

DROUGHT MONITORING TASK FORCE

Drought Status Report

May 2, 2002

The Department of Environmental Quality compiled the following drought status report from information provided by the State Climatologist, the Virginia Departments of Agriculture and Consumer Services, Health, Forestry, Emergency Management, Game and Inland Fisheries; the Virginia Cooperative Extension Service, Farm Service Agency-USDA, the National Weather Service, and the U. S. Geological Survey.

OVERVIEW

Drought conditions improved somewhat since the report of April 9, 2002. Statewide rainfall for the month of April was 91% of long term average April rainfall. Rainfall in the most drought stricken areas of the state (Northern Shenandoah Valley and Northern Virginia) approached 140% of long term average for this period. Streamflows over the majority of the Commonwealth have increased to normal or above normal levels with the notable exception of the Roanoke River basin. Increased streamflows are expected to be short lived absent periodic precipitation. It is unlikely that April rainfall produced any appreciable ground water recharge. The existing variances to reduce discharges from large reservoirs such as Smith Mountain Lake, Kerr Reservoir, and Lake Moomaw have been successful in increasing reservoir storage for future water demands. Smith Mountain Lake levels improved enough to allow an increased discharge to support the operation of the Vic Thomas Striped Bass Hatchery. Lake Moomaw is currently at full conservation pool and the discharge variance has expired. Agricultural producers have taken advantage of the current soil moisture by planting crops at a significantly faster rate than the five-year average. Farm ponds used for livestock watering and irrigation have recharged due to the March and April precipitation but are generally still at low levels. Forest fuel moisture conditions improved due to the April rainfall. As the state returns to warmer daytime temperatures over the next month, forest fuels will dry out quickly resulting in the potential for significant forest fire threats if periodic rainfall does not continue. In addition to the wildfire concerns, extended drought conditions have left forests very susceptible to insect and disease problems. Public water supplies, both ground water based and surface water based, are in relatively good condition. Ground water based public water supplies in Loudoun County, Clarke County, Shenandoah County, Warren County and Fauquier County have reported dropping levels or reduced yields. While little is known on private ground water based supplies, it is anticipated that individual domestic users, especially those that utilize water table aquifers, have been or will be impacted by low ground water levels. April rainfall significantly improved the recreational boating and fishing situation throughout most areas of the state. Trout stocking continues as scheduled throughout the Western portions of the state, and current flows are sufficient to provide trout angling/stocking through the end of the scheduled spring season (May 31).

CLIMATOLOGICAL CONDITIONS

National Weather Service

Despite heavy rainfall at the end of the month of April, precipitation totals were still between .75 and 1.00 inch below normal in the Piedmont region of Virginia.

A low-pressure system will move into New England later today (5/2). A trailing cold front will cross Virginia producing showers and thunderstorms. Rainfall amounts are forecast to average between one-quarter and one-half an inch (.25-.50). High pressure will build and cross the area Friday through Saturday as a low-pressure system develops to the south and moves off the North Carolina coast Saturday night. A slight chance for showers is possible Saturday night.

Medium range forecasts suggest a fairly wet pattern for Virginia. With an open moisture transport and a series of upper level disturbances crossing the area from the southwestern U.S., a chance for showers or thunderstorms is possible in a cycle of every 2 days over the next week to 10 days.

The latest NOAA drought monitor indicates improved conditions over the majority of the state with the exception of an increased area of D-3 (extreme drought) conditions developing in the southern Piedmont. The drought monitor is included as Appendix A. The NOAA seasonal drought outlook continues to call for likely improvement in drought conditions through July 2002 and is included as Appendix B.

Report of the State Climatologist

Above-average precipitation fell over areas of the Commonwealth most severely impacted by drought conditions in April. Drought conditions worsened in the southern Piedmont area, from Lynchburg through South Boston and Danville, where rainfall averaged approximately 50% of the long-term mean. The southern Piedmont remains impacted by significant meteorological, hydrological, and agricultural drought.

In the most severely dry region of the state, the Shenandoah Valley and the surrounding mountains, rainfall averaged approximately 140% of normal April precipitation. As a result, the threat of major late spring forest fires has been reduced considerably. This region would require approximately six consecutive weeks of very dry weather to return to forest fuel moisture levels of early March when wildfire threats were very high. Agriculture has also benefited from timely rains, although deep-soil moisture conditions are still extremely low. There have likely been minimal improvements in ground water levels because most precipitation is currently being utilized by evapotranspiration as we have entered the period of active plant growth. Pond levels have improved somewhat but they are still at the levels seen in severe droughts in this region.

Rainfall in southwestern Virginia was approximately 75% of normal during April, but this region had been wet in previous months. As a result, it is virtually free of agricultural drought, but long-term hydrologic problems remain, owing to deficits accrued in the last three to four years.

Precipitation in Tidewater Virginia has been in the normal range (94% of average) since January 1. Currently, the Palmer Drought Severity Index shows "Severe Drought" for the region; this is certainly a misstatement, which indicates the caution that must be used in interpreting Palmer Index values. These very low readings are largely a result of very dry conditions in November and December 2001. Longer term (two and three-year) accumulated precipitation is clearly within the normal range (92 and 100 percent, respectively) for this area.

Eastern Piedmont precipitation was 75% of normal in April, which, in itself, is not a very unusual value. However, two, three and six-month departures are consistent with the Palmer Index characterization of "Moderate Drought."

The Western Piedmont region varies considerably, with near-normal conditions in the northern half of the region (roughly from Lynchburg, north), and the dry conditions noted in the first paragraph of this section. The Palmer Index characterization of "Moderate Drought" in this Climatic Division represents the average of these two conditions.

Densely populated Northern Virginia has fared very well in the last two months, with 131% of average precipitation in April and 117% in the two-month March–April period. Farm and forest conditions are generally normal, while moderate (14% and 11%, respectively) deficits remain at the two and three year intervals.

Precipitation during March and April has greatly ameliorated agriculture and forest-related problems over most of the state, with the exception of the southern Piedmont of Virginia. However, moderate hydrological drought continues in Northern Virginia, and severe hydrological drought remains over the Shenandoah Valley and the southern Piedmont.

Detailed tables for precipitation totals for the past one-month to three-year periods are included in Appendix C.

Climatologically, recent continental patterns much more closely resemble those of winter half-year than of summer resulting in more general and widespread rains in the last two months. Weather forecasting models indicate this pattern will likely continue through the first third of May.

However, by mid-May, the chance that such beneficial patterns will persist becomes increasingly small. As the precipitation regime shifts from general rains to scattered thunderstorms, the chance that some areas of the state will quickly develop agricultural drought conditions is approximately 50%, based upon historical records. This is greater than the normal expectation of a 30% chance. This increased probability is due to precipitation shortages that accumulated late in 2001. The long-term precipitation shortages that have accumulated in the two year window (see Appendix C) will be slow to dissipate, so some local water supply problems, largely from private residential systems, will continue to appear throughout the summer.

PROVISIONAL ASSESSMENT OF HYDROLOGIC CONDITIONS IN VIRGINIA

United States Geological Survey

Recent precipitation events have increased streamflow at most streamgaging stations throughout the State. Streamgages in the Shenandoah, Potomac, Rappahannock, York, portions of the James, Big Sandy, and Tennessee River Basins are recording flows in the normal to above-normal range based on April streamflow statistics. The exceptions to the increased streamflow are in the central James, Chowan, Roanoke, and Kanawha River Basins where less precipitation occurred, and streamgages are recording flows in the below-normal range.

Ground-water levels in wells in Virginia have shown minimal response to the recent rains. Ground-water levels often increase after a precipitation event; however, the increase may be the result of air entrapment in the unsaturated zone rather than an increase in water-table elevations. Ground-water response time to precipitation events can vary from weeks to months for wells that monitor water-table levels.

Appendix D contains flow duration and current flow conditions for selected U.S. Geological Survey and Virginia Department of Environmental Quality surface-water gaging stations. Data are provisional and subject to revision. The normal range of flows is defined as flows in the middle two quartiles (between those flows equaled or exceeded 75 percent of the time and those flows equaled or exceeded 25 percent of the time).

Department of Environmental Quality, Status of Major Reservoirs

Smith Mountain Lake is 0.5 feet below full and slowly falling due to increased releases for striped bass spawning. Inflow is approximately 550 cfs and outflow is approximately 950 cfs. Normal striped bass spawning releases would be in the 1400 to 1600 cfs range. Current plans are to end the striped bass release on May 23, 2002 and go back to a reduced release that will stabilize the lake level while supporting downstream water quality and recreation.

Kerr Reservoir is at 299.5 feet above mean sea level and stable. The Wilmington District has been operating the Lake under reduced releases since December. The lake is about 2.5 feet below the guide curve. Inflows and outflows to the lake are much below normal, on the order of 2800 cfs.

Philpott Reservoir near Martinsville is 7.5 feet below normal and stable. Minimum releases have been cut back to one fourth of their normal condition in order to stabilize the lake level.

The three reservoirs listed above are in the Roanoke River Basin, which received below normal rainfall again in April. All of the reservoirs are under proactive management by government officials to balance upstream and downstream interests.

Lake Anna is 2.3 feet below full and has risen 0.4 feet in the past week with recent rains. This lake level is of some concern at this time of year entering a season in which low flow and high evaporation are likely to exacerbate the situation.

Lake Moomaw in western Virginia has refilled and is releasing the current inflow. The previous discharge variance has expired and DEQ has no plans to ask for another variance in the near future.

VIRGINIA AGRICULTURAL SITUATION

Virginia Department of Agriculture and Consumer Services

Local Disaster Designation Requests

With the addition of Page and Orange Counties, the number of Virginia localities that have submitted requests to the Governor for federal drought disaster designation increased to sixteen. The U.S. Department of Agriculture has completed and evaluated damage assessment reports on seven of these localities. The Farm Services Agency reports the U.S. Department of Agriculture will evaluate damage assessment reports for Rockbridge, Rockingham, Augusta, Wythe, Bland, Bedford, Nelson, Page and Orange on May 9. The Secretary of Agriculture has approved the Governor's request for disaster designation for Goochland and Prince Edward Counties. These designations include all contiguous localities.

Soil/Crop Conditions

The Virginia Agricultural Statistics Service reports that scattered showers fell throughout the Commonwealth that improved topsoil moisture but slowed the progress of fieldwork. Pastures have been progressing rapidly throughout the past few weeks. Corn planting has got off to a great start with the percentage planted significantly greater than the five-year average. Vegetable planting has progressed slowly. Tobacco planting is underway with a much greater percentage of flue cured tobacco transplanted as compared to the five-year average.

Tables describing topsoil moisture, crop condition, and crop progress are contained in Appendix E.

Virginia Cooperative Extension Service

A survey of Virginia Cooperative Extension Agriculture & Natural Resource Agents indicates that recent rains have improved surface moisture conditions throughout most of the state. Agents report that some streams that were dry are now running again. In some portions of the state ponds have recharged somewhat but they will need much more rainfall to totally recharge.

The most recent rains have not made a significant impact on ground water replenishment. Ground water supplies are far below adequate and will remain so until significant rainfall amounts occur. Ponds that are used for irrigation of crops may reach critical low levels early in the season without adequate recharging from rainfall since water table ground water levels are too low to provide recharge.

In most portions of the state there is sufficient soil moisture for corn planting. Some farmers have planted earlier than normal to take advantage of current surface soil moisture from recent rains. In portions of Southeastern Virginia and on the Eastern Shore some farmers cannot plant corn at this time because fields are too wet. In the remainder of the state field conditions are not too wet to allow access.

Agents from numerous parts of the state report that yields from the first hay cutting may be reduced by as much as 25-50%. Some farmers are reseeding hay and pasture fields as a result of the prolonged drought situation. Small grain yields will also be reduced because of lack of moisture during the latter part of 2001 and early 2002. Small grains are currently heading and timely rainfall is critical to assure normal yields.

Some livestock producers are still hauling water to livestock although the number of reports has decreased due to recent. Although some livestock producers sold animals earlier in the season because of inadequate water and feed supplies, there are no reports of continuing sales.

As temperatures increase over the next month agricultural drought impacts will quickly reappear without continued periodic precipitation.

FOREST SITUATION IN VIRGINIA

Virginia Department of Forestry

Wildfire Conditions

The Virginia Department of Forestry has experienced one of the busiest spring fire seasons in recent memory. The extended drought resulted in an earlier beginning of the spring wildfire season this year with heavy activity occurring by mid-February.

New fire activity is currently low primarily due to recent periodic rains that have contributed regular moisture over the last month. This rainfall has resulted in increased forest fuel moisture that has reduced the potential for accidental wildfire starts. Recent rainfall trends have been dominated by fronts that move out of the Great Plains and produce ample rainfall until they encounter the Appalachian Mountains. The fronts weaken as they interact with the mountain topography and either do not make much additional eastward progress, or produce only light amounts of rain as they move toward the Atlantic and Gulf coasts. This pattern of frontal passage is predicted to continue through the summer. Central Virginia is not expected to recover from the drought deficit and will continue to have increased potential for wildfires in between these brief periods of increased moisture. Should conditions persist as predicted, the spring wildfire season could be followed by a summer wildfire season, at least in central Virginia. Summer wildfire threats are not a normal occurrence in Virginia.

The spring green-up of forests in the Commonwealth will retard fire spread and help to keep wildfires from approaching the extreme levels of intensity that were present only a month or so ago. However, the green-up will not stop the dead/down fuels from igniting. These dead/down fuels dried to record levels during March and fuel moisture has only increased slightly since that time. These fuels have a significant impact on a wildfire by adding large quantities of burnable fuel to a wildfire. These larger amounts of burnable fuel result in extreme levels of fire behavior that make control more dangerous and difficult for fire suppression personnel. Only repeated significant rainfalls can alleviate this problem.

Through April 26, the VDOF has responded to 1211 wildfires covering over 8877 acres. This spring activity represents 16 % more wildfires over the next closest period in the last ten years, and 40% more acreage burned. Compared to the five-year average, this spring represents slightly less than double the average for number of wildfires, and slightly more than double the average for acreage burned. The extended drought has caused more wildfires that are much more difficult and dangerous to control, and therefore burn more acreage. Appendix F contains a graph detailing wildfire activity over the last six years.

The VDOF continues to remain in contact with other state and federal wildfire cooperators on this developing situation. Preparations are in place to deal with potential wildfire problems that are expected to continue into the summer and fall.

Forest Health Concerns

The extended drought conditions have left forests very susceptible to insect and disease problems. This is a long-term problem that will not be easily solved by a few passing showers. Drought induced stress increases the mortality associated with gypsy moth and other forest pests and pathogens, as trees are less likely to produce the normal defensive mechanisms. Some pests are only able to overwhelm a tree's defenses when the tree is weakened by drought.

Virginia is overdue for a southern pine beetle outbreak and trees have essentially no resistance to infestation right now. Current market conditions for potential salvage material are poor. An outbreak now would result in major financial losses to forest landowners.

PUBLIC WATER SUPPLY SYSTEMS

Virginia Department of Health

Public water supply conditions have seen improvement in the central and southeast portions of the Commonwealth. While surface based systems showed improved conditions in the Shenandoah Valley, several small ground water based systems are exhibiting reduced water levels or yields.

The large municipalities of the greater Richmond area held meetings to discuss water conservation. Voluntary conservation on a regional basis was urged by press release effective April 1, 2002. In addition, Clarke County Sanitary Authority (Boyce-Millwood), Stoney Creek Sanitary District, Williamsburg, Portsmouth, Chesapeake, Suffolk, Leesburg, Town of Hamilton, Town of Lovettsville, Lake Caroline, Waterloo Estates, and Stafford continue voluntary water conservation efforts. Improved flows in the Shenandoah River allowed Front Royal to lift voluntary restrictions. The City of Roanoke, Craigsville, Spotsylvania County, and the City of Fredericksburg continue with mandatory water conservation requirements.

Ground water based public water supplies in Clarke, Loudoun, Fauquier, Shenandoah, and Warren County have reported dropping levels or reduced yields. Reports of reduced flows from springs have been verified. Other waterworks around the state have reported few or no adverse impacts due to ground water level declines.

Appendix G contains detailed reports of public water supply conditions in the six field offices. The Abingdon Field Office has no reported problems or issues with either ground water or surface water sources.

The Virginia Department of Emergency Management has revised the procedures for reporting private potable supply problems to include all current contact information. These procedures provide a consistent method for local governments to report private water supply problems and to seek assistance in correcting those problems. The procedures will be placed on the VDEM website and localities will be informed of the location of the procedures.

FISHERIES AND RECREATIONAL IMPACTS

Virginia Department of Game and Inland Fisheries

The series of rainfall events over the past two weeks significantly improved the recreational boating and fishing situation throughout most areas of the state. The notable exception is the Roanoke River basin. Smith Mountain Lake remains slightly below normal spring pool elevation. VDGIF is operating the Vic Thomas Hatchery at Brookneal utilizing the minimum release flows possible from Leesville Reservoir. The reduced flows are also limiting boating and fishing on the Roanoke River.

Trout stocking continues as scheduled throughout the Western portions of the state, and current flows are sufficient to provide trout angling/stocking through the end of the scheduled spring season (May 31).

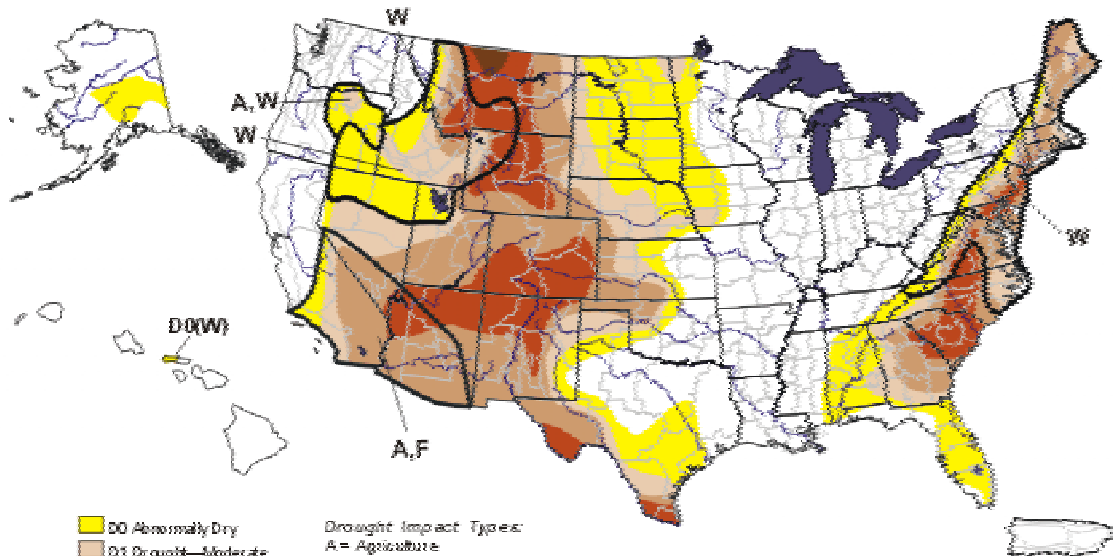
VDGIF remains concerned over the potential impact of low ground water levels on the Department's five trout hatcheries. Absent regular periodic precipitation events, water supply at these facilities fluctuates rapidly due to limited ground water availability.

Department staff continues to coordinate with DEQ and reservoir managers on FERC variances and discharges in order to limit future impacts of a continued drought situation.

APPENDIX A

U.S. Drought Monitor April 30, 2002

Valid thru: EOP



- D0 Abnormally Dry
- D1 Drought—Moderate
- D2 Drought—Severe
- D3 Drought—Extreme
- D4 Drought—Exceptional

Drought Impact Types:

A = Agriculture

W = Water (Hydrological)

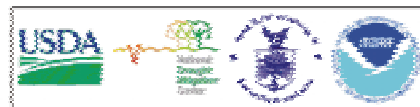
F = Fire danger (Wildfires)

⚡ defines dominant impact

(No type = All 3 impacts)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See a accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, May 2, 2002

Author: Richard Heim/Scott Stephens/WDA&NCDC

National Drought Summary – April 30, 2002

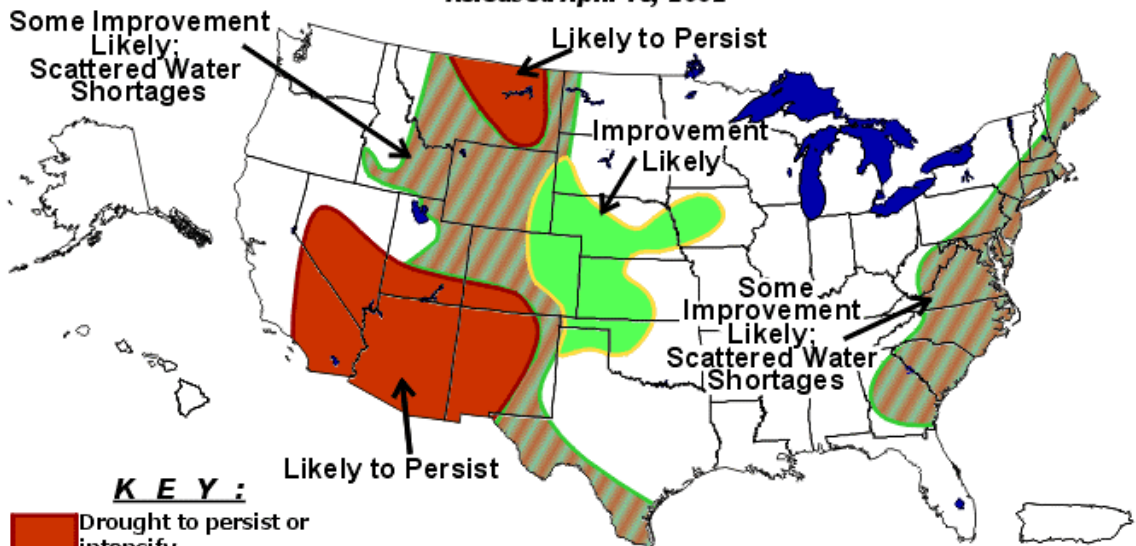
The East: Good 1 to 3 inch rains occurred in eastern West Virginia to Washington DC, across southern Delaware and southern New Jersey, and centered around northeast Pennsylvania, with some improvement in soil moisture conditions. Daily rainfall records were broken April 28 with 1.68 inches falling at Dulles IAP and 1.43 inches falling at Baltimore's BWI airport. However, 6-month and 12-month precipitation were still well below average and New York City reservoirs were rising only at the rate of climatology and were still in the drought warning category. Consequently, the D3 area was pinched in two over northern Virginia. Some contraction was made to the drought boundaries from West Virginia to New York City, but no dramatic improvements were made.

APPENDIX B



U. S. Seasonal Drought Outlook Through July 2002

Released April 18, 2002



- KEY:**
- Drought to persist or intensify
 - Drought ongoing, some improvement
 - Drought likely to improve
 - Drought development likely

Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are schematically approximated from the Drought Monitor. For weekly drought updates, see the latest Drought Monitor map and text.

APPENDIX C

One, two, three, six, twelve, twenty four, and thirty six month
precipitation departures by Climatological Division.

One Month Precipitation Departures

Climatological Division	APRIL 2002	APRIL NORMAL	APRIL DEPARTURE	APRIL % DEPARTURE
Tidewater	3.20	2.99	0.21	107%
Eastern Piedmont	2.30	3.08	-0.78	75%
Western Piedmont	2.10	3.43	-1.33	61%
Northern	4.10	3.14	0.96	131%
Central Mountain	4.20	3.06	1.14	137%
Southwestern	2.70	3.64	-0.94	74%
Statewide	3.00	3.29	-0.29	91%

Two Month Precipitation Departures

Climatological Division	MARCH-APRIL 2002	MARCH-APRIL NORMAL	MARCH-APRIL DEPARTURE	MARCH-APRIL % DEPARTURE
Tidewater	7.00	6.88	0.12	102%
Eastern Piedmont	6.00	6.82	-0.82	88%
Western Piedmont	6.10	7.29	-1.19	84%
Northern	7.40	6.35	1.05	117%
Central Mountain	7.60	6.29	1.31	121%
Southwestern	8.40	7.39	1.01	114%
Statewide	7.00	7.02	-0.02	100%

Three Month Precipitation Departures

Climatological Division	FEB-APRIL 2002	FEB-APRIL NORMAL	FEB-APRIL DEPARTURE	FEB-APRIL % DEPARTURE
Tidewater	8.30	10.24	-1.94	81%
Eastern Piedmont	6.90	10.08	-3.18	68%
Western Piedmont	6.90	10.59	-3.69	65%
Northern	7.90	9.04	-1.14	87%
Central Mountain	8.40	8.98	-0.58	94%
Southwestern	9.30	10.69	-1.39	87%
Statewide	7.90	10.02	-2.12	79%

Six Month Precipitation Departures

Climatological Division	NOV 2001 - APRIL 2002	NOV-APRIL NORMAL	NOV-APRIL DEPARTURE	NOV-APRIL % DEPARTURE
Tidewater	15.19	20.26	-5.07	75%
Eastern Piedmont	12.46	20.11	-7.65	62%
Western Piedmont	13.10	20.42	-7.32	64%
Northern	11.74	18.18	-6.44	65%
Central Mountain	12.60	17.51	-4.91	72%
Southwestern	15.97	20.17	-4.20	79%
Statewide	13.80	19.18	-5.38	72%

Twelve Month Precipitation Departures

Climatological Division	MAY 2001 - APRIL 2002	1 - YEAR NORMAL	1 - YEAR DEPARTURE	1 - YEAR % DEPARTURE
Tidewater	36.57	43.65	-7.08	84%
Eastern Piedmont	32.35	43.27	-10.92	75%
Western Piedmont	33.38	44.76	-11.38	75%
Northern	34.34	40.75	-6.41	84%
Central Mountain	32.08	39.38	-7.30	81%
Southwestern	41.60	43.30	-1.70	96%
Statewide	35.42	42.21	-6.79	84%

Twenty Four Month Precipitation Departures

Climatological Division	MAY 2000 - APRIL 2002	2 - YEAR NORMAL	2 - YEAR DEPARTURE	2 - YEAR % DEPARTURE
Tidewater	80.13	87.30	-7.17	92%
Eastern Piedmont	69.19	86.54	-17.35	80%
Western Piedmont	68.39	89.52	-21.13	76%
Northern	70.04	81.50	-11.46	86%
Central Mountain	69.32	78.76	-9.44	88%
Southwestern	76.71	86.60	-9.89	89%
Statewide	72.76	84.42	-11.66	86%

Thirty Six Month Precipitation Departures

Climatological Division	MAY 1999 - APRIL 2002	3 - YEAR NORMAL	3 - YEAR DEPARTURE	3 - YEAR % DEPARTURE
Tidewater	134.05	130.95	3.10	102%
Eastern Piedmont	114.01	129.81	-15.80	88%
Western Piedmont	111.30	134.28	-22.98	83%
Northern	108.84	122.25	-13.41	89%
Central Mountain	105.45	118.14	-12.69	89%
Southwestern	112.58	129.90	-17.32	87%
Statewide	115.36	126.63	-11.27	91%

APPENDIX D

Flow duration and current flow conditions for selected U.S. Geological Survey and Virginia Department of Environmental Quality surface-water gaging stations

	MINIMUM DAILY FLOW, PERIOD OF RECORD (CFS)	MINIMUM APRIL FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR APRIL DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT CONDITIONS FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								April 30, 2002
<u>SHENANDOAH RIVER BASIN</u>								
South River near Waynesboro, Va.	17	37	30	24	106	155	265	86/85
South Fork Shenandoah River at Front Royal, Va.	107	442	344	235	1,154	1,665	2,785	2,900/25
North Fork Shenandoah River at Cootes Store, Va.	0.2	20	3.2	0.77	88	167	348	680/10
North Fork Shenandoah River near Strasburg, Va.	35	139	-	-	394	610	1,091	1,430/20
<u>POTOMAC RIVER BASIN</u>								
Goose Creek near Leesburg, Va.	0.4	46	12	2.5	224	347	577	570/25
<u>RAPPAHANNOCK RIVER BASIN</u>								
Rappahannock River at Remington, Va.	2.9	182	50	11	482	754	1,186	1,160/25
Rapidan River near Culpeper, Va.	2.2	167	-	-	376	532	865	640/40
<u>YORK RIVER BASIN</u>								
Pamunkey River near Hanover, Va.*	47	255	-	-	674	998	1,636	460/90
Mattaponi River near Beulahville, Va.	.78	164	48	14	447	740	1,224	400/80

	MINIMUM DAILY FLOW, PERIOD OF RECORD (CFS)	MINIMUM APRIL FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR APRIL DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT CONDITIONS FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								April 30, 2002
JAMES RIVER BASIN								
Jackson River near Bacova, Va.	13	49	26	20	105	172	296	780/5
Potts Creek near Covington, Va.	15	50	24	17	119	172	308	345/20
Cowpasture River near Clifton Forge, Va.	40	130	73	54	324	503	935	2,200/80
Craig Creek at Parr, Va.	25	85	43	31	259	390	712	830/20
James River at Buchanan, Va.*	257	615	378	271	1,700	2,512	4,431	9,850/10
Maury River near Buena Vista, Va.	22	148	89	62	435	683	1,225	2,000/15
Hardware River below Briery Run near Scottsville, Va	0.1	28	24	7.5	89	131	203	26/>95
Rivanna River at Palmyra, Va.	5.2	162	-	-	450	659	1,098	773/40
James River at Cartersville, Va.	330	1,760	1,120	584	5,517	7,823	12,878	6,450/65
Appomattox River at Farmville, Va.	6.3	84	52	21	179	254	394	117/95
Appomattox River at Mattoax, Va.	13	197	86	30	441	635	1,100	213/>95
Chickahominy River near Providence Forge, Va.	0.07	36	16	4.0	181	282	507	152/85
CHOWAN RIVER BASIN								
Nottoway River near Sebrell, Va.	14	253	82	24	920	1,525	2,830	281/>95
Blackwater River near Franklin, Va.	0.07	16	-	-	426	712	1,194	244/90
Meherrin River near Lawrenceville, Va.	4.2	124	52	16	310	444	720	118/>95

	MINIMUM DAILY FLOW, PERIOD OF RECORD (CFS)	MINIMUM APRIL FLOW, PERIOD OF RECORD (CFS)	7Q2 (CFS)	7Q10 (CFS)	PERCENT OF TIME FLOW EQUALED OR EXCEEDED FOR APRIL DAILY MEAN FLOWS (CUBIC FEET PER SECOND)			CURRENT CONDITIONS FLOW (CFS)/ DURATION (PERCENT)
					75%	50%	25%	
								April 30, 2002
ROANOKE RIVER BASIN								
Roanoke River at Roanoke, Va.*	19	74	58	35	255	379	630	165/95
Pigg River near Sandy Level, Va.	25	164	96	47	242	348	500	127/>95
Roanoke River at Randolph, Va.*	179	631	847	426	1,947	3,058	4,986	1,830/80
Dan River at Paces, Va.	244	1,020	-	-	1,893	2,802	4,198	1,040/>95
Hyc0 River near Denniston, Va.*	2.5	26	-	-	102	174	400	12/>95
KANAWHA RIVER BASIN								
New River at Allisonia, Va.	453	1,100	1,040	725	2,575	3,600	5,220	1,850/>95
Little River at Graysontown, Va.	47	110	109	69	279	380	543	203/95
Walker Creek at Bane, Va.	24	76	44	33	234	360	603	276/65
BIG SANDY RIVER BASIN								
Russell Fork at Haysi, Va.	0.2	30	8.7	1.0	202	338	606	516/30
TENNESSEE RIVER BASIN								
South Fork Holston River near Damascus, Va.	40	146	99	73	395	558	844	379/80
North Fork Holston River near Saltville, Va.	2.0	70	34	24	209	301	487	198/75
Clinch River at Cleveland, Va.	37	129	81	54	465	688	1,167	567/65
Powell River near Jonesville, Va.	18	118	42	24	349	537	895	441/65
* indicates some regulation								

APPENDIX E

Virginia Agriculture Statistic Services report of topsoil moisture,
crop condition and crop progress.

TOPSOIL MOISTURE PERCENT

Week Ending	Very Short	Short	Adequate	Surplus	
April 28	2%		20%	68%	10%
April 21	3%		30%	61%	6%
April 14	4 %		33%	58%	5%
April 7	4%		25%	68%	3%
March 31	4%		23%	69%	4%

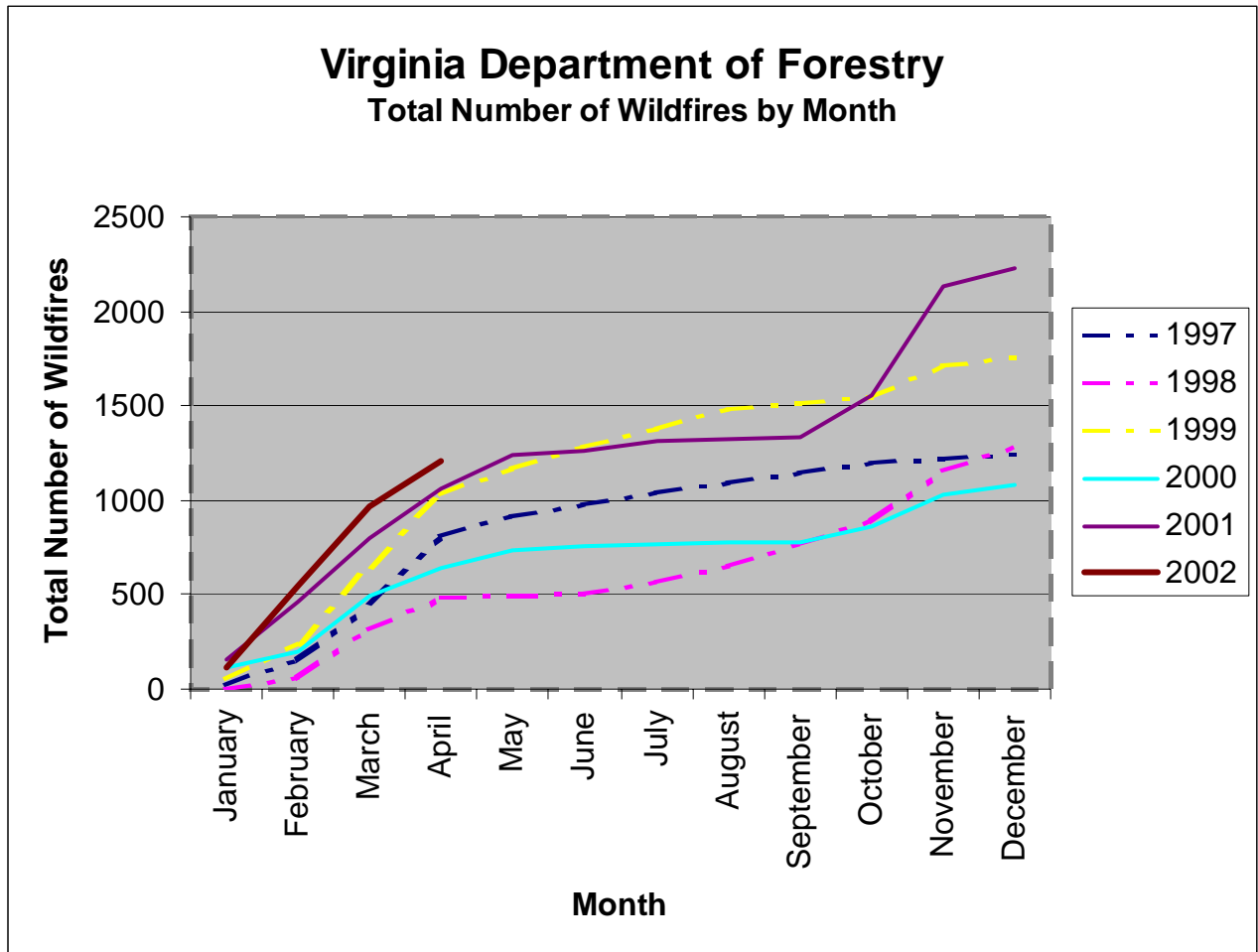
CROP CONDITION PERCENT

Crop	Very Poor	Poor	Fair	Good	Excellent
Pastures	4%	16%	38%	36%	6%
Livestock	0%	4%	23%	64%	9%
Winter Wheat	3%	15%	35%	40%	7%
Barley	5%	17%	37%	38%	3%
Other Hay	5%	15%	43%	31%	6%
Alfalfa Hay	1%	8%	42%	41%	8%
Tobacco Greenhouse	0%	0%	10%	69%	21%
Tobacco Plant Beds	0%	0%	25%	70%	5%
Apples	1%	9%	29%	60%	1%
Peaches	21%	10%	47%	21%	1%
Summer Potatoes	0%	0%	30%	50%	20%

CROP PROGRSS PERCENT - WITH COMPARISONS

Crop	This Week	Last Week	Last Year	5 Year Average
Corn Planted for Grain	63%	43%	50%	36%
Corn Emerged	44%	NA	NA	2%
Winter Wheat Headed	51%	21%	NA	NA
Cotton Planted	30%	6%	25%	14%
Peanuts Planted	14%	4%	7%	5%
Flue Cured Tobacco Transplanted	13%	1%	2%	1%
Soybeans Planted	2%	NA	1%	1%

APPENDIX F



APPENDIX G

Virginia Department of Health Field Office Reports for Public Water Systems

(Note: The first digit in the PWSID number indicates the field office location of the waterworks. PWSID 2770650 is located in the Lexington Field Office, etc.)

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
2770650	Roanoke City - Carvins Cove	Carvins Cove Reservoir/Tinker Creek/Catawba Creek	M	S: Reservoir levels 23.8' below spillway - situation steadily worsening; however, recent rains have helped some. Partial Mandatory restrictions imposed when reservoir level is between 22 and 26 feet below spillway. (Restricts outdoor usage between 10 AM and 7 PM). City has option of purchasing water from consecutive system. (Stage 3)
2015150	Craigsville		M	S: Craigsville spring production off-well production off-construction nearing completion of interconnecting water line with Augusta Springs.
2015575	South River S.D. (ACSA)	Coles Run	N	S: Coles Run reservoir level down 5-6 feet-no impact on system due to multiple sources.
2017300	Millboro	Millboro Spring	N	B: Recent rains have improved spring flows. Several large leaks have also been found and repaired.
2091150	Monterey		N	B: Monterey well production off. New well was constructed and is in operation. Situation is improving.
2790600	Staunton		N	S: Staunton-Middle River flow reduced.
2043250	Boyce-Millwood	Prospect Hill Spring	V	S: Spring yield is down from normal historical levels. Voluntary measures instituted to reduce water demand. Presently exploring options to eliminate spring bypassing and development of additional water sources.
2171250	Stoney Creek Sanitary District		V	S: Well yield is off. Authority has reduced pumping capacity by 40% based on lower water table levels. Process of developing new 350 gpm well and water treatment plant.

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
2187406	Front Royal		N	B: Lifted water use restrictions in accordance with VWPP requirements. Conservation controls implemented at 30% (voluntary), 17% (mandatory), 15% (emergency), and 13% (rationing) of mean stream flow based on 14-day running average. At present, 14-day running average stream flow is 40% of mean stream flow.
2003250	Albemarle County / Crozet	Beaver Creek Reservoir	N	B: Beaver Creek Reservoir is currently down 5.25 feet from normal "full". The previous all time low water level on record (Feb. 2002) was 8 feet below normal "full".
2003600	Charlottesville/Albermarle County	Sugar Hollow (Observatory WTP)	N	B: The Sugar Hollow reservoir (Observatory WTP) is full and should be returned to service shortly. Ragged Mountain reservoir is 6.75 feet below normal. Overall, source water availability is at 92.5% of "full available capacity" (this includes both the South Rivanna system and the Sugar Hollow/Ragged Mountain system).
2003725	Charlottesville/Albermarle County	South Rivanna (South Rivanna WTP)	N	B: Their main reservoir-South Rivanna (South Rivanna WTP) is full and overflowing.
2065250	Fluvanna Correctional Center	Mechunk Creek	N	B: The raw water impoundment now has about 80% (28 MG) of its 35-MG capacity in water stored and the level is increasing. The Fluvanna Correctional Center is withdrawing water from Mechunk Creek due to the recent rainfall and their new DEQ permit for increased withdrawals. The facility is using approximately 150,000 GPD of finished water while they are using their smaller raw water pump to pump into the reservoir.
2125650	Schulyer	Johnson's Branch	N	B: The Johnson's Branch flow is back to normal.
2187522	High Knob Subdivision	Springs and wells	N	S: Spring yields have dropped significantly and wells are being increasingly relied upon to meet water demand.
3700500	Newport News	Little Creek, Diascund, Skiffes Creek, Harwoods Mill and Lee Hall Reservoirs	N	B: As of 04/25/02, reservoirs were 94 % full and rising (in the previous report, the reservoirs were 93 % full). RO plant running at 2.0 MGD. No voluntary or mandatory conservation measures in effect at this time.

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
3830850	Williamsburg	Waller Mill Reservoir	V	B: As of 04/24/02, Waller Mill reservoir is 10 inches below the primary spillway (in the previous report it was 11 inches below the primary spillway). Voluntary conservation measures are in effect as of March 30, 2002.
3650150	Ft. Monroe	Big Bethel Reservoir System	N	S: The water plant was shut down in mid-December for replacement of valves, and switched to Newport News water. Plant is not back on line yet.
3095490	James City Service Authority Central System		N	S: No significant impact on water levels in wells.
3670800	Virginia-American, Hopewell	Appomattox River/James River	N	S: No problems with water quantity. Water quality is still fluctuating with changes in the tide. Situation is Stable.
3183550	Jarratt	Nottoway River	N	S: No quality or quantity problems noted. Situation is Stable.
3595250	Emporia	Meherrin River	N	S: The reservoir levels are still at "normal". No recent restrictions to power plant. Situation is Stable.
3710100	Norfolk	Lake Prince, Lake Burnt Mills, Western Branch reservoir, Nottoway River, Blackwater River, 4 western wells; Little Creek reservoir, Lakes Smith, Lawson, Whitehurst, and Wright. Lake Gaston.	N	S: As of 04/22, reservoirs are at 95.2% of total capacity (reduction from 95.8% on 04/08). Historic reservoir capacity at this time of year is 96.2%. Avg. pumping from Lake Gaston = 23.1 MGD; Blackwater River = 0 MGD (pump off 04/09); Nottoway River = 0 MGD (pump off 04/09). Western Branch reservoir 2.0 ft below spillway; other reservoirs flowing over spillways at 0.1 ft each. Wells are OFF. Not currently considering conservation measures, but that could change with continued dry weather.
3740600	Portsmouth	Lakes Cohoon, Meade, Kilby, and Speights Run	V	S: As of 04/22, reservoirs are at 90% of useful capacity. This is a (-) 1% change since 04/15. Median capacity for this time of year is 100%, average capacity is 99% (period of 1969-2001). Both emergency wells are OFF. Estimated 219 days of storage remaining at current pumpage (14.8 MGD) and no rainfall. City Council voted to establish Voluntary Conservation at meeting of 11/27/01. The restrictions took effect on 11/30/01.

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
3550050	Chesapeake - Western Branch system	Western Branch system	V	S: This portion of the city is consecutive to (receives water from) the city of Portsmouth. Because Portsmouth decided to go on voluntary restrictions, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3550052	Chesapeake - South Norfolk system	South Norfolk system	V	S: This portion of the city is consecutive to (receives water from) the city of Norfolk. Because Portsmouth decided to go on voluntary restrictions, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3550051	Chesapeake - NW River system	NW River system	V	S: As of 4/25, chlorides levels in the Northwest River are below average and well water levels have recovered almost 100 %. When they inject into the aquifer, the well levels increase. Plant production has been normal. Because a portion of the city (a separate system from the NW River system) is served from Portsmouth, Chesapeake has decided to follow Portsmouth's lead, for ALL residents of the city. City Council voted to establish Voluntary Conservation at the meeting on 11/27/01. The restrictions took effect on 11/30/01.
3800805	City of Suffolk	Central System	V	S: As of 4/25, reservoir system is 90% full in Crumps Mill. This is a 5% decrease from the last report. Lone Star Lakes is at 94% full. An increase of 5%. Lone Star makes up the majority of the Northern Lakes. The Southern Lakes were at 52.5%. This is a 10% increase from the last report. The city can pump from this reservoir to Lone Star if need. The city also purchase finished water from Portsmouth, which enters the central system in downtown Suffolk. As such, this system has followed the lead of

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
				the Portsmouth system and has adopted Voluntary Conservation. Suffolk will rescind Voluntary Conservation following Portsmouth's lead but not until the EDR is at full capacity. Situation is stable.
3800787	City of Suffolk	Route 17 Corridor	V	S: This system is consecutive to (purchases water from) the Portsmouth system. As such, this system has followed the lead of the Portsmouth system, and has adopted Voluntary Conservation. If Portsmouth goes to Mandatory Conservation, Suffolk will probably switch the supply source to their Central System (groundwater).
4041845	Swift Creek WTP (Chesterfield County)	Swift Creek Reservoir	V	S: The reservoir level is 174.5 feet, which is 2.5 feet below the top of the dam. The level is the same as it was 2 weeks ago. The WTP has cut production from 6 MGD to 3 MGD to save reservoir capacity. Additional water is being purchased from the 46-MGD ARWA WTP and the 132-MGD City of Richmond WTP, as needed.
4041035	Appomattox River Water Authority	Lake Chesdin	N	S: The on-site hydroelectric plan is using most of the overflow, so that there is only a trickle going over the dam. Reportedly, the hydroelectric plant can use up to 7" of overflow. The situation is about the same as it was two weeks ago. There are no drought-related restrictions on the production of the WTP.
4075735	James River Correctional Center	Beaverdam Creek and the James River	N	W: The water level in Beaverdam Creek is currently 3 inches above the top of the dam, which is 1.5 inches lower than it was two weeks ago.
4075630	Pagebrook (Goochland)	Groundwater	N	W: Sydnor continues to haul about one tanker load (approximately 2500 gallons) every two weeks.
4073311	Gloucester	Beaverdam Reservoir	N	S: The Beaverdam Reservoir water overflow elevation is 40.5. The reservoir is full and overflowing. The water level was 40.63 on April 16, 2002. Note that about a million gallons of water is allowed to flow through the reservoir every day.
all County owned systems	Hanover County	North Anna River , wells, and purchased water from the City of Richmond	V	S: Letters mailed to customers with conservation tips. In addition, general unidirectional flushing program has been

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
				discontinued.
4760100	City of Richmond	James River	V	S: The James River was still very low for this time of year, up until the rains of the past few days. River flows are now up somewhat but could subside just as quickly. Richmond is having no problems with water withdrawals.
5007030	Amelia Academy	Well No.1(bored)	N	B: No reported problems since October.
5009050	Town of Amherst	Buffalo River	N	S: River has overflow.
5009250	Amherst County Service Authority	Graham Creek Res., Harris Creek	N	S: Drawing completely from creek - reservoir full.
5019250	Eagle Eyrie	Unnamed Reservoir	N	S
5019400	High Point Subdivision	Smith Mountain Lake	N	S
5025450	Town of Lawrenceville	Great Creek	N	S: Great Creek Reservoir full
5029085	Buckingham County Waterworks	Troublesome Creek Reservoir	N	W: Reservoir full, 0.5 inches of overflow.
5031050	Town of Altavista	Staunton River, Reed Creek	N	S
5031150	CCUSA	Otter River	N	W: River is 11" down.
5031175	Town of Brookneal	Phelps Creek Reservoir	N	S: Reservoir full.
5031200	Dan River, Inc. - Brookneal Plant	Falling River	N	S: River has overflow.
5067840	Town of Rocky Mount	Blackwater Creek	N	S: But far below normal flow for this time of year.
5083550	Town of Halifax	Banister River	N	S
5089376	Fieldcrest Cannon WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5089487	Marrowbone Cr. WTP	Marrowbone Creek	N	S: Currently 2.5" over check dam.
5089852	Upper Smith River WTP	Smith River	N	S: Flow subject to release from Philpott Dam.
5111450	Town of Kenbridge	Flat Rock Creek & reservoir	N	S: Reservoir full.
5111800	Town of Victoria	Nottoway Falls & Lunenburg Lake	N	S: Reservoir full.
5117310	Town of Clarksville	Kerr Lake	N	B: Level up, 1.0 feet below normal pond.
5117800	Town of South Hill	Meherrin River	N	S
5135160	Town of Crewe	Lazeretto Creek/Crystal Lake	N	S: Reservoir full.
5141640	Town of Stuart	South Mayo River	N	S
5143114	Town of Chatham	Cherrystone Creek	N	S
5143210	Town of Gretna	Georges Creek	N	S: Reservoir is full.
5515050	City of Bedford	Stoney Creek Reservoir	N	S
5590100	City of Danville	Dan River, Schofield Dam	N	S: Still far below normal for this time off year
5680200	City of Lynchburg	Pedlar Reservoir	N	B: Pedlar Reservoir is about 26" down. City drawing entirely from reservoir since March 3.
5690400	City of Martinsville	Beaver Creek Reservoir	N	S: Reservoir level has increased as a result of area rainfall received--was down 4.2' as of 4/8/02---was down 4.4' on 3/28/02
5780600	Town of South Boston	Dan River	N	S

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
6059500	FCWA-Lorton/Occoquan WTPs	Occoquan Reservoir	N	S: Reservoir 95% full, 7.63billion gallons usable storage. All of FCWA service area is on "watch" status.
6059501	FCWA-Corbalis WTP	Potomac River	N	S: Jennings Randolph and Little Seneca reservoirs on the Potomac River are both 100% full. Flow in Potomac River at Little Falls (downstream of the Washington DC intake) is currently 3736 MGD.
6600100	City of Fairfax	Goose Creek/Beaver Dam	N	S: Water Level Status: Flowing over the dam at Goose Creek and full at Beaver Dam reservoirs.
6107600	Purcellville	Hirst Reservoirs	N	S: Water Level 1.3 feet below full. Town Council established "watch" status several weeks ago. Town council considering move to warning level.
6685100	City of Manassas	Lake Manassas (Broad Run)	N	S: Current Water Level 287.19 feet; Max is 290 feet.
6153675	Quantico- Mainside	Lunga Reservoir/ Breckenridge reservoir	N	S: Water Level: Lunga 13 inches below overflow and Breckenridge full.
6107300	Leesburg	Potomac River	V	S: Current river levels at 186.50 feet. Normal level is 187.50 feet. Leesburg intake is located upstream of the FCWA and Washington DC Intakes. Signs requesting voluntary conservation have been placed around town and on town web-site.
6107150	Hamilton	GW	V	S: Groundwater levels and system demands currently stable. In process to add additional well.
6107400	Lovettsville	GW	V	S: Groundwater levels and system demands currently stable. Voluntary conservation in effect.
6047500	Town of Culpeper	Lake Pelham	N	S: No problems at this time. Reservoir is overflowing.
6061600	Town of Warrenton	Warrenton Reservoir	N	S: No problems at this time. Reservoir is near overflow.
6113200	Town of Madison	White Oak Run	N	S: Very low stream flows observed, but no impact on water treatment plant to this point. Considering implementing conservation measures.
6137500	Town of Orange	Rapidan River	N	S: Very low stream flows observed, but no impact on water treatment plant to this point. Considering implementing conservation measures.
6137500	Wilderness WTP	Rapidan River	N	S: Very low stream flows observed, but no impact on water treatment plant to this point. Considering implementing conservation measures.

PWSID 1-Abingdon 2-Lexington 3-Southeast VA 4-East Central 5-Danville 6-Culpeper	Waterworks	Source Name	Restrictions N-No M-Mandatory V-Voluntary	Situation B-Better, S-Same, W-Worse
6061665	Waterloo Estates	Groundwater (5 wells)	V	S: Decrease in well production has led to a request for residents to voluntarily conserve water beginning 3/26/02.
6033425	Lake Caroline	Lake Caroline	V	S: Lake Caroline is 9" below normal. Conservation measures in place.
6177280, 6177300	Spotsylvania County	Ni River Reservoir and Motts Run/Rappahannock River	M	S: Spotsylvania County declared a water emergency in mid November and instituted mandatory conservation (vehicle washing at homes not allowed). Ni River Reservoir is 4.4 feet below normal. Motts Run Reservoir is 5.7 feet below normal. Increased flow in Rappahannock River has allowed county to pump 30 million gallons into Motts Run Reservoir.
6630050	City of Fredericksburg	Motts Run/Rappahannock River	M	S: City of Fredericksburg (consecutive system to Spotsylvania County) has asked for mandatory conservation based on Spotsylvania County's action.
6179100, 6179775	Stafford County	Smith Lake and Abel Lake	V	S: Stafford County has asked residents to voluntarily conserve water. Smith Lake is 6 feet 10 inches below normal and Abel Lake is 3 feet 10 inches below normal.