# Division of Drinking and Ground Waters

## Response to Comments
## August 13, 2009

**Draft plan approval rule amendments**
OAC 3745-91-02, Application for approval of plans
OAC 3745-91-03, Requirements for plan drawings
OAC 3745-91-08, Procedure for approval; changes

**Agency Contact for this Package**

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Ohio EPA issued public notice and requested interested party comments on draft amendments to the plan approval rules in Chapter 3745-91 of the Ohio Administrative Code (OAC) for the period of January 26, 2009 to February 20, 2009. This document summarizes the comments and questions received during the interested party public comment period.

Ohio EPA reviewed and considered all comments received during the interested party comment period. By law, Ohio EPA has authority to consider specific issues related to protection of the environment and public health.

In an effort to help you review this document, the questions are grouped by topic and organized in a consistent format.

## Introduction

Ohio EPA Division of Drinking and Ground Waters drafted amendments to three plan approval rules, which establish requirements for plan drawings and procedures for plan approval or modification. The revisions also include an update to the rule by reference to the 2007 version of the "Recommended Standards for Water Works," and the addition of three new ones:

- "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,
- "Guidelines for Design of Small Public Water Systems" and
- "Guidelines for Arsenic Removal Treatment for Small Public Drinking Water Systems."

**OAC 3745-91-03, Requirements for plan drawings**

Comment 1: Two comments were received regarding the requirement for a professional engineer to prepare plans for projects that involve the expenditure of public funds in excess of $5000. One commenter thought that this was overly conservative. The other commenter suggested that the provision be expanded to include both public and private funds, and to clarify what constitutes expenditure (e.g., construction dollars, design fees, total project costs, etc). (Robert Ettinger; Brian Coghlan, Bird+Bull, Inc.)

Response 1: This requirement has been in place for many years. Ohio EPA went through an extensive review of agency-wide professional engineering requirements several years ago, and this provision was maintained. DDAGW feels it is an appropriate cut-off to determine if the involvement of a professional engineer is required.

**OAC 3745-91-08, Rule by reference to "Guidelines for Design of Small Public Water Systems" (aka Greenbook)**

Comment 2: Several companies have eliminated pressure tanks and put inverters in their place. That's because pressure tanks go on and off frequently hurting both motors and pumps. Inverters are a better choice, but are not included in your drawings. (Robert Ettinger)

Response 2: This has not been an issue in the past as Ohio EPA has not approved plans for a small system without a pressure tank. If someone wanted to propose that type of system they would need to provide documentation on how it would work.

Comment 3: In reference to hydropneumatic systems; small systems, constant temperature of water input. Chlorine CT of 30 minutes is unreasonable, 1.5log[94%] of water used as measured in reference to peak usage or 60% as to capacity of pump needs 30 minutes. 2log[99%] requires 20min and 100% 15min. Chlorine is a biological process that is temperature dependent and we note that originating water never goes below 56 degrees compared to larger systems that water temperature, because of distant pumping can approach freezing temperature. This 12 degree centigrade difference is more than enough to compensate for reduced time with these systems. This provision would also tend to reduce the arbitrary over sizing of pumps which challenges

energy efficiency. CT may be reduced by 40% if preceded by 'standard' resin softener with minimum level of media at bottom of 0.33-40mm and CU of 1.65 at a depth of 15cm. No deduction can be used if mixing is used to lessen softening that may be required for Pb control. It should be noted that past history only required a mixing tank for chemical stability of free chlorine to give the 0.2ppm needed for distribution system. There is much confusion as to labeling and function of this common design. Sizing was usually 1.5 times pump cycle and depending on pump manufacturing specs. of as low as 1 minute per cycle and stability of water, would only give 1.5 minutes of CT. (Joel Helms)

Response 3: This is outside the scope of the current rulemaking. However, requirements related to CT may be addressed as part of upcoming rule revisions to adopt the federal Ground Water Rule.

Comment 4: 4.5D3 Less than 10kg equivalent of salt discharged per hector per day shall not require a NPDES. NPDES requirement would cause most to discontinue. This would result in more surfactants and greater DS in sewer effluent. (Joel Helms)

Response 4: Waste disposal is only included in this document for ease of reference. Any questions or comments on NPDES permitting requirements should be directed to the Division of Surface Water.

**OAC 3745-91-08, Rule by reference to "Guidelines for Arsenic Removal Treatment for Small Public Drinking Water Systems."**

Comment 5: Arsenic policy fails to notify that by Federal policy, no average consumer should pay more than 2.5% of their income for water. The language of policy yields purpose of design to reduce cost but does not mention absolute value. (Joel Helms)

Response 5: USEPA promulgated the MCL considering cost of compliance. Actual costs of installing and operating arsenic removal treatment may be greater per capita for nontransient or small CWS.

Comment 6: 5.2.2.1 & 6.2.2.1 requiring all treated water to be discharged during test is unrealistic as to cost. If a hazardous leachate of material could be anticipated, a simple test to that

direction should suffice. This requirement is more situated to a new source that does not yet have need, but for an existing source, puts twice the burden on other factors. Even if proposed system does not remove sufficient arsenic, at least some reduction will be realized to benefit consumers. Any peaking will be temporary and overall still a reduction on total consumed. (Joel Helms)

Response 6: Ohio EPA requires piloting for non-conventional treatment technologies. Non-conventional means the technology is new or does not have a proven case history demonstrating success in Ohio for drinking water treatment. Ohio EPA cannot approve plans for a system that utilizes technology that is considered "non-conventional" without an acceptable pilot study demonstrating reliable and consistent treatment. Ohio EPA cannot allow a PWS to install a treatment unit and send water processed through the treatment unit to distribution without first issuing a plan approval (Ohio Administrative Code 3745-92). Therefore, piloting must include the provision to send the piloted treatment effluent to waste so as not to violate plan approval requirements. Only water treated through the piloted units must be sent to waste.

In practice, smaller, pilot-scale units have been utilized to simulate full-scale operations which require less flow and less water-to-waste for the pilot study. A side-stream of flow is sent to the pilot unit(s) and wasted, while the remainder of the flow from the well is pumped to the distribution system to meet demands. In practice, some piloted treatments have failed. By conducting a pilot prior to purchasing and installing treatment units, the PWS has assurance that a particular treatment approach is right for their situation and they can fine tune their treatment approach during the pilot while gaining experience in operating the new treatment units. From a regulatory standpoint, a trial and error approach is better done with a pilot unit, than with a full-scale installation, which is a bigger investment- in time, money and risk of continued non-compliance with arsenic MCL and enforcement action.

Arsenic peaking should not be taken lightly. With the MCL measured in units of parts per billion, it does not take much release of arsenic to exceed the MCL for arsenic.

Comment 7: 5.2.3.1g typo? [may be local computer interpretation as item is made up of 3 characters] (Joel Helms)

Response 7: This character should be a micron symbol. A typographical error was likely introduced during conversion to the Adobe PDF file.

**OAC 3745-91-08, Rule by reference to "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**

Comment 8: Page 3, definitions of "average day" and "maximum day": These definitions are incorrect for the purpose of this document. The use of water consumption in the definition is not appropriate. When a water utility uses the term water consumption, it can include the water gained (or lost) in the distribution system storage tanks. This document must better define the terms used and identify where or how the value must be measured. Does average day consumptions mean in the distribution system or pumpage from the water treatment plant? Without better defining these terms, the entire intent of the document is in question. (Verna Arnette, Greater Cincinnati Water Works)

Response 8: Distribution system storage tanks are used to address instantaneous and peak-hour demands. The finished water rate leaving the WTP must be capable over the course of a day to meet the average day and maximum day demands, without reliance on distribution system storage. Therefore, the current definitions of "average day demand" and "maximum day demand" are considered to be appropriate. For clarification, a definition was added for "consumption" to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 9: Page 3, definition of "peak hour demand": A peak hour demand value typically applies to the distribution system and includes changes in water storage. By applying this to water treatment plants, as shown in the examples, the capacity of the water treatment is unfairly reduced, because water utilities rely on distribution system storage to handle peak hour demands. The peak hour demand of a distribution system with storage tanks cannot be applied to "calculating" the capacity of the water treatment plant. (Verna Arnette, Greater Cincinnati Water Works)

Response 9: For clarification, a definition was added for "consumption" to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 10: Page 3, definition of "peak hour of treatment": This document suggests that WTPs operate at hourly rates that are higher than the design rate. WTP unit processes are designed for maximum day conditions using design criteria similar to those listed in the document. If a WTP is designed for 10 mgd, then the detention times, surface loading rates, weir overflow rates, etc are based on 10 mgd, or an equivalent hourly or gpm rate. (Verna Arnette, Greater Cincinnati Water Works)

Response 10: The term "peak hour of treatment" is defined because it is used in the surface water treatment rules. Instantaneous rates can be higher than the approved capacity, as long as the average rate at which the WTP is operated over the course of the day does not exceed the WTP's approved capacity. However, operating a component at an instantaneous rate exceeding the approved capacity may make it difficult to maintain compliance with other rules (e.g. turbidity).

Comment 11: Page 4, "Water System": Throughout the document, the term "water system" and "public water system" are used interchangeably. This leads to confusion and misinterpretation and must be fixed. (Verna Arnette, Greater Cincinnati Water Works)

Response 11: For clarification, the term "water system" has been replaced with "source/WTP system" or "public water system" where appropriate.

Comment 12: Page 4 "WTP Design": The term "peak hour water demand" must be deleted. This term deals with the distribution system and its storage and has nothing to do with the treatment plant. (Verna Arnette, Greater Cincinnati Water Works)

Response 12: For clarification, a definition was added for "consumption" to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 13: Page 5, "The approved capacity of the WTP, Item (3) *delivered to the distribution system at a flow rate equivalent to the design year, peak hour demand* – this item is inappropriate for determining the approved capacity of the WTP because it does not account for distribution system storage. (Verna Arnette, Greater Cincinnati Water Works)

Response 13: The water system's historical peak hour demands reflect the system's distribution storage and are a significant factor in projecting the design year, peak hour demand, as defined in the document. For clarification, a definition was added for "consumption" to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 14: Page 5 (top of page 6) Section V, last paragraph reads as follows:

Any component that is operated at an average rate:

- over a 24-hour period, or
- the period during the day the component is in operation if the source and/or WTP component is not operated 24 hours each day, or
- with too many units of the component out-of-service

that exceeds the water system's approved capacity will result in a "violation of plan approval." Two components: 1) a pump station, except for well pumps, and 2) a clearwell can limit the approved capacity of the water system (i.e., the components are too small), but operation of these components can not lead to a violation of plan approval.

Water systems that have an approved capacity for an individual treatment component that is greater than the water system's approved capacity should not be held in violation of plan approval if the flow rate through a component exceeds the approved capacity. For example, at our Richard Miller Treatment Plant (RMTP), our Lamella/reservoir system (which is the approved coagulation, flocculation and sedimentation facility for the plant) is rated for a flow rate of 260 mgd for 5 months of the year. This capacity was obtained through an Ohio EPA approved demonstration study. The current approved capacity of the RMTP is 220 mgd. According to the paragraph above, we could not operate the Lamella/reservoir component of the plant at a rate higher than 220 mgd. The cited paragraph above should be revised to account for situations such as this. (Verna Arnette, Greater Cincinnati Water Works)

Response 14: A sentence has been added on page 6 of the document indicating "A component can be operated at an average rate

over a 24 hour period higher than the approved capacity of the source/WTP system as long as:
a) the component capacity is not exceeded, and
b) the upstream or downstream component does not exceed its component capacity."

Comment 15: Page 7, "demand projections must be performed by water systems every five years": Most water utilities use a variety of methods to estimate future water demands to help plan future facilities and capital improvements. However, the document suggests that it is very common that average and maximum day demands continue to increase in the future. The reality is that most utilities in Ohio do not experience an increasing trend in water demand, unless they expand their system. To require water utilities to perform future demand studies every five years, even when the utility experiences no increase (or even a decrease) in water demands is unreasonable an inefficient use of limited operating funds. (Verna Arnette, Greater Cincinnati Water Works)

Response 15: Unfortunately, many water systems routinely operate too close to their approved capacity jeopardizing the integrity of their treatment, do not adequately plan for future needs, or are unable to convince their decision makers capital improvements are needed. Performing demand projections and appropriate planning is an important aspect of properly operating a water system, both now and in the future. The five year period was determined based on one year for study, one year to select a design professional, one year for design, and two years for construction.

Further, Ohio EPA has not specified the method to be used when developing these projections, and anticipates projections would be relatively straight-forward for a system not experiencing an increase in demand. It may not be necessary to hire a professional engineer.

Comment 16: Also on page 7, the peak hour demand should be deleted from Figure 1, because it cannot be applied to WTPs or water supply sources. (Verna Arnette, Greater Cincinnati Water Works)

Response 16: The use of peak hour demand is necessary to determine the component capacity of finished-water pumps.

Comment 17: Page 8, Under the four bullets at the top of the page: The term "upgrading" an existing WTP must be defined. It should

read “upgrading WTP unit process components”. There are many other upgrades to WTP that have nothing to do with the unit processes or their operation. (Verna Arnette, Greater Cincinnati Water Works)

Response 17: The statement has been changed to “expanding an existing WTP”. Also, a definition was added for “upgrade” of a water-supply source or WTP component is a plan approval for which no change in approved capacity is being requested.

Comment 18: Page 13, The statement that it is easier for WTPs to meet these regulatory requirements by operating at a fairly constant flow rate each day over a 24-hour period is not appropriate. Water utilities have a responsibility to operate efficiently and cost effectively. Operating at a constant flow rate is in most cases very inefficient and not cost effective from an energy management standpoint. (Verna Arnette, Greater Cincinnati Water Works)

Response 18: The statement has been changed to “It may be easier for WTPs…” to allow for such considerations.

Comment 19: Page 14, top of page: Finished water pumps are not designed to meet the design year, peak-hour demand. Water utilities have distribution system storage tanks that buffer the peak hour demand such that the WTP and finished water pumps are not directly affected by the peak hour demand. (Verna Arnette, Greater Cincinnati Water Works)

Response 19: For clarification, a definition was added for “consumption” to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 20: Page 16 through 19: The document should provide examples that are representative of the water industry in Ohio. Examples of membrane softening and surface water plants with off line reservoirs are certainly not typical of all the water plants across the State. By using only those examples, it makes the entire document very difficult to understand to all the utilities across the State, most of which use different and simpler processes. The document must be prepared using examples that are the “norm” not the exception. By making this document overly cumbersome and difficult to understand, it will force utilities to hire

expensive consultants to help them determine the requirements and impact of this document on their utility. (Verna Arnette, Greater Cincinnati Water Works)

Response 20: The example described in Figure 10 was provided to demonstrate that pump station number 1 must deliver the average day water demand, and pump station number 2 must deliver the maximum day water demand. The membrane example was provided because many small public water systems are considering use of membranes, and membranes have a high percentage of wastage of source water.

Comment 21: Page 21, example calculations at the bottom of the page Why is the term 1.0 applied to the Pump Station 2? This must be explained. (Verna Arnette, Greater Cincinnati Water Works)

Response 21: Pump Station 2 is multiplied by 1.0 because it is designed on a maximum day demand basis and the component capacity is being converted to equivalent maximum day. For clarification, the type of demand the component is designed to meet has been added to the description of each component.

Comment 22: Page 24, tube settlers: The application rate of tube settlers should be "as justified by an engineering submission" similar to plate settlers. (Verna Arnette, Greater Cincinnati Water Works)

Response 22: In accordance with the 2007 Recommended Standards for Water Works (also referred to as Ten States Standards or TSS) Section 4.1.6.1.d, tube settler application rates greater than 2 gpm per square foot of cross-sectional area must be successfully shown through pilot plant or in-plant demonstration studies.

Comment 23: Page 31 (top of page 32) reads as follows:

**8. Intermediate and Finished-water pumping**

Intermediate pumping components must be able to supply the maximum-day demand with the largest unit out-of-service, and finished-water pumping components must be able to supply the maximum pumping demand (i.e., the larger of peak-hour water demand or

fire-flow demand for the water system) with the largest unit out-of-service (See **Figure 12**).

This paragraph does not take into account distribution system storage and would require high service pumps to be sized for peak hour distribution system demands, although Figure 12 (page 32) appears to indicate this was not the intention of the proposed document. However, in the example cited on page 32 of the document, the finished water pumps were de-rated based on supplying a peak hour demand as opposed to a maximum day demand. Please clarify, as many water systems rely on distribution system storage to meet peak hour demands, and do not rely solely on high service pump capacity to meet peak hour consumption. (Verna Arnette, Greater Cincinnati Water Works)

Response 23: For clarification, a definition was added for "consumption" to mean the rate at which finished water leaves the WTP to satisfy domestic, public (including fire flow), and industrial water uses, and accounted for and unaccounted for water losses.

Comment 24: Page 32, bottom of page: The intent of the last paragraph must be clarified. The purpose of this document (as stated on page 1) was not to address the water distribution system because of various complexities. Since the distribution system contains the majority of pump stations, a discussion about pump stations and their capacities at the bottom of page 32 is inappropriate. (Verna Arnette, Greater Cincinnati Water Works)

Response 24: The definition for WTP components was clarified to indicate finished water pumps addressed in this document are considered to be those withdrawing directly from the clearwell to convey finished water to the distribution system.

Comment 25: Page 33, top of page: The statement that hydraulic modeling must be used to demonstrate pump station operations and capacity must be deleted. A hydraulic model is a tool, but not the only tool that can be used to determine how a distribution system interacts with pump stations. There are many other ways to accomplish this with using up to date and calibrated hydraulic models. (Verna Arnette, Greater Cincinnati Water Works)

Response 25: Reference to hydraulic modeling was removed from the document.

**Miscellaneous Comments**

Comment 26: There is a conflict in the code in that this 'distribution' chlorine was not considered a 'treatment' and therefore did not trigger the twice a week visit by operator for a Class A system. There remains a question even if this required CT of raw water is a treatment. If it is there for preventive maintenance and not actually reducing any biological threats, it is not treatment. If it serves a purpose, then it is not a ground water source. This confusion could be cleared up possibly with just changing the title on paragraphs in policy? (Joel Helms)

Response 26: Chlorination is considered treatment. However, for the purposes of public water system classification and minimum staffing requirements in OAC Chapter 3745-7, booster chlorination facilities within the distribution system do not trigger a water system to be considered a Class A system. Additionally, OAC Chapter 3745-7 is outside the scope of this rulemaking.

Comment 27: None-the-less there is distinct conflict that December of 2006 code only requires one visit [possibly two], that the October 2006 code requires daily visits to measure residual Chlorine. These issues of apparent conflict should be delineated in manual. Possible is that the required 'owner observation' could entail record of use of chlorine in holding tank by elevation, and no testing except weekly by operator. (Joel Helms)

Response 27: The two requirements you discuss are not in conflict. The one visit (possibly two) you mention is in reference to Ohio Administrative Code (OAC) Rule 3745-7-03(C) which requires a properly certified operator of record to be physically present onsite at the facility for a minimum staffing requirement. The second requirement for daily visits seven days per week, established in OAC Rule 3745-7-03(D), shall be performed by the owner, supplier, or his representative and does not have to be a certified operator. These provisions are included to ensure compliance with the operational requirements of OAC Rule 3745-83-01 which require certain samples to be taken on a daily basis. OAC

Rule 3745-83-01 does not require the samples to be collected or analyzed by a certified operator. Therefore, samples may be taken by any person acceptable to the Director. Additionally, neither of these rules is within the scope of the current rule revisions.

Comment 28: Another issue not technically in front at this time, is that usually only free or combined measurement is needed, not both. This duel test is waste of resources. (Joel Helms)

Response 28: Chlorine chemistry is such that it may occur in both free and combined forms. All community public water system and noncommunity systems that serve greater than 1000 people are required by OAC 3745-83-01 to maintain a minimum chlorine residual of at least 0.2 milligram per liter (mg/L) free chlorine, or 1 mg/L combined chlorine. Thus, it is necessary to measure both forms of chlorine to determine compliance with the rule. Additionally, OAC rule 3745-83-01 is outside the scope of this rulemaking.

Comment 29: With the newly required source disinfection requirement, there is no time that a system can be observed or checked for actual contamination. Contamination will never be detected except for failure of injection devices. There should be a procedure were all chlorination is terminated for a period of time to verify if the system is 'pure'. A scheduled three day with notice to consumers would fulfill this purpose. Now it is considered a violation to purposefully terminate chlorination. Taking a raw water sample is not sufficient as system is more susceptible to distribution trouble than source. As the systems become larger this issue become meaningless, but for small systems with no hourly supervision, most critical. (Joel Helms)

Response 29: Intentionally discontinuing required disinfection would cause unnecessary burden and health risks to the consumers of the water, as well as being a violation of OAC rule 3745-83-01. Properly operating the system and performing timely preventative maintenance and repair tasks are more appropriate ways to ensure the integrity of the distribution system is maintained. Additionally, OAC rule 3745-83-01 is outside the scope of this rulemaking.

Comment 30: Definition of 'Service Connection' needs updated. Attorney General [AG] says every unit of a multiple occupied building is a Service Connection even if feed from multiple lines that

are by design unable to have meters installed. Of critical mass is that the Hot water system becomes part of 'distribution system' and chlorine monitoring is of questionable function but technically required. (Joel Helms)

Response 30: This is outside the scope of the current rulemaking. In addition, it has now become a point of law with the issuance of a judicial decision on the subject.

Comment 31: In a one building PWS is the softner a Point-of-Entry or part of distribution treatment? (Joel Helms)

Response 31: Neither; it would be considered central treatment.

Comment 32: The code requires a PTI to dismantle a treatment system. According to AG, no permit is required to change a PWS to join a larger PWS therefore abandoning treatment system. Do we not dismantle for a year the treatment system? (Joel Helms)

Response 32: This is outside the scope of the current rulemaking. However, in general, Ohio EPA does not require formal plan approval for dismantling a public water system, but it may be necessary to submit documentation.

Comment 33: There is no provision in code to 'pause' a PWS that by definition falls below required 25 people for some regulator inhibition that without such inhibition would increase above said 25 limit. We originally informed EPA of such reduction but are now being sued for seven years of tests not performed when we could not by definition be a PWS but continued to apply for licensing because of anticipation of revising population. (Joel Helms)

Response 33: This is outside the scope of the current rulemaking. However, both population and number of service connections must be below the statutory requirements. If a water system falls below 25 people and/or 15 service connections, you should notify Ohio EPA and we may deactivate the system in our files. It may be necessary to submit documentation prior to deactivating to ensure the system is below both the population and service connection requirements.

**End of Response to Comments**