

Appendix A: Updated Water Supply and Demand Projections (2018)

Table A1. Supply Projections, Items in red were updated in 2018

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
CHESAPEAKE	Northwest River Intake	10.0	30% loss to RO	3.0	7.0
CHESAPEAKE	Northwest River wells	2.0	30% loss to RO	0.6	1.4
CHESAPEAKE	Western Branch wells	1.5	Internal system losses (backwashing , etc)	0.06	1.44
CHESAPEAKE	Any combination of wells for a qualifying events	10	30% loss to RO	3	7
CHESAPEAKE	Raw water purchase from Norfolk of 7 MGD	7	10% loss to UF and other production processes	0.70	6.3
CHESAPEAKE	1/6 share of Lake Gaston - infrastructure needed	10.0	10% loss	1.0	9.0
CHESAPEAKE	Finished Water purchase from Norfolk				2.01
CHESAPEAKE	Finished Water purchase from Portsmouth				3
NORFOLK	Intown and Western Branch Reservoirs, Blackwater and Nottoway River intakes, Suffolk wells	92.5	3.3% loss in transmission and 0.8 MGD loss in production processes	3.4	76.1
NORFOLK	Raw Water Sold to Chesapeake	-7	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Raw Water Sold to Suffolk	-4.5	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Raw Water Sold to Isle of Wight	-1.5	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Finished Water sold to Chesapeake				-2.01

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
PORTSMOUTH	Production wells (5.0 mgd) and Speights Run, Lake Kilby, Lake Cohoon, Lake Meade (19.1mgd) (drought wells not included)	24.1	12.2% Losses in Production Processes	2.9	21.2
PORTSMOUTH	Drought Emergency Relief Wells	10.33	12.2% Losses in Production Processes	1.23	9.1
PORTSMOUTH	Finished Water sale to Chesapeake				-3
PORTSMOUTH	Finished Water Sale to Suffolk				-2.56
SUFFOLK	Crumps Mill Pond, Lone Star Lakes	1.2	3% loss	0.04	1.16
SUFFOLK	WTWA wells - EDR, Reids Ferry, Crittenden	3.5	7% loss to EDR	0.24	3.26
SUFFOLK	WTWA Fluoride well - blended w/above	0.70		0.0	0.70
SUFFOLK	Holland wells	0.00	-	0.0	0.00
SUFFOLK	Whaleyville wells	0.10		0.0	0.1
SUFFOLK	Raw Water Purchase from Norfolk	6	10% loss (per contract)	0.6	5.4
SUFFOLK	Finished Water Purchase from Portsmouth				2.56
SUFFOLK	Finished Water Sale to Isle of Wight				-1.35
VIRGINIA BEACH	Stumpy Lake - Norfolk wheels	2.00	Transmission and production losses	0.2	1.8
VIRGINIA BEACH	Lake Gaston - Norfolk wheels	50.0	Transmission and production losses	5.0	45.0
SOUTHSIDE SUBTOTAL		217.93		21.97	194.61
FRANKLIN	Franklin wells	1.40		0.00	1.40
FRANKLIN	Finished Water Sale to Isle of Wight				-0.13
ISLE OF WIGHT CO.	Wells for 4 (GW permits) stand-alone CWS owned by county	0.13		0.00	0.13

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
ISLE OF WIGHT CO.	GW permit for Camptown DSD (not constructed)	0.00	est. 30% loss to RO	0.0	0.00
ISLE OF WIGHT CO.	Purchase finished water from WTW A (treated by Suffolk)				1.35
ISLE OF WIGHT CO.	Purchase finished water from Franklin				0.13
ISLE OF WIGHT CO.	Purchase finished water from Windsor				0.22
SMITHFIELD	Smithfield wells	0.85	13% Loss RO	0.1	0.75
SOUTHAMPTON CO.	Newsoms wells	0.063		0.00	0.063
SOUTHAMPTON CO.	Boykins-Branchville wells	0.15		0.00	0.15
SOUTHAMPTON CO.	Drewryville wells	0.016		0.00	0.016
SOUTHAMPTON CO.	Edgehill wells	0.024		0.00	0.024
CAPRON	Capron wells	0.025		0.00	0.025
COURTLAND	Courtland wells	0.16		0.00	0.16
IVOR	Ivor wells	0.054		0.00	0.054
CLAREMONT	Claremont wells	0.047		0.00	0.047
DENDRON	Dendron wells	0.024		0.00	0.024
TOWN OF SURRY	Town of Surry wells	0.06		0.00	0.06
WINDSOR	Windsor Wells	0.54		0.00	0.54
WINDSOR	Sale finished water to Isle of Wight				-0.22
WESTERN TIDEWATER SUBTOTAL		3.54		0.1	4.79
GLOUCESTER CO.	Beaverdam reservoir	2.0	9% loss	0.18	1.82
GLOUCESTER CO.	Gloucester wells	2.0	15% loss to RO	0.3	1.7
HAMPTON	none	0.0		0.0	0.0

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
JAMES CITY CO.	Wells in Central system (6.02 mgd) and 5 smaller systems (0.10 mgd)	6.12	20% loss	0.96	5.16
JAMES CITY CO.	Chickahominy River Intake: Max daily = 16.95 MGD; max monthly = 465.78 Mgal; max annual = 3758.82 Mgal. Eng report spec for 4, 8, and 12 MGD facility.	0.00	\$120M cost; JC will have capacity to finance the project sometime between 2023-2028; build out 2028-2032.	0.00	0.00
JAMES CITY CO.	Finished water purchase from NNWW (up to 2 MGD)				2
NEWPORT NEWS WATERWORKS	Five reservoirs and Chickahominy River intake (57 mgd); per VDH operating certificate	57.0	1% production losses from surface water sources = 0.55 MGD	0.55	54.45
NEWPORT NEWS WATERWORKS	Raw water sale to Williamsburg (2020: 2 MGD, 2030-2040: 1MGD)	-2	Deducted from raw water yield above before calculating finished yield		
NEWPORT NEWS WATERWORKS	Brackish Drought Well; 7MGD during qualifying events	7	20% RO loss = 1.4 MGD	1.4	5.7
NEWPORT NEWS WATERWORKS	Finished Water Sale to JCSA (up to 2 MGD)				-2
NEWPORT NEWS WATERWORKS	Lightfoot wells	1.0		0.00	1.0
POQUOSON	none	0.0		0.0	0.0
WILLIAMSBURG	Waller Mill reservoir, wells, and 1 MGD raw water purchase from NNW	5.14	4% production losses	0.21	4.93
YORK CO.	none	0.0		0.0	0.0
PENINSULA SUBTOTAL		78.26		3.6	74.76
HAMPTON ROADS TOTAL		299.73		25.67	274.16

Table A2. Demand Projections, items shown in red were updated in 2018

	2020				2030				2040			
Locality	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)
Chesapeake City (3-21-18)	252,396	89.82%	70.79	15.840	294,839	89.82%	70.79	17.560	315,341	89.82%	70.79	18.880
Norfolk City (2-21-18)	249,687	100%	88	21.972	258,954	100%	88	22.788	263,430	100%	88	23.182
Norfolk - Military Installations	N/A	N/A	N/A	5.000	N/A	N/A	N/A	5.000	N/A	N/A	N/A	5.000
Portsmouth City (2-7-18)	96,423	100%	118	11.440	97,293	100%	118	11.460	97,714	100%	118	11.460
Suffolk City (2-9-18)	97,615	85%	75	6.223	118,615	90%	75	8.007	128,759	95%	75	9.174
Virginia Beach City (3/14/18)	463,742	97%	70	31.488	499,784	97%	68	32.917	517,193	97%	66	33.042
Southside Subtotal	1,159,864			91.96	1,269,485			97.73	1,322,436			100.74
Franklin City	8,621	100%	133	1.147	8,706	100%	133	1.158	8,748	100%	133	1.163
Isle of Wight County (2-27-18)	39,456			1.000	47,944			4.000	52,044			5.100
Smithfield	8,546	98%	90	0.75	11,186	98%	90	0.99	13,826	98%	90	1.22
Windsor	2,778	98%	102	0.28	2,934	98%	102	0.29	3,099	98%	102	0.31
Southampton Co.	18,549	9%	123	0.205	19,642	9%	123	0.217	20,170	9%	123	0.223
Capron	185	1%	126	0.0234	196	1%	126	0.0247	202	1%	126	0.0254
Courtland	1,113	6%	112	0.1246	1,179	6%	112	0.1320	1,210	6%	112	0.1355
Ivor	371	2%	111	0.0412	393	2%	111	0.0436	403	2%	111	0.0448
Surry Co.	6,841											
Claremont	753	11%	103	0.078	791	11%	103	0.081	809	11%	103	0.083

	2020				2030				2040			
Locality	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)
Dendron	342	5%	73	0.025	360	5%	73	0.026	368	5%	73	0.027
Surry Town	684	10%	105	0.072	719	10%	105	0.075	736	10%	105	0.077
Western Tidewater Subtotal	85,461			4.0	94,050			7.0	101,615			8.0
Gloucester County (2-21-18)	37,902	42%	68	1.082	39,051	45%	68	1.22	40,200	48%	68	1.37
JCSA - All Systems (1-31-18)	80,591	70%	80.3	4.53	103,365	65%	80.3	5.39	117,983	65%	80.3	6.15
Williamsburg City (1-31-18)	15,860	100%	153	2.54	17,267	100%	153	2.64	18,171	100%	153	2.78
Hampton City	137,746	100%	93	12.810	138,575	100%	93	12.887	139,107	100%	93	12.937
James City County (NNWW service area)	10,421	79%	93	0.766	10,910	81%	93	0.822	11,428	83%	93	0.882
Newport News City (2-27-18)	184,216	100%	93	17.132	187,475	100%	93	17.435	189,567	100%	93	17.630
Poquoson City	12,339	100%	93	1.148	12,508	100%	93	1.163	12,617	100%	93	1.173
York County	71,153	96%	93	6.353	79,535	97%	93	7.175	84,915	98%	93	7.739
Peninsula Subtotal	550,228			46	588,685			49	613,987			51
Hampton Roads	1,795,552			142	1,952,221			154	2,038,040			160

Appendix B: Water Supply and Demand Projections from Water Supply Plan (2011)

Table B1. Supply Projections, taken from Water Supply Plan (2011)

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
CHESAPEAKE	Northwest River Intake	10.0	30% loss to RO	3.0	7.0
CHESAPEAKE	Northwest River wells	5.0	30% loss to RO	1.5	3.5
CHESAPEAKE	Western Branch wells	6.0	Internal system losses (backwashing , etc)	0.5	5.5
CHESAPEAKE	Raw water purchase from Norfolk of 7 MGD	7	15% loss to UF and other production processes	1.05	5.95
CHESAPEAKE	1/6 share of Lake Gaston - infrastructure needed	10.0	15% loss	1.5	8.5
CHESAPEAKE	Finished Water purchase from Norfolk				7
CHESAPEAKE	Finished Water purchase from Portsmouth				5
NORFOLK	Intown and Western Branch Reservoirs, Blackwater and Nottoway River intakes, Suffolk wells	92.5	3.3% loss in transmission and 0.8 MGD loss in production processes	3.4	76.1
NORFOLK	Raw Water Sold to Chesapeake	-7	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Raw Water Sold to Suffolk	-4.5	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Raw Water Sold to Isle of Wight	-1.5	Deducted from raw water yield above before calculating finished yield		
NORFOLK	Finished Water sold to Chesapeake				-7
PORTSMOUTH	Production wells and Speights Run, Lake Kilby, Lake Cohoon, Lake Meade (drought wells not included)	24.5	12.2% Losses in Production Processes	2.99	21.5
PORTSMOUTH	Drought Emergency Relief Wells	6.22	12.2% Losses in Production Processes	0.75	5.46

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
PORTSMOUTH	Finished Water sale to Chesapeake				-5
PORTSMOUTH	Finished Water Sale to Suffolk				-2.56
SUFFOLK	Crumps Mill Pond, Lone Star Lakes	1.2	3% loss	0.04	1.16
SUFFOLK	WTWA wells - EDR, Reids Ferry, Crittenden	7.64	7% loss to EDR	0.53	7.11
SUFFOLK	WTWA Fluoride well - blended w/above	0.70		0.0	0.70
SUFFOLK	Holland wells	0.04		0.0	0.04
SUFFOLK	Whaleyville wells	0.10		0.0	0.1
SUFFOLK	Raw Water Purchase from Norfolk	6	10% loss (per contract)	0.6	5.4
SUFFOLK	Finished Water Purchase from Portsmouth				2.56
SUFFOLK	Finished Water Sale to Isle of Wight				-1.35
VIRGINIA BEACH	Stumpy Lake - Norfolk wheels	1.30	Transmission and production losses	0.1	1.2
VIRGINIA BEACH	Lake Gaston - Norfolk wheels	50.0	Transmission and production losses	5.0	45.0
SOUTHSIDE SUBTOTAL		215.2		20.96	192.87
FRANKLIN	Franklin wells	2.88		0.00	2.88
FRANKLIN	Finished Water Sale to Isle of Wight				-0.13
ISLE OF WIGHT CO.	Wells for 8 stand-alone CWS owned by county	0.16		0.00	0.16
ISLE OF WIGHT CO.	GW permit for Camptown DSD (not constructed)	0.98	est. 30% loss to RO	0.29	0.68
ISLE OF WIGHT CO.	Purchase finished water from WTWA (treated by Suffolk)				1.35
ISLE OF WIGHT CO.	Purchase finished water from Franklin				0.13
ISLE OF WIGHT CO.	Purchase finished water from Windsor				0.22

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
SMITHFIELD	Smithfield wells	1.40		0.00	1.40
SOUTHAMPTON CO.	Newsoms wells	0.09		0.00	0.09
SOUTHAMPTON CO.	Boykins-Branchville wells	0.24		0.00	0.24
SOUTHAMPTON CO.	Drewryville wells	0.02		0.00	0.02
SOUTHAMPTON CO.	Edgehill wells	0.04		0.00	0.04
CAPRON	Capron wells	0.03		0.00	0.03
COURTLAND	Courtland wells	0.17		0.00	0.17
IVOR	Ivor wells	0.05		0.00	0.05
CLAREMONT	Claremont wells	0.05		0.00	0.05
DENDRON	Dendron wells	0.02		0.00	0.02
TOWN OF SURRY	Town of Surry wells	0.06		0.00	0.06
WINDSOR	Windsor Wells	0.54		0.00	0.54
WINDSOR	Sale finished water to Isle of Wight				-0.22
WESTERN TIDEWATER SUBTOTAL		6.73		0.29	7.8
GLOUCESTER CO.	Beaverdam reservoir	2.0	10% loss	0.2	1.8
GLOUCESTER CO.	Gloucester wells	1.3	15% loss to RO	0.2	1.1
HAMPTON	none	0.0		0.0	0.0
JAMES CITY CO.	Wells in Central system and 7 smaller systems	8.94	20% loss from 4.8 MGD BGD	0.96	7.98
JAMES CITY CO.	Finished water purchase from NNWW (up to 4 MGD)				4

OWNER	SOURCE DESCRIPTION	RAW WATER AMOUNT (MGD)	WATER LOSS DESCRIPTION	PRODUCTION LOSSES (MGD)	FINISHED WATER (MGD)
NEWPORT NEWS WATERWORKS	Five reservoirs, Chickahominy River intake, brackish wells (2 MGD obligated to Williamsburg deducted from raw water yield)	55	1% production losses from surface water sources	0.45	52.47
NEWPORT NEWS WATERWORKS	Raw water sale to Williamsburg (up to 2 MGD)	-2	Deducted from raw water yield above before calculating finished yield		
NEWPORT NEWS WATERWORKS	Brackish Drought Well; 7MGD during qualifying events	7		1.4	5.6
NEWPORT NEWS WATERWORKS	Finished Water Sale to JCSA (up to 4 MGD)				-4
NEWPORT NEWS WATERWORKS	Lightfoot wells	0.63		0.00	0.63
POQUOSON	none	0.0		0.0	0.0
WILLIAMSBURG	Waller Mill reservoir, wells, and 2 MGD (2020) and 1MGD (2030-2040)raw water purchase from NNW	5.14	4% production losses	0.21	4.93
YORK CO.	none	0.0		0.0	0.0
PENINSULA SUBTOTAL		78.01		3.42	74.51
HAMPTON ROADS TOTAL		299.94		24.67	275.18

Table B2. Demand Projections from Water Supply Plan (2011)

Locality	2020				2030				2040			
	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)
Chesapeake City	282,566	89%	97	24.394	325,045	89%	97	28.061	367,524	89%	97	31.728
Norfolk City	238,236	100%	80	19.059	239,780	100%	80	19.182	241,333	100%	80	19.307
Norfolk - Military Installations		N/A	N/A	1.000		N/A	N/A	1.000		N/A	N/A	1.000
Portsmouth City	101,576	100%	112	11.377	103,656	100%	112	11.609	105,779	100%	112	11.847
Suffolk City	105,491	83%	103	9.018	136,898	86%	103	12.126	186,808	98%	103	18.856
Virginia Beach City	437,492	97%	79	33.525	450,015	97%	79	34.485	462,897	97%	79	35.472
Southside Subtotal	1,165,361			98.37	1,255,394			106.46	1,364,341			118.2
Franklin City	9,687	100%	133	1.288	10,813	100%	133	1.438	12,071	100%	133	1.605
Isle of Wight County	12,920	39%	133	0.670	20,936	48%	133	1.337	31,008	56%	133	2.309
Smithfield	10,431	98%	141	1.441	12,972	98%	141	1.792	16,162	98%	141	2.233
Windsor	2,921	98%	102	0.292	3,390	98%	102	0.339	3,934	98%	102	0.393
Southampton Co.	22,119	9%	123	0.245	25,437	9%	123	0.282	27,253	9%	123	0.302
Capron	221	1%	126	0.0279	254	1%	126	0.0321	273	1%	126	0.0343
Courtland	1,327	6%	112	0.1486	1,526	6%	112	0.1709	1,635	6%	112	0.1831
Ivor	442	2%	111	0.0491	509	2%	111	0.0565	545	2%	111	0.0605
Surry Co.	7,810	0%	-	-	8,574	0%	-	-	9,412	0%	-	-
Claremont	859	11%	103	0.088	943	11%	103	0.097	1,035	11%	103	0.107
Dendron	391	5%	73	0.029	429	5%	73	0.031	471	5%	73	0.034
Surry Town	781	10%	105	0.082	857	10%	105	0.090	941	10%	105	0.099
Western Tidewater Subtotal	65,888			4.361	82,123			5.666	99,840			7.361

Locality	2020				2030				2040			
	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)	Locality Population Projection	% served by PWS (2011 Plan)	Ave Per Capita Water Use - gal (2004-2008)	Finished Water Demand (MGD)
Gloucester County	18,551	42%	82	0.639	23,689	46%	82	0.894	29,675	49%	82	1.192
Hampton City	150,137	100%	112	16.815	153,382	100%	112	17.179	156,698	100%	112	17.550
James City County	63,370	79%	106	5.307	81,401	81%	106	6.989	103,908	83%	106	9.142
Newport News City	197,082	100%	112	22.073	209,093	100%	112	23.418	221,836	100%	112	24.846
Poquoson City	13,333	100%	112	1.493	14,504	100%	112	1.624	15,777	100%	112	1.767
Williamsburg City	17,700	100%	245	4.337	19,000	100%	245	4.655	19,000	100%	245	4.655
York County	71,762	96%	112	7.716	81,802	97%	112	8.887	93,238	98%	112	10.234
Peninsula Subtotal	531,935			58.38	582,871			63.65	640,132			69.4
Hampton Roads	1,763,183			208.414	1,920,388			223.076	2,104,313			242.257

Appendix C: Water Sale Contracts

Table C1. Water Sale Contracts (last updated April 2020)

WATER SELLER	Water Buyer	Receiving Water System	Contract or Agreement Terms	Notes:
NORFOLK	Chesapeake	Northwest River System	Contractually obligated to purchase minimum 7 mgd; Raw Water	Contract date 12-7-2002: year 1 water rate of \$0.95/thousand gallons; every July 1st, rate is adjusted by multiplying the water rate by the greater of either the CPI Adjustment Factor as defined in Contract Exhibit B, or 100%. In no case shall the rate decrease.
NORFOLK	Chesapeake	South Norfolk System	Minimum purchase is 2 mgd; Finished Water	Contract date 12-17-2002: Rates set by Norfolk City Council, or as further established by separate contract or amendment
NORFOLK	Norfolk Navy Installations	Norfolk Naval Base	Unrestricted volume by contract;	
NORFOLK	Virginia Beach	Virginia Beach	Finished Water Norfolk treats and wheels Lake Gaston water in accordance with a cost of service contract;	Contract date 7-17-1993, amended 2-14-2001, and amended November 14, 2018: Fixed capacity charge + demand charge + commodity Charge + interest on working capital + true-up payment = average unit cost of \$1.2460 in FY94 and \$1.3559 in FY95. (unit = thousand gallons)
NORFOLK	Virginia Beach		Finished Water Raw Water	Effective January 1, 2019, Norfolk entered into a raw water sale contract with Virginia Beach for 10MGD
NORFOLK	Virginia Beach Military Installations	US Army - Fort Story, Camp Pendelton	Unrestricted volume by contract; Finished Water	
	(wheeled by Virginia Beach)	US Navy - Little Creek Amphibious Base, NAS Oceana, Dam Neck.	Unrestricted volume by contract; Finished Water	

WATER SELLER	Water Buyer	Receiving Water System	Contract or Agreement Terms	Notes:
NORFOLK	Portsmouth Navy Installation	Craney Island (fire suppression)	Unrestricted amount. Rate by ordinance; Raw Water	
NORFOLK	Western Tidewater Water Authority (WTWA): Suffolk – 75%, Isle of Wight – 25%	Suffolk Main System, Newport Development Service District, Windsor Development Service District	2014 – 3mgd; Increases 1 mgd every other year (15 mgd max); Raw Water	
NORFOLK	Portsmouth	Portsmouth	Pre-negotiated rate for up to 10 mgd, if available during droughts; Raw Water	Contract date 10-4-2002, amended 9-20-2007 and 11-4-2008: July 1, 2008 water rate of \$1.11/thousand gallons; every July 1st, rate is adjusted by multiplying the water rate by the CPI Adjustment Factor as defined in amendment 2. In no case shall the Adjustment Factor be less than 1.0.
PORTSMOUTH	Chesapeake	Western Branch System	Contractually obligated to purchase 3.65 mgd in FY2018, decreasing annually to 2 mgd in FY2022; 2 mgd for FY2023 to FY2047; Finished Water	New contract effective 7-1-2017. New contract approved by CH City Council 6-27-17.
PORTSMOUTH	Suffolk	Suffolk Main System	2.54 mgd; Finished Water	Contract date 2-16-1982, amended 8-8-1991 and 8-27-1997: The 1981 rate of \$0.60/thousand gallons increases proportionately with increases to Portsmouth residents
WTWA	Suffolk	Newport Development Service District	Finished Water	see contract details
WTWA	Isle of Wight	Suffolk Main System	6.76 mgd; Finished Water	see contract details

WATER SELLER	Water Buyer	Receiving Water System	Contract or Agreement Terms	Notes:
FRANKLIN	Isle of Wight	Camptown Development Service District	Maximum of 0.200 mgd (200,000 gallons per day, max 225,565 gallons in any one day) ; Finished Water	contract date 2-12-1998, effective 7-1-1998: same volumetric rate charged to customers in Franklin
SMITHFIELD	Isle of Wight	Gatling Pointe Subdivision	Finished Water	
WINDSOR	Isle of Wight	Windsor Development Service District	Finished Water	
NEWPORT NEWS WATERWORKS	JCSA	Central System	Bulk water contract 2009 to 2050 with automatic renewals: Up to 2 MGD; originally up to 4 MGD Finished Water	
NEWPORT NEWS WATERWORKS	Williamsburg	(one system)	Bulk water contract 2009 to 2050 with automatic renewals: Up to 2 MGD until 2024, up to 1 MGD beginning 2024 Finished Water	

Appendix D: Groundwater Permit Tiers

Last updated 2017										
Permit Holder	Permitted Withdrawal (MGD)	% Cut Below Previous Permit	% Cut Below 2012 Reported Use	Year 1 Permitted Withdrawal (Y1; MGD)	Year 10 Permitted Withdrawal (Y10; MGD)	Additional GW Withdrawal -Alt. Source	Y10 Max Potential Withdrawal (MGD)	Conditions		
								Allocations	New Monitoring Wells?	Production Well Abandonment?
City of Franklin (GW0042901)	1.4	51%	0%	1.4	1.4	Bedrock well development (limit not specified)	1.6 (growth dependent)	Tiered - Increases; Bedrock well development	Observation (up to 7)	N/A
City of Chesapeake (GW0043901)	3.51	68%	0%	3.5	3.5	3.0 (ASR)	Additional up to: + 10.0 Temporary + 2.01 (1.07) Tier 1 + 2.14 (1.07) Tier 2 + 3.0 ASR + Absorbed System	Additional Withdrawal Limits; Conjunctive use & drought relief; Alternative source development	N/A	Abandon 1 well within 2 years (currently out of service)
City of Portsmouth (GW0047400)	5.0	67%	0%	5.0 (ave.)	5.0 (ave)	N/A	5.0 (ave.) 18,306 MG total for 10-yr term	10-year allocation; Conjunctive use & drought relief; Alternative source development	Chloride (1)	Abandon 1 well by 2026
Western Tidewater Water Authority (Suffolk & Isle of Wight) (GW0045801)	4.2	50%	0%	4.2	4.2	N/A	7.6 (operational conditions)	Tiered - Increases; Groundwater Reduction Planning	N/A	Abandon 2 wells by 2022

Last updated 2017										
Permit Holder	Permitted Withdrawal (MGD)	% Cut Below Previous Permit	% Cut Below 2012 Reported Use	Year 1 Permitted Withdrawal (Y1; MGD)	Year 10 Permitted Withdrawal (Y10; MGD)	Additional GW Withdrawal -Alt. Source	Y10 Max Potential Withdrawal (MGD)	Conditions		
								Allocations	New Monitoring Wells?	Production Well Abandonment?
James City Service Authority (GW0043401)	6.0	32%	0%	6.0	6.0	N/A	8.4 (growth dependent)	Tiered - Increases; Alternative Source Development (SW intake)	Chloride (1)	Abandon 7 wells by 2026
Newport News Waterworks (GW0030201)	2.96	58%	0%	2.96 (ave)	2.96 (ave)	N/A	2.96 (ave) 10,786 MG total for 10-yr term	10-year allocation; Conjunctive use & drought relief	Chloride (1)	N/A
Town of Smithfield (GW0031801)	1.28	0%	0%	1.28	1.28	N/A	1.28	Traditional permit	Observation (14)	N/A
City of Norfolk (GW0047100)	3.74	0%	0%	3.74	3.74	N/A	3.74	10-year allocation; Conjunctive use & drought relief	N/A	N/A