

# Chester County Water Ways

A Bi-monthly Publication of the  
Chester County Water Resources Authority  
April 2006

## Drought Watch Declared for all of Pennsylvania

**O**n April 11, 2006, PADEP Secretary Kathleen A. McGinty placed all of Pennsylvania's 67 counties under a drought watch and called on residents to voluntarily reduce water use by 5 percent. A drought watch is the lowest of three levels of drought status, and the focus during a drought watch is on continued monitoring, awareness and preparation for response if conditions worsen.

Throughout much of Chester County, rainfall in March 2006 was under one-inch, with only 0.6 inches reported by the Middle Atlantic River Forecast Center. This is a 3.4-inch deficit when compared to the normal rainfall of 4.0-inches. In addition to below normal precipitation, ground water and surface water levels are

*(continued on page 2)*



*During the drought in 1999, farms throughout Chester County felt the burden of stress and damage to crops due to the drought.*

### In this Issue

**1**  
**Drought Watch Declared for all of Pennsylvania**

**3**  
**Conservation Tips**

**4**  
**Hydro Conditions Reservoirs**

**5**  
**Precipitation**

**6**  
**Ground Water Levels**

**7**  
**Stream Flows**

**8**  
**Draft Pennsylvania Stormwater BMP Manual Released for Public Comment**

With regard to Chester County, two agencies have the authority to declare drought conditions: the Pennsylvania Department of Environmental Protection and the Delaware River Basin Commission.

Everyone should actively look for ways that they can reduce water use.



Illustration courtesy of Delaware River Basin Commission

*(Continued from page 1)*

also below normal levels and have been declining. Stream flows have dropped sharply from January through March. This is in contrast to historic mean stream flows, which tend to rise during the late winter and early spring. Flows in the Brandywine Creek at Chadds Ford, and the French Creek near Phoenixville are roughly 50% below the normal flow for March.

Currently, the water supply reservoirs within the County are full and there are no anticipated problems with the County's public water supply systems.

### **Criteria Used to Assess Drought Conditions**

Many drought management activities are coordinated at the county level, so PADEP's monitoring efforts are oriented primarily on a county basis as well.

The Commonwealth uses five parameters to assess drought conditions. These include streamflows (compared to the same time for the period of record); precipitation (departure from normal, 30 year average precipitation); reservoir storage levels in a variety of locations; groundwater elevations in a number of counties (comparing to past month, past year and historic record); and Palmer Drought Index, a measure of soil moisture computed by the National Weather Service.

### **Drought Phases**

Phases of drought preparedness in Pennsylvania are:

#### **Drought Watch**

A period to alert government agencies, public water suppliers, water users and the public regarding the onset of conditions indicating the potential for future drought-related problems. The focus during this stage is on increased monitoring, awareness and preparation for response if conditions worsen.

During a drought watch, a request is made for voluntary water conservation to reduce water uses by 5% in the affected areas. Because of varying conditions, individual water suppliers or municipalities are allowed to request more stringent conservation actions, with the coordination of the state.

#### **Drought Warning**

During a drought warning, preparations for a coordinated response to imminent drought conditions and potential water supply shortages are intensified. Also, requests for voluntary water conservation measures are made with the goal of reducing overall water uses by 15% in the affected areas.

#### **Drought Emergency**

The drought emergency stage is a concentrated management phase of operations to utilize all available resources to respond to actual emergency conditions, to avoid depletion of water sources, to assure at least minimum water supplies to protect public health and safety, to support essential and high priority water uses, and to avoid unnecessary economic dislocations.

It is possible during this phase to impose mandatory restrictions on nonessential water uses, if deemed necessary and if ordered by the governor of Pennsylvania.

#### **Local Water Rationing**

Although not a drought phase, local municipalities may, with the approval of the Commonwealth Drought Coordinator, implement local water rationing to share a rapidly dwindling or severely depleted water supply in designated water supply service areas.

## Conservation Tips

While everyone is always encouraged to take every opportunity to conserve water, the recent dry weather has raised the importance for residents and water users to make extra efforts at water conservation.

This is particularly important for people that rely on residential wells for their water supply. Ground water levels throughout the County declined sharply in March and are likely to continue to decline now that we are in the growing season.

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Leaks are the big water wasters in the home. Perform a water audit in your home.



Here is a simple way to check for leaks.

Read your meter TWICE. First at night after all water use has ended, and then again in the morning before your water use has begun. Subtract the first reading from the second reading to tell how much water (if any) leaked overnight. If you suspect a leak, check pipes, connections, faucets, toilets, etc. Have repairs made immediately.

Insulate hot water pipes to reduce the amount of water which must be run to get hot water to the faucet.

Take shorter showers and turn off the shower while soaping.

Turn off the water while brushing your teeth or shaving

Teach children to turn water faucets off tightly.

Run dish washers and clothes washing machines only when full.

Repair leaking faucets and toilets (a leaking toilet can waste 200 gallons a day).

Water saving plumbing fixtures and appliances are cost-effective, providing permanent long term economic advantages. Low flow toilets, showerheads and faucet aerators save valuable water and energy used to heat water without requiring a change in personal use habits.

Add your garbage to the trash instead of putting it down the garbage disposal.

Avoid using the toilet as a trash can for facial tissues, etc.

Disposals use a great deal of water and add unnecessary solids to the sewer or septic system.

Only water lawn and garden early in the morning.

Do not water lawn and garden on windy days.

Use soaker hoses and trickle irrigation systems to reduce the amount of water used for irrigation by 20 to 50 percent.

Use mulch around shrubs and garden plants to reduce evaporation from the soil surface and cut down on weed growth.

In landscaping, use native plants that require less care and water than ornamental varieties.

Wash cars with a pail of soapy water. Use a hose with a trigger nozzle to rinse. Wash cars on the grass. This will water the lawn at the same time.

Cover an outdoor pool when not in use. Clean the pool filter regularly.

Use a broom to sweep driveways and sidewalks rather than washing them down with a hose.

Install a rain barrel at one or more of your downspouts. These are available from gardening and arborist supply companies. New designs nearly eliminate the problems with odors and bugs, but put it away from the doors to your house to be sure. Rain barrels are made of recycled plastic and have valves to use to fill watering cans for watering your flower beds.



# Hydro Conditions

## Through March 31, 2006

With precipitation amounts of 4.4, 2.2 and 0.6 inches reported by the Middle Atlantic River Forecast Center for January, February and March 2006, respectively, Chester County had a deficit of 3.2 inches (or 30% below normal) for the first quarter of 2006 when compared to historic averages for each month. Over the last six months, the cumulative precipitation was 24.1 inches, although that includes precipitation of 9.8 inches in October 2005.

Stream flows dropped sharply from January through March. This is in contrast to historic mean stream flows which tend to rise during the late winter and early spring. The lower than average stream flows could result in a stressed water resource system in the late spring and early summer, depending on rainfall. The Chambers Lake reservoir remains above 100% capacity, as no water supply releases have been made yet this year.

Ground water conditions have also fallen sharply from February to March. Of the 18 observation wells with statistics, one well was below warning level in January while six wells were below warning in March, with one well below the drought emergency level. On average, there was a decrease of 0.84 feet in the ground water levels recorded from February to March 2006, compared to a historic median increase of 0.56 feet from February to March.

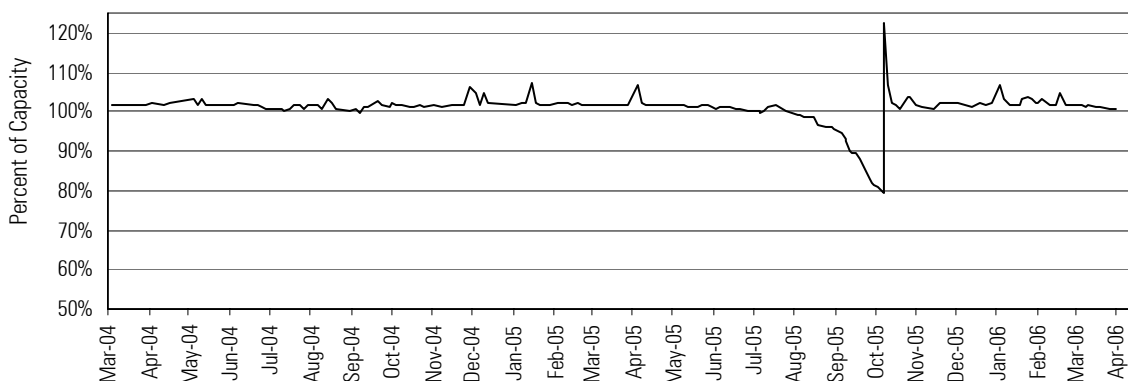
## Reservoirs

### Reservoir Water Levels and Storage Capacity as of March 31, 2006

	Normal Water Level	Water Level	Storage Volume (Millions of Gallons)	Percent Capacity
Chambers Lake Reservoir	580'	580.10'	386	101%
Marsh Creek Reservoir	359.5'	358.90'	4,400	98%

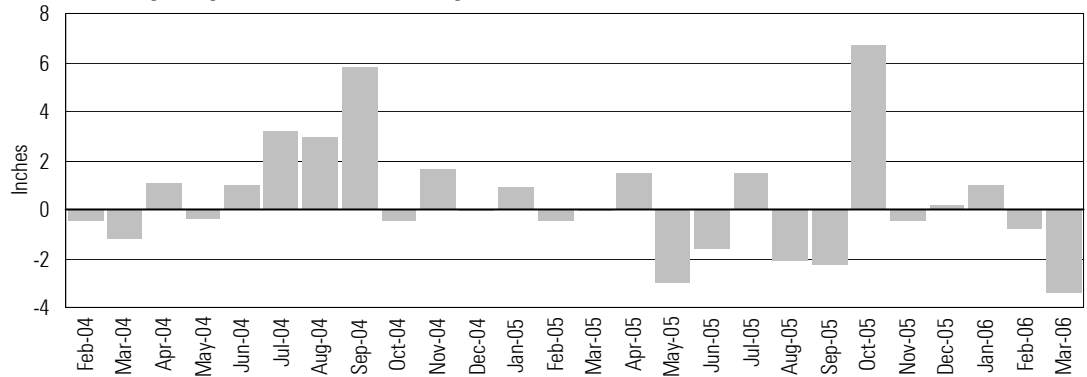
While Chambers Lake and Marsh Creek reservoirs are at full capacity, other water supply reservoirs have begun to see the impacts of precipitation deficits for the past 2 months.

### Chambers Lake Water Level, March 2004–March 2006



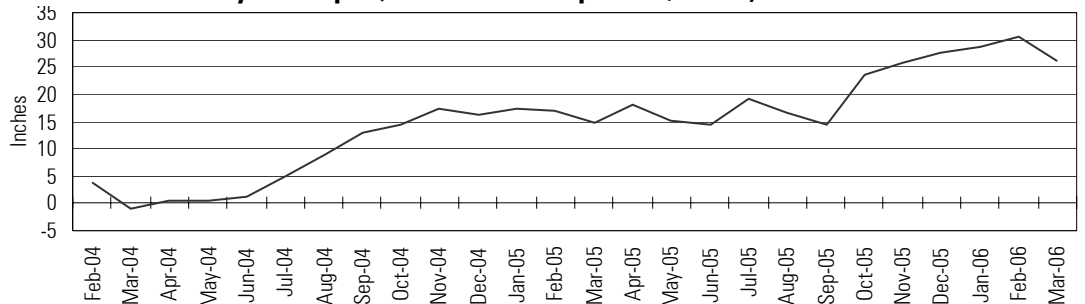
# Precipitation

**Monthly Surplus/Deficit for Precipitation, February 2004 – March 2006**



Precipitation deficits have occurred in seven of the past 12 months, resulting in a 12-month deficit of 2.8 inches.

**Cumulative 4-year Surplus/Deficit for Precipitation, February 2004 – March 2006**



**Chester County Precipitation in inches, 2005–2006**

	Middle Atlantic River Forecast Center (MARFC) <sup>1</sup>		Year-to-Date Cumulative		Chester County Observer Network <sup>2</sup>		NOAA 30-Year Normals <sup>3</sup>	
	Monthly		Rain	Surplus/Deficit	Mo. Rain	YTD Cum. Rain	Chester County Monthly Norm	Chester County YTD Cum. Rain
	Rain	Surplus/Deficit						
Mar 2005	3.9	-0.1	10.6	+0.3	4.40	11.36	3.99	10.85
Apr 2005	5.3	+1.5	15.9	+1.8	5.28	16.64	3.76	14.61
May 2005	1.2	-3.0	17.1	-1.2	1.69	18.33	4.45	19.07
Jun 2005	2.1	-1.6	19.2	-2.8	2.20	20.53	3.84	22.91
July 2005	6.2	+1.5	25.4	-1.3	6.52	27.05	4.39	27.30
Aug 2005	2.0	-2.1	27.4	-3.4	2.14	29.19	3.74	31.05
Sep 2005	1.6	-2.3	29.0	-5.7	1.62	30.81	4.56	35.60
Oct 2005	9.8	+6.7	38.8	+1.0	10.45	41.26	3.40	39.00
Nov 2005	3.3	-0.5	42.1	+0.5	3.51	44.77	3.72	42.71
Dec 2005	3.8	+0.2	45.9	+0.7	3.62	48.39	3.62	46.33
Jan 2006	4.4	+1.0	4.4	+1.0	4.64	4.64	3.88	3.88
Feb 2006	2.2	-0.8	6.6	+0.2	2.38	7.02	2.98	6.86
Mar 2006	0.6	-3.4	7.2	-3.2			3.99	10.85

**Long-term Precipitation Trends Through March 28, 2006**

Period	Surplus/Deficit
March 2006	- 3.4 in.
Year to Date	- 3.2 in.
6-mos. to Date	+ 3.2 in.
12-mos. to Date	-2.8 in.
24-mos. to Date	+ 12.1 in.
48-mos. to Date	+ 26.2 in.

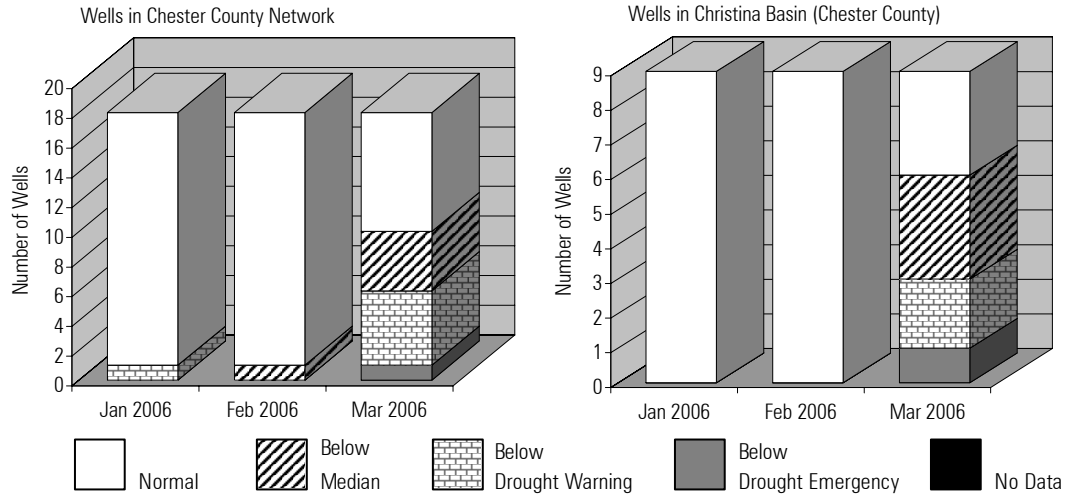
Sources:

- MARFC—Internet site: <http://www.erh.noaa.gov/er/marfc/>.
- Chester County Observer Network—Chester County Water Resources Authority Volunteer Rainfall Observer Network Monthly Reports.
- National Oceanic and Atmospheric Administration (NOAA), *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1971–2000*.

# Ground Water Levels

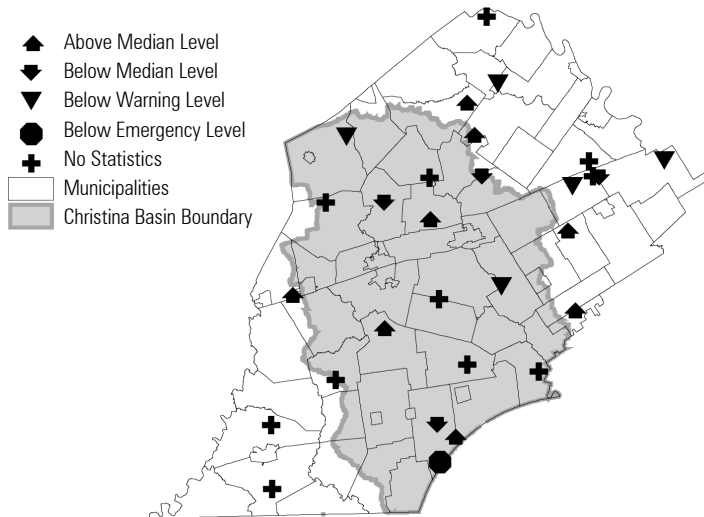
Well measurements in March 2006 indicated one well below the drought emergency level, five wells below drought warning and four other wells below median levels.

## Ground Water Conditions

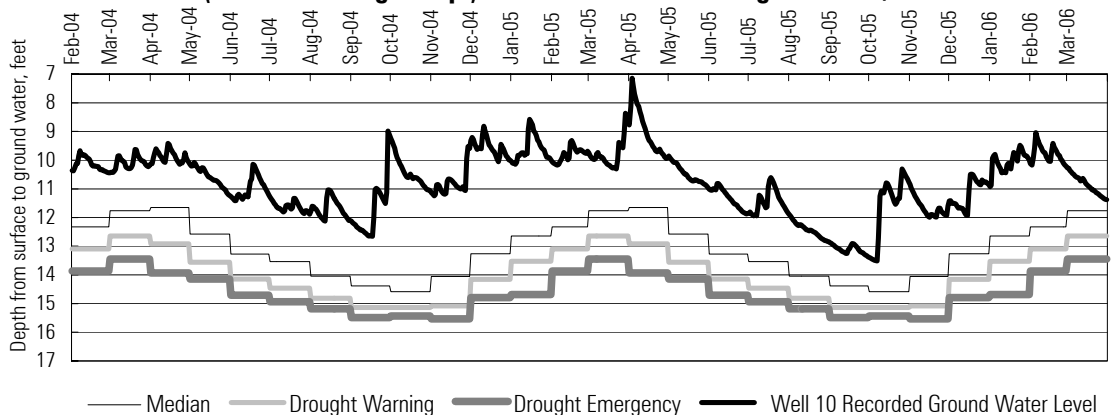


Chester County Observation Well Network. Water levels measured January 20, February 21, 2006 and March 20, 2006.

## Observation Wells Status—March 2006



## Well 10 (W. Marlborough Twp.) Water Levels and Drought Curves, Feb. 2004–Mar. 2006



As illustrated by the graph for Well 10, ground water levels have dropped sharply during the past three months, while statistical median levels indicate that ground water levels typically increase during this season.

# Stream Flows

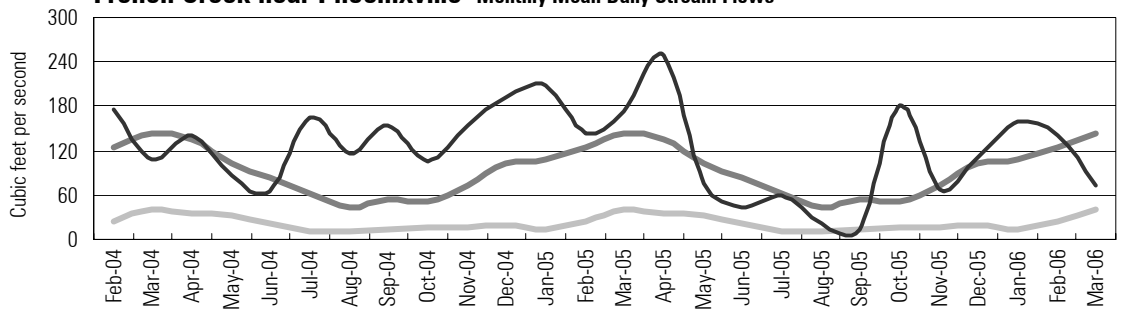
As indicated on the adjacent chart, the stream flows at the Brandywine Creek at Chadds Ford have dropped below the 90% exceedence level.

## Selected Stream Flows (cubic feet per second)

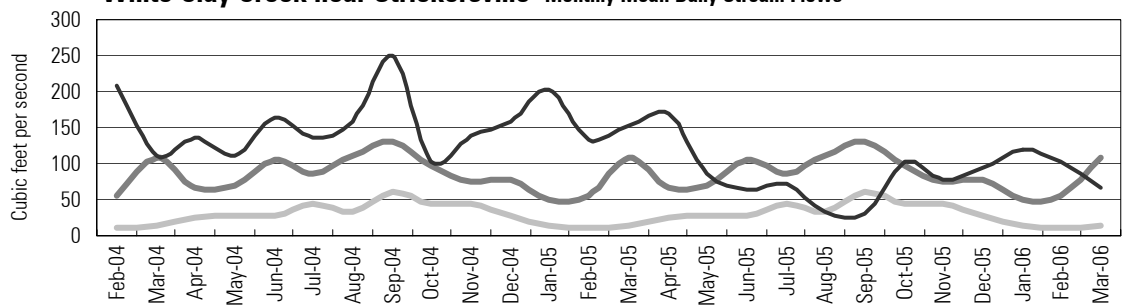
	Brandywine Creek at Chadds Ford				French Creek near Phoenixville	
	Mean Daily Flow (MDF)	Historic MDF Since 1974	PA-DEP 0.75 Exceeded	PA-DEP 0.90 Exceeded	Mean Daily Flow	Historic MDF Since 1974
Dec 2005	497	489	234	159	135	102
Jan 2006	716	533	313	192	174	107
Feb 2006	642	555	390	262	148	123
Mar 2006	355	669	458	386	73.5	144

Sources: Mean Daily Flow (MDF)—US Geological Survey's ADAPS Database (data are provisional). Historic MDF—US Geological Survey's *Water Resources Data Pennsylvania Water Year 2004, Vol. 1*.

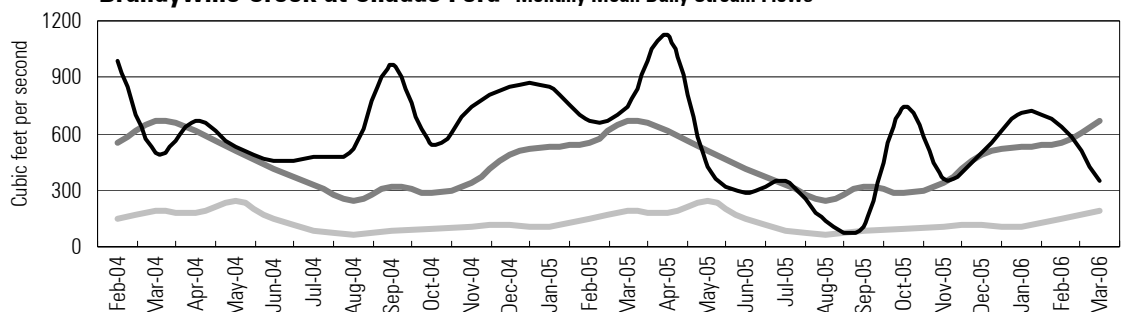
### French Creek near Phoenixville—Monthly Mean Daily Stream Flows



### White Clay Creek near Strickersville—Monthly Mean Daily Stream Flows



### Brandywine Creek at Chadds Ford—Monthly Mean Daily Stream Flows



— Historic Minimum Flow      — Historic Mean Flow      — Actual Mean Daily Flow

# Draft PA Stormwater Best Management Practices Manual

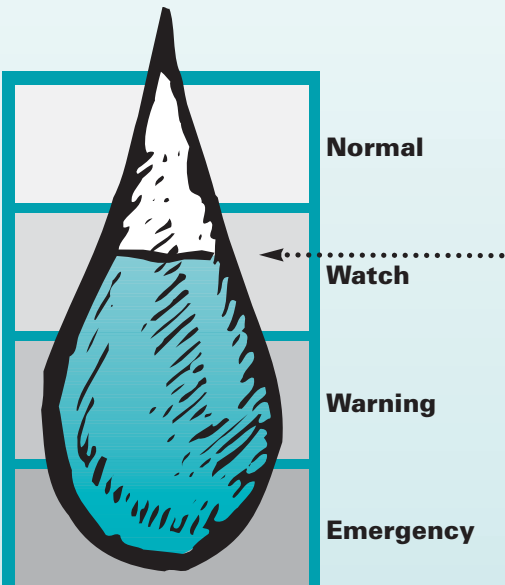
**60-day Public Review and Comment Period began April 15  
Comments must be submitted by June 14.**

PADEP has released the Draft PA Stormwater Best Management Practices (BMP) Manual for public review and comments. The draft manual is available on the PADEP website under the Stormwater Management webpage.

The BMP Manual is part of PADEP's Comprehensive Stormwater Management Policy. To assist with the implementation of this policy, PADEP is developing the BMP Manual and has announced the development of a new Model Stormwater Ordinance. The model stormwater ordinance is in development and will be available for public review in the future.

The Department will hold public meetings concerning the draft manual in Harrisburg on May 4, and Schnecksville (Allentown) on May 8.

Everyone interested in the water resources of PA and Chester County is encouraged to review the manual and provide comments to PADEP.

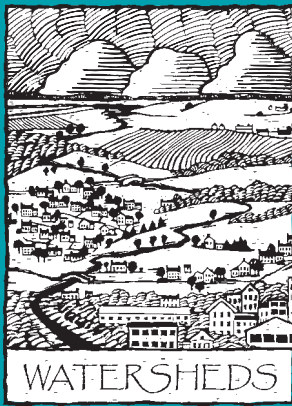


**Chester County**

**Hydrologic**

**Conditions**

**March 2006**



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**Chester County  
WaterWays**

*For more information regarding Chester County's watersheds and water resources, visit CCWRA's Web site at: [www.chesco.org/water](http://www.chesco.org/water).*