential	58.004		0.483	1,420.744			1,479.230
	Stormwater Basin	14.897			2.039			16.935
	Trans/Comm/Utility	6.784		0.061	27.760			34.605
	Water	12.797		1.106	197.500		0.132	211.534
	Wetlands	90.599		14.230	539.183			644.012
	Grand Total	783.399		30.973	2,671.018		0.132	3,485.522
	Potential acres from open land use to developed, based on zoning							
	517.649							
Freehold Township	Agriculture			8.977	328.072			337.050
	Barren Lands				31.489			31.489
	Commercial				7.666			7.666
	Forest			1,011.090	1,081.043			2,092.133
	Industrial				1.975			1.975
	Mixed Urban				28.998			28.998
	Recreation				38.789			38.789
	Residential			9.567	599.378			608.945
	Stormwater Basin				7.496			7.496
	Trans/Comm/Utility			2.392	49.154			51.546
	Water			2.096	18.066			20.163
	Wetlands			1,753.238	1,867.264			3,620.502
	Grand Total			2,787.361	4,059.391			6,846.752
	Potential acres from open land use to developed, based on zoning							
	1,479.394							
Howell Township	Agriculture	5.143			813.032			818.175
	Barren Lands	8.105			140.457			148.562
	Cemetery				3.069			3.069
	Commercial	362.385			128.006			490.390
	Forest	300.310		90.389	2,135.173			2,525.873
	Industrial	84.085			23.723			107.808
	Mixed Urban	84.322			183.864			268.186
	Recreation	3.278			125.985			129.263
	Residential	53.770			4,521.815			4,575.585
	Stormwater Basin	26.350			83.056			109.406
	Trans/Comm/Utility	164.363		0.209	132.779			297.351
	Water	10.978			52.857			63.834
	Wetlands	403.138			3,145.780			3,548.918
Grand Total	1,506.227		90.599	11,489.594			13,086.420	
	Potential acres from open land use to developed, based on zoning							
	3,531.484							
Jackson Township	Agriculture	91.342		83.528	201.083	0.007		375.960
	Barren Lands	31.208	23.282		222.714			277.204
	Cemetery				6.950			6.950
	Commercial	168.156	6.672		63.124	12.534		250.486
	Forest	321.812	237.973	208.116	2,569.056	30.831		3,367.788
	Industrial	14.992	43.329	0.151	30.118	0.141		88.731
	Mixed Urban	51.802	6.658		112.295	8.853		179.607
	Recreation	1.183			213.722	13.806		228.711
	Residential	131.595	31.854	4.850	3,837.615	2.168		4,008.082
	Stormwater Basin	14.947	0.945		75.998	0.696		92.585
	Trans/Comm/Utility	5.301	1.386	1.334	96.208	3.519		107.749
	Water	7.987	3.561	1.823	85.754	0.800		99.926
	Wetlands	290.366	336.594	434.139	2,238.563	62.143		3,361.805
Grand Total	1,130.691	692.253	733.942	9,753.199	135.498		12,445.583	
	Potential acres from open land use to developed, based on zoning							
	3,913.375							
Lakewood Township	Agriculture	0.192	0.802	34.270	92.782	2.605		130.649
	Barren Lands	12.920	79.202		69.199	1.952		163.273
	Cemetery	3.151	0.032		21.962	0.660		25.805
	Commercial	292.374	100.175		204.921	3.705		601.175
	Forest	131.960	648.278	61.327	1,003.002	438.024		2,282.591
	Industrial	24.493	541.439		4.717	7.608		578.256
	Mixed Urban	85.706	185.944	0.030	121.568	6.104		399.352
	Recreation	4.334	1.280		280.081	257.216		542.911
	Residential	138.096	15.941	3.126	2,750.417	9.466		2,917.046
	Stormwater Basin	3.452	47.572		27.843			78.868
	Trans/Comm/Utility	24.055	119.029	3.227	57.984	12.905		217.200
	Water	11.311	14.577	2.166	115.385	70.770		214.208
	Wetlands	135.310	360.717	127.838	617.675	205.284		1,446.824
Grand Total	867.355	2,114.989	231.983	5,367.536	1,016.297		9,598.160	
	Potential acres from open land use to developed, based on zoning							
	2,324.032							

**Table 2-9
USGS Stream Gages along the Metedeconk River**

USGS Site ID	Name	Drainage Area (sq. mi)	Period of Record
01408120	North Branch Metedeconk River near Lakewood NJ	34.9	October 1972 to Present
01408140	South Branch Metedeconk River at Lakewood NJ	26.0	October 1972 through September 1976
01408150	South Branch Metedeconk River near Lakewood NJ	27.5	June 1992 through March 1999

**Table 2-10
Summary Flow Statistics for North Branch Metedeconk River near Lakewood, NJ**

Statistic	Flow (cfs)	
	1973 – 2009	1990-2009
Average	60.10	58.56
Standard Deviation	55.01	55.15
Coefficient of Variation	0.92	0.94
Maximum	1300	1300
Minimum	7.40	7.4
7Q10	11.57	11.00

**Table 2-11
Summary Statistics for North Branch Metedeconk River: Development Impact**

Statistic	cfs		Mann-Kendall Statistics		Trend?	Confidence Interval (%) / alpha
	Annual Average	Coefficient of Variation	S	P		
Q _{mean}	60.11	0.22	-32	0.34	No	90/0.1
T _{Qmean}	0.32	0.11	-105	0.087	Yes (declining)	90/0.1
Q _{min}	19.50	0.33	-106	0.084	Yes (declining)	90/0.1
Q _{max}	474.16	0.47	74	0.17	No	90/0.1

**Table 3-1
Potential Restoration Sites as Identified in the VAPP Analysis**

Site	Score / Rank	Description	Restoration
CB1	6.9/ Fair	Receives runoff from bowling alley parking lot, banks are eroding and attempts have been made at stabilization, high flows may be coming from upstream sources	BMP to address parking lot runoff and/or streambank restoration project, upstream detention basin near Joe Parker Rd may also be a possible retrofit to reduce flows. BMP for upstream nursery and expansion of riparian buffer upstream.
CB5	6.2/ Fair	The tributary is a headwater stream fed by stormwater from a very urbanized area of Lakewood, no BMPs observed, litter present	The drainage area of this reach is a possible source of nonpoint source pollution, reduction of stormwater volumes onsite or a BMP at the beginning of reach. Possible riparian buffer restoration.
CBB-1	7.0/Fair	Reach located in a large commercial area, downstream of CCB-3, unstable banks, this site is downstream of the BTMUA intake	The drainage area of this reach is a source of nonpoint source pollution and high flows of stormwater runoff, restoration of this site would be in partner with upstream stormwater controls and streambank restoration at site CBB-1. Possible opportunity for basin retrofit and improvements in housekeeping and stormwater infrastructure maintenance at adjacent shopping center(s).
CBB-3	3.3/ Poor	Reach runs through a large commercial area near the Brick Mall, banks are unstable and there is a lot of sediment, this site is downstream of the BTMUA intake	While this tributary meets the Metedeconk River downstream of the BTMUA, there are most likely water quality impacts on the Barnegat Bay, it appears there is very little treatment of stormwater from the shopping centers which are a large source of NPS
CP-3	3.9/Poor	Reach runs through a residential area near Forest Dr in Lakewood, erosion along stream banks, riparian buffer is narrow, and outfalls discharge directly to stream, there is an upstream lake and wooden dams and bulkheads have been constructed along the reach to prevent erosion	Reach is a possible site for streambank restoration to address erosion and restore riparian area, high stormwater flows or flow from the lake seems to be an issue, also could also be a candidate for on-site stormwater management such as rain gardens
CVS-1	8.5/Good	While this site scored good in the VAPP, there was a lot of litter in the reach and outfalls are silted in, runoff from the apartment complex is discharged directly to the stream	Possible BMP demonstration site to address runoff from apartment complex . Possibility of reestablishing some riparian buffer area; dumping occurring along reach – fencing would be beneficial.
DB-1			Agricultural BMPs may be beneficial at the herb farm adjacent to the reach. May also be an opportunity to improve riparian buffers.
GH1	5.5/Poor	Unstable banks and signs of high stormwater flows observed in VAPP, tributary begins in a residential area, waterfowl present in upstream ponds and algae in stream may indicate nutrients from fertilizer	Possible retrofits of the detention basin(s) in the area, particularly one found in disrepair adjacent reach. VAPP indicates reach is along fire dept property, this may be a candidate for stream/riparian buffer restoration and/or installation of a BMP
GR2	5.7/Poor	Stream is fed by stormwater from residential development at Newton's Corner Rd, Howell, habitat scores are low and algae was observed	There are detention basins in the development which may be candidates for retrofits to reduce stormwater flows and remove nutrients.
GR4	8.2/Good	Reach is downstream of GR2, there are signs of high stormwater flows and sediment in reach near outfalls from detention basins	Restoration of this site may be achieved through restoration of BMPs at the upstream reach GR2, retrofits to the detention basins along the reach are also a possibility.
HS6	4.7/Poor	Stream may have been re-routed during bridge construction, low channel scores, reach receives runoff from residential area, sediment in stream	Possible retrofits to upstream detention basins or on-site stormwater management on residential lots, e.g. rain gardens.
MF3	6.2/Poor	Headwater stream crossing Co Rd 547, Howell, culvert under road is above elevation of stream reach, stream appears to have been straightened	Reach is adjacent to a horse farm, possible site for agricultural BMP. Potential to improve riparian buffer area.
NA		Immediately upstream of BTMUA intake. Direct stormwater discharge from roadway. Stormwater runoff from the development to the north also discharges upstream of the reach.	BMP at the Garden State Parkway median just upstream of the reach.
NF	6.6/Fair	Reach receives runoff from commercial area along Rt 9 in Lakewood, low channel and habitat scores	Restoration would need to address runoff from Rt 9 and businesses along Rt 9 such as parking lot BMPs. Potential for restoration of riparian area (lawn and unused parking lot area).
NF14	6.4/Fair	Reach receives runoff from commercial area via a major outfall – possibly from Kennedy Blvd and an apartment complex, sediment in stream, there is a parking lot very close to the stream	Possible BMP to address runoff from apt complex and parking lot adjacent to stream. Major storm outfall warrants additional study for potential BMPs to reduce runoff volumes from catchment area, improve water quality, identify illicit connections, etc.; also potential for some restoration of riparian area (lawn and unused parking lot area)
NK	5.6/Poor	Reach crosses Hulses Corner Rd, Jackson, very turbid water observed, agriculture upstream along Farmingdale Rd, low habitat scores, unstable banks and possible nutrient enrichment	Turbid water appearance may suggest NPS from agriculture, possible site for agriculture BMPs
NQ	5.8/Poor	Headwater to the North Branch crosses Co Rd 537, Millstone, reach begins downstream of pond in which there is a buffer only on 25% of shoreline	Restoration of shoreline buffer around pond may deter waterfowl and filter nutrients from stormwater runoff.
PB2	6.7/Fair	Reach connects Echo Lake and downstream lake, habitat scores are low and there is a spillway from the lake at the start of the reach	Possible BMP for the parking lot runoff at Echo Lake. Echo Lake shoreline restoration/management and waterfowl control would likely be beneficial.
SA	8.7/Good	Reach on the South Branch, of good condition, however reach receives runoff from high traffic area – Chambersbridge Rd on-ramp to the GSP, and industrial area to the south	May be a good place for BMPs or other stormwater treatment facilities since site is upstream from the BTMUA intake

**Table 3-1
Potential Restoration Sites as Identified in the VAPP Analysis**

Site	Score / Rank	Description	Restoration
SC			May be opportunity for smaller BMPs at the western entrance to Lake Shenandoah County Park. Would provide a good opportunity for public education.
SD	8.2/Good	Reach generally of good condition, receives runoff from commercial areas on Hurley Ave and Clifton Ave via outfall, Cedar Bridge Baseball Field also nearby	Baseball complex may be a site for BMPs, commercial area could be a source of NPS and possible sites for stormwater retrofits
SE & SG		Located at the eastern and western boundaries of Lake Carasaljo.	Potential for lake and shoreline management/restoration and BMPs around the lake.
SE-P	4.0/Poor	Headwater reach of SD, poor channel condition, unstable banks and erosion, fed by stormwater from residential area, runs behind Bais Rivka Rochel on River Ave, Lakewood	This may be a possible site for stream bank restoration if the upstream stormwater runoff is also addressed. Possibility for retrofits of detention basins and wet ponds in the area.
SG	7.6/ Good	Reach is downstream of Lakewood Country Club on main stem of South Branch, receives discharge from detention basins	Possible retrofit of detention basin. Potential for BMP to address direct stormwater discharges. Also potential for streambank and/or riparian buffer restoration.
SH-1	4.9/Poor	Receives parking lot runoff, outfalls discharge directly to stream, channel in fair condition	BMP to address parking lot runoff, could be part of a restoration project for CB1. Stormwater inlet should be flushed and maintained as well as upgraded to strain floatables.
SH-3	4.7/Poor	Reach flows through a picnic area at Ocean County Park and connects two lakes, riparian buffer is compromised, upstream of site CB1	Possible restoration and demonstration site to restore riparian buffer along the reach, opportunity for education and outreach. BMP for parking lot stormwater runoff. Lake management measures and waterfowl control would likely be beneficial.
SHB2	5.2/Poor	Headwater stream to the same tributary as MF3 and TKL1, fed by stormwater from residential development multiple detention basins discharge to stream, sediment and algae observed	Possible retrofit of detention basins in residential area, also opportunity for BMPs at the sports complex and parking lots along Lakewood-Allenwood Rd
SI			Lake Eno (immediately upstream) would benefit from lake management measures to address nuisance vegetation problems, etc.
SK			Jackson Mills Lake (immediately upstream) would benefit from lake management measures to address nuisance vegetation problems, etc.
SPC1	3.2/Poor	This tributary meets up with the tributary of HS6, reach is fed by stormwater from residential area, a lot of algae and a narrow riparian buffer	The Newbury Elementary School is at the beginning of the reach and may be a possible site for a BMP demonstration site such as a bioretention basin, treatment wetland or a vegetated swale
TKL1	5.0/Poor	Headwater stream to the same tributary as MF3, runs through rural residential/ agricultural area, low habitat scores, narrow riparian buffer	Reach may be a candidate for buffer restoration or agricultural BMPs in the adjacent areas
TM-8	6.3/Fair	Reach is fed by detention basin outfall, receives runoff from KMART and PathMark shopping center on Rt 9, sediment in reach, turbid water – also observed downstream at NH	Possible retrofit of detention basin and BMPs to treat and control runoff from the shopping center
TR1-2	4.1/Poor	Reach along Lanes Mill Rd, Brick, erosion along banks with attempts to stabilize them, stream receives runoff from a concrete drainage channel and an adjacent park and ride parking lot and Lanes Mill Rd, very turbid water observed	Stream bank restoration site with BMP to address runoff from parking lot
TR12-1 TR13-1 TR13-2 TR13-3 TR13-5 TR14-1 TR15-1			Each of these sites has detention basins in the vicinity that may be good candidates for retrofit.
TR12-2	7.3/Fair	Headwater tributary to South Branch crosses Hyson Rd, Jackson, low habitat scores, detention basins discharge upstream and downstream of reach, receives runoff upstream from I-195, algae present in downstream reach TR12-1	Since this is a headwater stream, detention basin retrofits could be considered, large residential lots to east of reach suggest this area was more recently developed. Sampling data at TR12-1 indicates high conductivity. This may be a priority reach for restoration since historical data is available
TR21-2	3.6/Poor	Tributary upstream of Lake Carasaljo in Lakewood, and downstream of CP-3, erosion along banks and nutrients and algae observed in adjacent pond, lawns mowed up to banks	Reach runs through residential area with no stormwater BMPs, site could be a part of a restoration plan for CP-3 and Lake Carasaljo
TR23-1	7.1/Fair	Reach receives runoff from large residential development on Aldrich Rd and Forest Dr, low habitat scores	No stormwater BMPs observed along reach, Woodland park may be a good location for a BMP to treat runoff that is discharged at the outfall off Arkansas Dr
TR4-1			Implementation of stormwater BMPs for stormwater runoff (from Lakewood Industrial Park).
TUR2	4.6/Poor	Stream originates from stormwater runoff at Fox Hill Dr, Howell, crosses Rt 9 and receives runoff from commercial area, appears stream has been straightened and low habitat scores	Headwater stream, BMPs may be appropriate to address runoff from residential areas and commercial parking lots. May be opportunity for restoration of riparian buffer area and/or streambank

Table 4-1
Community Public Supply Wells within the Metedeconk River Watershed Screened into the
Kirkwood-Cohansey Aquifer

Owner	Well ID	Total Depth (ft)	Top of Screen (ft)	Bottom of Screen (ft)	Capacity (gpm)
Brick Twp MUA	Well 2	67	40	57	151
Brick Twp MUA	Well 3	69	39	59	240
Brick Twp MUA	Well 4	67	27	57	200
Brick Twp MUA	Well 5	67	32	57	200
Brick Twp MUA	Well 6	67	37	57	200
Brick Twp MUA	Well 7	70	40	60	200
Brick Twp MUA	Well 8	70	40	60	200
Brick Twp MUA	Well 13	55	30	50	325
Brick Twp MUA	Well 14	48	28	43	250
Green Acres Manor	Well 1	150	0	0	40
Lakewood Twp MUA	Well 5	62	43	62	300
NJ American Water Co	Well 12 ¹	147	58	78	400
NJ American Water Co	Well 13 ¹	97	60	75	480
NJ American Water Co	Well 14 ¹	98	60	75	345
NJ American Water Co	Well 15	105	80	100	350
NJ American Water Co	Well 16	125	70	120	350
Parkway Water Co (BTMUA)	Well 2	66	56	66	180
Parkway Water Co (BTMUA)	Well 3	69	49	59	150
Parkway Water Co (BTMUA)	Well 4	73	53	63	80
Parkway Water Co (BTMUA)	Well 5	56	36	46	150
Parkway Water Co (BTMUA)	Well 6	61	41	51	120
Parkway Water Co (BTMUA)	Well 7 ¹	84	52	72	150
Parkway Water Co (BTMUA)	Well 8 ¹	75	50	70	160

1. Well is located outside the watershed boundary, but WHPA overlaps into the watershed.

Table 4-2
Summary of Groundwater Concentrations of Some Inorganic Constituents (data from NJAW,
BTMUA)

Parameter	Max	Min	Units
Chloride	3.1	109.8	mg/L
Chromium	0.001	0.027	mg/L
Copper	0.01	0.06	mg/L
Iron	0.08	8.31	mg/L
Lead	0.001	0.092	mg/L
Manganese	0.01	0.18	mg/L
Nitrate as Nitrogen	0.02	3.21	mg/L
Sulfate	0.6	20	mg/L
Zinc	0.01	0.07	mg/L

Table 4-3
Most Frequently Detected VOCs in the Metedeconk River (2008)

Compound	Average Concentration (ug/L)	Maximum Concentration (ug/L)
Tetrachloroethylene	4.85	61.50
cis-1,2-Dichloroethylene	2.94	27
Trichloroethylene	1.14	4.80
Benzene	5.74	21
Naphthalene	22.80	300
Chloroform	0.89	1.60
Methyl tert-butyl ether	1.00	9.80
Toluene	1.65	4.90
Ethylbenzene	4.91	12
Isopropyl benzene	0.78	1.50

Table 4-4
Export Coefficients or Unit Area Loads used for Phosphorus Load Evaluation (from NJDEP, 2005)

Land Use	Unit Area Load (kg TP/ha/yr)
Mixed density residential	1.2
Medium/high density residential	1.6
Low density/ rural residential	0.7
Commercial	2.0
Industrial	1.7
Mixed/ other urban	1.0
Agricultural	1.5
Forest, wetland, water	0.1
Barren Land	0.5

Table 4-5
Phosphorus Load Calculated from 2007 Land Use and Phosphorus Export Coefficients¹

HUC14	ID	Total (ton/yr)
02040301020010	NB1	0.804
02040301020020	NB2	2.617
02040301020030	NB3	1.287
02040301020040	NB4	0.721
02040301020050	NB5	2.058
Sub Total Metedeconk River NB		7.488

1. Note that a TMDL for phosphorus exists only for NB1.

**Table 4-6
Summary of TMDLs in the Metedeconk River Watershed**

TMDL	Stream Fecal Coliform		Lake Fecal Coliform		Total Coliform	Phosphorus
	N. Branch	S. Branch	Lake Carasaljo	Ocean County Park Lake		
Segment						N. Branch (NB1)
Standard	SWQS: 10% of samples during 30 day period not to exceed 400 cfu/100 ml; nor average 200 cfu/100 ml		HD: single sample 235 cfu/100ml		NSSP: single sample 330 cfu/100ml and mean 70 cfu/100ml	SWQS: 0.1 mg/l
Percent Reduction	90% (overall)	90% (overall)	99% (overall)	96% (overall)	87% (overall) 89% (urban, ag, & marinas)	49.8% (overall) 84.9% (urban and ag)

**Table 6-1
Impervious Surface as an Indicator of Stream Health (from Schueler, 1995)**

Characteristic	Sensitive	Degrading	Non-Supporting
Percent Impervious Cover	0% to 10%	11% to 25%	26% to 100%
Channel Stability	Stable	Unstable	Highly unstable
Water Quality	Good to Excellent	Fair to Good	Fair to Poor
Stream Biodiversity	Good to Excellent	Fair to Good	Poor
Pollutants of Concern	Sediment and temperature only	...also nutrients and metalsalso bacteria