Ohio EPA’s Planning and Design Criteria for Establishing Approved Capacity for: 1) Surface Water And Ground Water Supply Sources, 2) Drinking Water Treatment Plants (WTPs), and 3) Source/WTP Systems (commonly referred to as the approved capacity document) was adopted as a guideline for the technical review of detail plans for public water systems in Ohio Administrative Code rule 3745-91-08, effective May 20, 2010. The following information should help answer some of the frequently asked questions regarding this document. The approved capacity document is available online at [http://www.epa.ohio.gov/portals/28/documents/engineering/ApprovedCapacity.pdf](http://www.epa.ohio.gov/portals/28/documents/engineering/ApprovedCapacity.pdf).

**General/Implementation**

Q1: Does the approved capacity document apply to my public water system?
A1: The approved capacity document applies to all public water systems, except small public water systems using only ground water (such as factories, mobile home parks, office buildings, restaurants and condominiums) which are designed in accordance with the Guidelines for Design of Small Public Water Systems (the Greenbook).

Q2: Does the approved capacity document apply to plans submitted prior to the effective date of the rule (5/20/10)?
A2: No. Only detail plans submitted after the effective date of the rule revisions (5/20/10) requesting a change in the approved capacity of a water-supply source, water treatment plant (WTP) or source/WTP system will be evaluated using the criteria in the new approved capacity document, and must include:

- basis-of-design tables for both the water-supply source and WTP, including the equivalent maximum day capacity which determines the limiting component; and
- finished-water production projections (which, compared with the source/WTP-approved capacity help determine when an expansion or other actions are necessary).

Q3: When plans are submitted requesting a change in water-supply source approved capacity, will Ohio EPA also review the WTP approved capacity?
A3: Yes. Any set of plans requesting a change in water-supply source approved capacity would trigger a review of the WTP approved capacity. The approved capacity of the WTP may not change, but it is important to evaluate it. For example, if the water-supply source approved capacity increases, the WTP approved capacity may now be limiting for the source/WTP system approved capacity.

Q4: When approving a new well, will Ohio EPA establish a new water-supply source approved capacity?
A4: It depends whether the water system requests a change in approved capacity.

Case 1: The water system submits plans for a new well, but does not request an increase in the water-supply source approved capacity. The system may want the new well for some reason other than source water supply capacity (operational flexibility, redundancy, etc.) In this case, Ohio EPA does not review the water-supply source approved capacity and re-states the existing water-supply source approved capacity in
the plan approval letter. Ohio EPA will recommend the water system begin evaluating their water-supply source capacity.

Case 2: The water system submits plans for a new well and requests an increase in the water-supply source approved capacity. In this case, Ohio EPA reviews both the water-supply source approved capacity and the WTP approved capacity.

Q5: If a water system is expanding the approved capacity of the WTP, do they have to send in basis-of-design tables for both the water-supply source and WTP?

A5: Yes. If both are not received, Ohio EPA will include it as a requirement in the plan approval comment letter.

Q6: When a water system submits plans for a new process (for example, polymer addition), but does not request a change in the approved capacity of the WTP or the source/WTP system, do they have to submit basis of design tables?

A6: A basis of design table will be needed for the new process to ensure it meets the design standards of the approved capacity document and is adequately sized for the current WTP approved capacity.

Q7: Does Ohio EPA determine whether production exceeds approved capacity based on instantaneous loading rates or average production over the water system’s actual operating period?

A7: Ohio EPA does not look at instantaneous loading rates or instantaneous capacities. Rather, Ohio EPA evaluates whether the average production exceeds the source/WTP approved capacity, prorated for the actual hours of operation, as follows:

\[
\text{Average production} = \frac{\text{Total water produced during operating period}}{\text{Hours of operation}}
\]

Even though Ohio EPA does not evaluate capacity on an instantaneous basis, high loading rates may have an impact on a water system’s ability to meet other water quality and treatment technique requirements.

Q8: Can component capacities be exceeded?

A8: A component capacity can be exceeded temporarily, but if a component capacity exceeds the source/WTP approved capacity, prorated for their actual hours of operation, the system would receive a plan approval violation. Also, the water system is still required to meet all other water quality and treatment technique standards.

Q9: If the water-supply source approved capacity is less than WTP approved capacity, can the system operate their WTP at the WTP approved capacity? For example, if the system has an 8 MGD water-supply source approved capacity and a 10 MGD WTP approved capacity, can the system operate the WTP at 10 MGD?

A9: The approved capacity document indicates the system will receive a plan approval violation if any component (except clearwells and most pumps) is operated at an average rate over a 24-hour period that exceeds the source/WTP system’s approved capacity. If the system can document a good reason why the source/WTP system needs to operate at/near its approved capacity (for example, water main break or fire), then on a case-by-case basis, Ohio EPA may determine not to issue a violation. Otherwise, if the system is operating that close to its
source/WTP system approved capacity, they should start planning and Ohio EPA will issue the violation.

Q10: Are component capacities required to be included in the basis of design table based on an operating period of 24 hours?
A10: Yes.

Q11: If the plan approval stipulates the source/WTP system approved capacity is based on 24 hours, do they actually have to operate 24 hours?
A11: No, but the water system would have to prorate their production during the actual period of operation.

Q12: Is it a problem if a water system with redundant treatment exceeds their approved capacity because of emergencies, etc.?
A12: Ohio EPA would consider this a violation of plan approval and will issue a violation letter. However, violations of plan approval do not require public notification or inclusion in the consumer confidence report. Ohio EPA will discuss any plan approval violations during the sanitary survey and evaluate the underlying causes for the exceedances. If such violations are occurring during non-emergency situations, it may be an indication the water system needs to address a capacity issue.

Q13: How will Ohio EPA determine if approved capacity is exceeded?
A13: Ohio EPA will compare the production reported on the monthly operating reports (MOR) with the source/WTP approved capacity. Water systems that operate less than 24 hours per day should also include their hours of operation for each day in the comment field on the MOR. If an exceedance is noted, Ohio EPA will need to conduct further review as to which component is limiting and whether a plan approval violation should be issued.

Q14: Does changing the ratio of maximum-day to average-day allow a wellfield to have a higher maximum-day?
A14: No. The equivalent maximum-day for the wellfield is higher, which is just a way to determine which component is limiting in determining the approved capacity of the source/WTP system. To increase the approved capacity of the source/WTP system, the public water system must increase the limiting component of the water-supply source or the WTP.

Q15: Is production based on the finished water meter?
A15: Yes, assuming the meter is installed downstream of the finished water pumps. In the approved capacity document “production” is defined as the rate at which finished water exits the WTP (enters the distribution system) to satisfy customer water demands (e.g. domestic (residential), commercial, public, fire flow, and industrial), and also reflects the effects of accounted for and unaccounted for water losses and inaccurate meters.

Q16: Are the requirements for generators and alternative water providers unchanged?
A16: The approved capacity document does not address generators or alternative water providers, so a water system would have to meet the requirements of the Recommended Standards for Water Works (Ten State Standards).
Q17: What does “utilize blending” mean? Does it mean blending wells/sources, or blending treatment?
A17: Both. A water system can blend treated water with bought water, ground water with surface water, or treated and untreated water (for example, blending GAC treated water and water that has bypassed GAC treatment for DBPs).

Water-supply source approved capacity

Q18: How are off-stream reservoirs which gravity feed raw water to the WTP addressed in determining the water-supply source approved capacity?
A18: The system would need to determine the equivalent maximum-day capacity for the off-stream reservoir and include the information on the basis of design table used to determine the water-supply source approved capacity. This will likely need to be supported by an engineering submission.

Q19: The component capacity of wells/pumps are generally determined individually. When more than one well/pump is in use, it may be hydraulically limited. Does Ohio EPA need to see a hydraulic analysis in this case?
A19: The design engineer should look at the total dynamic head when sizing and rating the pumps, so this issue should be addressed in a properly sized pump component capacity. The same issue occurs in the plant, and it is something Ohio EPA typically expects the design engineer to address without further review by Ohio EPA. For wells, it is well known that in some instances, wells in the same well field will show mutual interferences which could result in a lower total capacity than the sum of the individual well capacities. Ohio EPA has convened a workgroup tasked with developing guidance to address this issue.

Q20: Does Ohio EPA have authority to regulate safe yield of the aquifer?
A20: Ohio EPA’s Division of Drinking and Ground Waters (DDAGW) does not have the authority to get into water rights issues or interferences between wellfields, which is the jurisdiction of the Ohio Department of Natural Resources (ODNR). DDAGW can look at the impact and interferences between multiple wells within a wellfield (and whether the aquifer may be limiting when multiple wells are pumping simultaneously). Ohio EPA has convened a workgroup tasked with developing guidance to address this issue.

Q21: If a water system utilizes water directly from a well(s) to backwash filters, should the water needed to backwash the filters be included in the water-supply source approved capacity for the well(s)?
A21: Yes. While not specifically addressed in the approved capacity document, the amount of water required to backwash the filter(s) must be included in the water-supply source for the well(s).

Q22: Does “off-line” storage mean a reservoir for ground water sources?
A22: Yes.

Q23: Can a water system operate all their wells at the same time?
A23: No. Wells are rated with one out of service. If operating them all simultaneously is necessary to meet their regular demands, then the water system likely needs to address the shortfall and increase their water-supply source approved capacity.
Water treatment plant (WTP) approved capacity

Q24: Ohio EPA didn’t previously require 30 days storage for any chemical. Is 30 days storage for essential chemicals now required?
A24: The Recommended Standards for Water Works (Ten State Standards) Section 5.1.9 requires at least 30 days storage for all chemicals. Ohio EPA requires at least 30 days storage for essential chemicals as defined in the approved capacity document.

Q25: If a water system originally used potassium permanganate for zebra mussel control, but it is now important for disinfection byproducts (DBPs) control, is it considered an essential chemical?
A25: If the water system would exceed the DBP MCL without it, then yes, it would be considered an essential chemical. The approved capacity document defines an oxidant where required for removal of primary contaminants to be an essential chemical.

Q26: Are filter aids considered essential chemicals?
A26: Yes, if the filter aids are necessary to meet enhanced surface water treatment turbidity standards or any other requirement.

Q27: For ground water iron and manganese treatment, redundancy is not required for filters. Is redundancy required for chemical feed equipment?
A27: Redundant chemical feed equipment is not required for treatment to remove iron/manganese or for other aesthetic issues. If the system is treating to remove arsenic, redundancy would apply. The approved capacity document requires chemical feed equipment redundancy only when treating for an MCL, treatment technique or lead/copper.

Q28: When is redundant treatment required? For example, is redundancy needed for in-line mixers?
A28: The approved capacity document requires redundancy when treating for an MCL, treatment technique or lead/copper. Redundancy is required if the in-line mixers perform the function of rapid mixers for surface water treatment or are part of a treatment process necessary to meet a required treatment technique or water quality standard.

Q29: What will Ohio EPA do if a water system wants to install corrosion control and keep their existing WTP approved capacity?
A29: Ohio EPA will re-state the existing WTP approved capacity in the plan approval letter.

Q30: Will Ohio EPA review plans for a new WTP component that would be an upgrade, not an expansion, using the criteria in the approved capacity document (for example, UV)?
A30: Yes, Ohio EPA will use the design criteria for the new component as listed in the approved capacity document. However, Ohio EPA will not re-evaluate the component capacities for the rest of the plant. In this case, Ohio EPA will re-state the existing WTP approved capacity in the plan approval letter.

Q31: How are residual streams (for example, backwash water) taken into account in the approved capacity document?
A31: When the residual stream(s) generated during treatment exceed(s) five percent of the desired approved capacity of the WTP, the component capacity is not calculated directly based on the projected design-year average-day or maximum-day production. A discussion of residual
streams and examples showing how to account for them are available on pages 15-18 of the approved capacity document.

Q32: How do peak-hour production and peak-hour of treatment affect each other?
A32: In water systems with a clearwell, the two are separate and not necessarily related. In water systems without a clearwell (such as some ground water systems that are pressurized and the well pumps pump water through the treatment and straight out to the distribution system), then the two are identical.

Q33: How is gravity accounted for in peak-hour production?
A33: Peak hour production is water leaving the WTP, regardless if by gravity or pumped.

Q34: Will Ohio EPA review detention times for softening?
A34: No. As noted in the answer to Q7, Ohio EPA will not be looking at loading rates or instantaneous capacities, but instead will review whether production exceeds the approved capacity, prorated for their actual hours of operation.

Q35: If a WTP is approved with four filters and takes two offline, can the WTP be operated at its approved capacity?
A35: No. Filters are approved with one out of service, so it would be a violation of plan approval if the WTP is operated at its approved capacity with more than one filter out of service.

Q36: Follow up to Q35: Can production be prorated for the amount of filters in service, and the WTP be operated at an equivalently lower rate? For example, can a WTP approved with 4 filters operate with only 2 filters in service at 50% of the WTP approved capacity?
A36: Yes, as long as the average loading rate for the filters in operation does not exceed the loading rate that was used to arrive at the component capacity for filtration during the period of operation. This principle applies to all other components (note: for clearwells, CT requirements must continue to be met).

Q37: Will Ohio EPA allow a water system to bypass treatment for iron and manganese removal?
A37: The approved capacity document doesn’t cover bypasses. However, Ohio EPA will continue to allow bypass around iron and manganese removal as we have in the past (for example, where necessary to service units such as Aerolators and Dualators).

Q38: Why are pumps considered a possible limiting component, if operating them above the source/WTP approved capacity does not cause a violation of plan approval?
A38: Pumps are rated with one out of service to ensure redundancy, but Ohio EPA does not wish to penalize a water system for using all their pumps at the same time. However, operating the pumps in excess of the approved capacity could result in a violation of plan approval by a component upstream or downstream of the pumps.

Performing projections/planning requirements

Q39: Which public waters systems must complete production projections and planning?
A39: The production projections/planning requirements in the approved capacity document only apply to public water systems serving political subdivisions as defined in Ohio Revised Code Section 6119.011(B) or regulated by the Public Utilities Commission of Ohio (PUCO).
Q40: Will Ohio EPA develop guidelines for completing production projections?
A40: Ohio EPA is considering developing a worksheet in the future to help guide the process, but there are many different acceptable ways to develop the projections and plan accordingly.

Q41: When are water systems required to complete production projections, and when is it recommended?
A41: Production projections are required when a system submits plans requesting a change in water-supply source, WTP or source/WTP approved capacity. If production projections are not included with plans received requesting a change in approved capacity, Ohio EPA will include it as a requirement in the plan approval comment letter. Otherwise, completing production projections is recommended every five years. (Note: In the future, Ohio EPA intends to adopt a requirement to complete projections every five years.)

Q42: How many maximum-day exceedances is a water system allowed before they have to start planning?
A42: Ohio EPA is moving away from allowing a certain number of maximum-day exceedances before a water system must begin planning. If the water system’s current production is already in exceedance of their source/WTP approved capacity, Ohio EPA will issue a plan approval violation and the water system will be required to remedy the situation. If the water system’s production projections indicate they will exceed their source/WTP approved capacity within five years, they should start designing to address the shortfall. If they will exceed within five to ten years, they should start planning.

Q43: Do water systems have to do future planning, or can they just use the last couple years of maximum-days?
A43: The approved capacity document requires water systems to submit production projections with detail plans when requesting a change in the source/WTP system approved capacity. These projections should include five years historical data and projections five and ten years into the future. Ohio EPA believes it will be relatively straightforward for even small water systems to complete these projections.

For more information, contact your Ohio EPA district office representative or Ohio EPA's Central Office at (614) 644-2752.