



April 4, 2013

John Ross  
Department of Public Works  
Worcester County  
1000 Shore Lane  
Ocean Pines, MD 21811

Re: Water Supply Capacity Management Plans (WSCMP) project  
Ocean Pines Water System (PSWID #0230005)

Dear Mr. Ross,

Whitman, Requardt, and Associates, LLP (WR&A) worked with MDE to update the Water Supply Capacity Management Plans (WSCMPs) for selected jurisdictions. WR&A was tasked with contacting local jurisdictions and owners of community water systems to obtain information on water system capacity and allocation, and used that data, along with system operating data provided by MDE to submit an updated WSCMP to MDE for each jurisdiction.

An assessment of the ability of the water system to meet existing and future water demands has been conducted and comments on that assessment should be sent to MDE. This letter serves as the Plan submittal for the system of Ocean Pines. The final WSCMP for the Town is attached. A brief narrative of the system's water system is included below:

#### Ocean Pines

The Ocean Pines Water System is served by water from five wells. Water is pumped from the wells then chlorinated, then stored in a 1,000,000 gallon tank.

The wells withdraw from the Columbia Aquifer. The system is permitted to withdraw an annual average flow of 1,500,000 gpd, and an average daily maximum month flow of 2,500,000 gpd. From 2007 to 2011 the water demand within Ocean Pines has averaged 1,203,800 gpd.

#### Largest Well Out Analysis

The capacity of the system's well field to meet current and future average annual demand is based on an estimate of groundwater production capacity when the largest well is out of service. Based on a 2011 report by Earth Data, Inc. (in the MDE files) Wells Nos. 2, 3, 4, and 5 each provide 500 gpm. Based on its well completion report, well No. 10 provides 500 gpm. Assuming one well is out of service, and assuming

pumping the other wells for 16 hours per day, the available pumping capacity with the largest well out of service is estimated at 1,920,000 gpd. Pumping information for the wells is as follows:

Water Appropriation Permit #	Tag #	Well #	Pumping Capacity	Average Flow (gpd) - 16 hours/day
WO1968G010 (07)	WO-69-0070	Well #2	500 gpm	480,000
WO1968G010 (07)	WO-69-0069	Well #3	500 gpm	480,000
WO1968G010 (07)	WO-69-0068	Well #4	500 gpm	480,000
WO1968G010 (07)	WO-73-0051	Well #5	500 gpm	480,000
WO1968G010 (07)	WO-94-2425	Well #10	500 gpm	480,000
<b>TOTAL</b>				<b>2,400,000</b>
<i>Largest well out of service</i>				<i>1,920,000</i>

### Drought Yield

The total drought yield can be computed assuming the wells operate for extended periods of time. During the month of maximum use it is assumed the pumps will operate at a maximum of 19 hours per day, producing a total flow rate of 2,850,000 gpd. Under peak day drought conditions, the pumps are assumed to run continuously to produce a flow rate of 3,600,000 gpd.

### System Capacity

In our professional opinion, calculations using the WSCMP worksheet indicated that the system has a current average day capacity excess of approximately 187,858 gpd based on the difference between average day drought demand and the total permitted annual average daily appropriations. Our analysis indicated an excess capacity at the current average daily-maximum month condition of approximately 510,000 gpd (where capacity is defined as the average daily maximum month capacity limitation minus the average daily maximum month drought demand), and a maximum day capacity excess of approximately 990,000 gpd. The analysis was based on data provided to WR&A by Worcester County and MDE, but not verified by WR&A.

WR&A was advised by the County that 1,695 EDUs of growth is allocated for the water system, which equates to 423,750 gpd of additional average day demand. Our analysis indicated that this exceeds the excess capacity and could ultimately cause a potential deficit of approximately 235,892 gpd. The future average daily capacity during the month of maximum use will have a potential deficit of 132,661 gpd. Inversely, the maximum day capacity will have an excess of approximately 40,800 gpd.

It should be noted that the system has an estimated loss of 225,000 gpd due to leaks, accounting for approximately 19% of the average annual flow. From discussion with County personnel, these leaks

301 South Caroline Street, Baltimore, Maryland 21231 www.wrallp.com Phone: 410.235.3450 Fax: 410.242.5715

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typically occur from individual water service lines and the County is in the process of repairing these leaks over time. Removal of these leaks will allow additional growth before causing a deficit under existing system conditions.

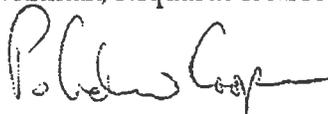
Wastewater flow from the Ocean Pines System is served by the Ocean Pines wastewater treatment plant (WWTP). The plant has a permitted capacity of 2.5 MGD and currently has an annual average flow of 1.5 MGD. Capacity appears to be available at the plant to serve projected development in the system.

The County has expressed interest in revising the water appropriation permit to match the wastewater treatment capacity

This analysis is based on best available records provided to WR&A by MDE and from information given to WR&A during interviews with County personnel. Any changes to the information contained in the Plan will require reinterpretation of the analysis. If you have any questions or would like additional information, please contact the MDE Water Supply program directly at 410-537-3706.

Very truly yours,

Whitman, Requardt & Associates, LLP



P. Andrew Cooper, F.E., BCEE  
Associate

Enclosures

cc: Neil Winner – MDE  
John Grace – MDE  
MDE System File  
Francis Bonkowski – WR&A  
Steve Mogilnicki – WR&A  
WR&A File – 13997

# WATER SUPPLY CAPACITY MANAGEMENT PLAN

## *Worksheets and Summary* Updated March, 2013

### SYSTEM AND PLAN SUBMITTAL INFORMATION

Name of the water supply system:	Ocean Pines
County and municipality, if applicable:	Worcester Co.
Population served:	* 11710
Number of connections:	9904
Name of person completing plan:	Francis Bonkowski
Date of plan submittal:	4/4/2013
	<i>* from 2010 census</i>

### IV. ELEMENTS OF A WATER SUPPLY CAPACITY MANAGEMENT PLAN

Please refer to the appropriate sections of the Guidance Document for Developing Water Supply Capacity Management Plans. Include any assumptions into this worksheet, as applicable.

**NOTE:** gpd = gallons per day; gpm = gallons per minute; gpcd = gallons per capita per day;  
gph = gallons per hour; gal = gallons; hrs = hours; PF = peaking factor

#### A. DETERMINE THE EXISTING WATER DEMAND

**A-1 Provide the Annual Average Daily Demand (AADD) for each of the previous 5 years.**

2011	1,260,000	gpd
2010	1,260,000	gpd
2009	1,120,000	gpd
2008	1,119,000	gpd
2007	1,260,000	gpd

**A-2 Determine the average demand for previous 5 years.**

1,203,800	gpd
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**A-3 Enter the percentage of residential use.**

90.00	%
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**A-4 Determine the Annual Average Daily Drought Demand.**

1,312,142	gpd
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**A-5 Provide the Average Daily Demand for the Month of Maximum Use (MMU) for each of the previous 5 years and determine the Peaking Factor for each year.**

<u>Month</u>	<u>Year</u>	<u>MMU</u>	<u>Peaking Factor</u>
July	2011	1,850,000	gpd
July	2010	1,990,000	gpd
July	2009	1,800,000	gpd
August	2008	1,850,000	gpd
July	2007	1,980,000	gpd
			1.47
			1.58
			1.61
			1.65
			1.57

A-6 Enter the greatest Average Daily Demand during the Month of Maximum Use from the previous five years.

1,990,000 gpd

A-7 Determine the Average Daily, Maximum Month Drought Demand.

1,990,000 gpd  
1.52 PF

A-8 List the greatest Maximum Day Demand observed within the previous five years and the date.

2,610,000 gpd  
Date: August 2010

\*Based on MDE MOR data

A-9 Determine the Maximum Day Demand.

2,610,000 gpd  
1.99 PF

A-10 List the Peak Hour Demand, if data is available.

gph

A-11 Determine the existing water usage per capita per day.

103 gpcd

A-12 Determine the existing Water Usage per connection.

122 gpd

A-13 List the percentage of Water Demand attributable to the following uses:

Residential;	90.00	%
Commercial; and	10.00	%
Industrial	0.00	%

A-14 If data is available, list the approximate amount of water lost due to each of the following:

System losses (leaks);	225,000	gpd
Transfers;		gpd
Meter errors; and		gpd
Other (specify below)		gpd

[Empty box for specifying other water loss categories]

A-15 Enter the percentage of customers that are metered.

100.00 %

**B. ESTIMATE THE POTENTIAL ADDITIONAL WATER DEMAND**

B-1 Determine the potential additional annual average daily residential water demand.

381,375 gpd

B-2 Determine the potential additional annual average daily commercial water demand.

42,375 gpd

B-3 Determine the potential additional annual average daily industrial water demand.

0 gpd

B-4 Determine the total potential additional annual average daily water demand. 423,750 gpd

B-5 Determine the total potential additional average daily water demand during the month of maximum use. 642,661 gpd  
1.52 PF

B-6 Calculate the potential additional maximum day demand. 949,200 gpd  
2.24 PF

B-7 Use the table below to record the system's anticipated allocation schedule for each of the next ten years.

2014	10,340	2019	10,340	gpd
2015	10,340	2020	10,340	gpd
2016	10,340	2021	10,340	gpd
2017	10,340	2022	10,340	gpd
2018	10,340	2023	10,340	gpd

\* 1,695 EDUs over 20 years at 122 gpd/EDU

**C. DETERMINE THE CAPACITY OF THE WATER SUPPLY SYSTEM**

C-1 List all Water Appropriation Permits, Water Purchase Agreements, permit/agreement limits, and indicate if there are Special Conditions that limit withdrawal quantities.

Permit Number or Purchase Agreement	Well Numbers or Source Names	Annual Average (gpd)	Ave. Day-Max Month or Max Day Amt. (gpd)	Special Conditions?
W01968G010	5 Wells in Columbia Aq.	1,500,000	2,500,000	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No
				<input type="checkbox"/> Yes <input type="checkbox"/> No



C-7 Enter the daily production capacity of highest producing well. 480,000 gpd  
Well Name: #2,3,4,5 or 10

C-8 Calculate the total system capacity with the largest well out of service. 1,920,000 gpd

Note: If removal of largest well increases the capacity of another well, adjust the capacity in C-8 accordingly. Explain below:

C-9 Determine the total reliable drought yield for the following conditions:

a.) During the Month of Maximum Use 2,850,000 gpd  
b.) During Peak Day conditions 3,600,000 gpd

C-10 Enter the safe-yield of the reservoir system, if one exists. [ ]

C-11 Enter the total treatment capacity of the water plant(s). [ ] gpd

C-12 Enter the pump capacity of the water plant. [ ] gpd

C-13 Enter the total system storage capacity. 1,000,000 gal

C-14 Enter the maximum fire flow and duration. 1,000 gpm  
2 hrs

C-15 Enter the storage for fire flow. 750,000 gal

C-16 Explain how the fire flow and storage values were determined. In what year were these values most recently evaluated?

The water and Wastewater Division maintains a hydraulic model of the system in EPAnet. The last use of the model was in 2010 to determine the available fire flow to Showell Elementary School.

C-17 Discuss the frequency of power outages.

Power outages are rare, normally caused by weather events.

C-18 Is there a back-up power source for treatment and pumping?  Yes  No  
If yes, please describe.

All wells and well houses have emergency power generators.

C-19 Enter the average day capacity for the wastewater treatment system in the service area. Is additional capacity available at the plant? Explain below.

**2,500,000** gpd

The current flows average less than 1.5 MGD leaving approximately 1.0 MGD of excess sewer capacity.

C-20 Are there anticipated future modifications to the appropriation permits?  Yes  No  
If yes, explain below.

**D. ESTIMATE THE EXCESS WATER SUPPLY CAPACITY BY DETERMINING THE MOST LIMITING FACTOR**

**PART I. ESTIMATE THE EXCESS WATER SUPPLY CAPACITY ABOVE EXISTING DEMAND**

**Average Day Capacity Limitation**

- C-3 Total permitted annual average daily permit limits **1,500,000** gpd
- C-8 Total system capacity with largest well out of service **1,920,000** gpd
- C-10 Safe-yield of the reservoir system **N/A** gpd
- C-11 Treatment capacity **N/A** gpd
- C-12 Pump capacity of treatment plant **N/A** gpd
- D-1 **Average Day Capacity Limitation** **1,500,000** gpd

**Excess Average Day Capacity**

- D-1 Average Day Capacity Limitation **1,500,000** gpd
- A-4 Annual Average Daily Drought Demand **1,312,142** gpd
- D-2 **Excess Average Day Capacity** **187,858** gpd

**Average Daily - Maximum Month Capacity Limitation**

- C-2(b) Total permitted Average Daily-Maximum Month Appropriations **2,500,000** gpd
- C-9(a) Reliable drought yield during Month of Maximum Use **2,850,000** gpd
- C-11 Treatment Capacity **N/A** gpd
- C-12 Pump capacity of treatment plant **N/A** gpd
- D-3 **Average Daily-Maximum Month Capacity Limitation** **2,500,000** gpd

**Excess Average Daily - Maximum Month Capacity**

D-3	Average Daily-Maximum Month Capacity limitation	2,500,000	gpd
A-7	Average Daily-Maximum Month Drought Demand	1,990,000	gpd
D-4	Excess Average Daily-Maximum Month Capacity	510,000	gpd

**Maximum Day Capacity Limitation**

C-2(d)	Total permitted Maximum Day Permit Limits	N/A	gpd
C-9(b)	Peak Day Drought Capacity	3,600,000	gpd
C-11	Treatment Capacity	N/A	gpd
C-12	Pump Capacity of treatment plant	N/A	gpd
D-5	Maximum Day Capacity Limitation	3,600,000	gpd

**Excess Maximum Day Capacity**

D-5	Maximum Day Capacity Limitation	3,600,000	gpd
A-9	Maximum Day Demand	2,610,000	gpd
D-6	Excess Maximum Day Capacity	990,000	gpd

**SUMMARY OF EXCESS EXISTING CAPACITY**

D-2	Excess Average Day Capacity	187,858	gpd
D-4	Excess Average Daily-Maximum Month Capacity	510,000	gpd
D-6	Excess Maximum Day Capacity	990,000	gpd

**D. PART II. ESTIMATE THE EXCESS WATER SUPPLY CAPACITY AVAILABLE FOR  
FUTURE ALLOCATION**

The three net excess values calculated below indicate the **approximate excess capacity (gpd)** available for new growth. If an excess capacity value is a negative number, there is a capacity deficit for that demand category.

**NAME OF THE WATER SUPPLY SYSTEM:** Ocean Pines

**COUNTY AND MUNICIPALITY, IF APPLICABLE:** Worcester County

**SUMMARY OF POTENTIAL ADDITIONAL DEMAND FROM APPROVED**

B-4	Potential Additional Annual Avg. Daily Demand	423,750	gpd
B-5	Potential Additional Avg. Daily-Max. Month Demand	642,661	gpd
B-6	Potential Additional Maximum Day Demand	949,200	gpd

**ANNUAL AVERAGE DAILY CAPACITY**

D-2	Excess Average Day Capacity	187,858	gpd
B-4	Potential Annual Avg. Daily Demand	423,750	gpd
D-7	<b>NET EXCESS</b>	<b>-235,892</b>	<b>gpd</b>

**AVERAGE DAILY CAPACITY DURING THE MAX. MONTH**

D-4	Excess Avg. Daily-Max. Month Capacity	510,000	gpd
B-5	Potential Avg. Daily Demand During Max. Month	642,661	gpd
D-8	<b>NET EXCESS</b>	<b>-132,661</b>	<b>gpd</b>

**MAXIMUM DAY CAPACITY**

D-6	Excess Maximum Day Capacity	990,000	
B-6	Potential Maximum Day Demand	949,200	
D-9	<b>NET EXCESS</b>	<b>40,800</b>	<b>gpd</b>

**SUMMARY OF EXCESS ADDITIONAL CAPACITY**

D-7	Excess annual average daily capacity	-235,892	gpd
D-8	Excess average daily capacity during max. month	-132,661	gpd
D-9	Excess maximum day capacity	40,800	gpd

**E. CONTROL THE ALLOCATION OF NEW CONNECTIONS TO THE WATER SUPPLY SYSTEM**

- 1.) Describe your jurisdiction's Adequate Public Facilities Ordinance (APFO) or comparable statute. Attach a copy of the APFO regulations or comparable regulations.  
**The County has no AFPO.**
  
- 2.) Describe your jurisdiction's allocation procedures. Attach a copy of the procedures.  
**Water capacity is allocated during the subdivision review process. Each proposed subdivision is required to provide evidence of adequate water and wastewater facilities.**
  
- 3.) How frequently are periodic allocation tracking reports produced?  
**Allocates are only tracked when changes are made.**
  
- 4.) To whom are these reports distributed?
  
- 5.) During the plat approval process, which agency (or official) ensures that the water supply system has adequate capacity to serve the proposed development?  
**The Environmental Programs Department reviews plats for water supply adequacy with technical review by the Department of Public Works.**
  
- 6.) During the building permit approval process, which agency (or official) ensures that the water supply system has adequate capacity to serve the proposed development?  
**Building permit applications are signed by the Department of Environmental Programs.**
  
- 7.) Which agency (or official) controls the allocation of connections to the water supply system?  
**The Directory of Environmental Programs.**

NAME OF THE WATER SUPPLY SYSTEM: Ocean Pines

COUNTY AND MUNICIPALITY, IF APPLICABLE: Worcester County

**CONTACT INFORMATION:**

List the name, title, address, phone number, fax number, and email address of the elected official or water supply system owner completing this Capacity Management Plan.

Name: John Ross

Title: Deputy Director of Public Works

Address: 1000 Shore Lane

Ocean Pines, MD 21811

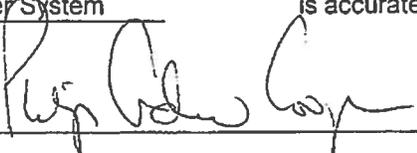
Telephone: (410) 641-5251 X-112

Fax: (410) 641-5185

Email: [jross@co.worcester.md.us](mailto:jross@co.worcester.md.us)

**CERTIFICATION:**

I, Philip Andrew Cooper hereby certify that it is my professional opinion that to the best of my knowledge, information, and belief based on unverified data supplied by the Owner of the water supply system and MDE, that the attached Water Supply Capacity Management Plan for the Ocean Pines Water System is accurate and complete.

Signature: 

Date: 5 APRIL, 2013

Printed Name: PHILIP ANDREW COOPER

