



MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

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Date: August 6, 2009

To: MPWMD Staff, Consultants and Interested Parties

From: Darby Fuerst, General Manager *Darby Fuerst*

**SUBJECT: WATER DISTRIBUTION SYSTEM MEMORANDUM #6 –
CALCULATION OF CONVEYANCE AND WATER TREATMENT
LOSSES FOR WATER DISTRIBUTION SYSTEMS**

This Water Distribution System (WDS) Memorandum #6 is written to clarify how “conveyance losses” (i.e., the difference between production and consumption due to leaks and other distribution losses) and “water treatment” losses due to certain types of water treatment processes, if applicable, may be estimated in an application for a WDS permit from the Monterey Peninsula Water Management District (MPWMD or District) pursuant to Rules 20, 21 and 22. This information will be considered as part of the determination of an appropriate system capacity (annual production limit) in acre-feet per year (AFY) as a mandatory condition of approval for a WDS permit. The District goal is to set an accurate and reasonable production limit that accounts for estimated consumptive use, and losses due to conveyance and water treatment, where appropriate. The combined losses may also be called “system losses.”

An applicant is not required to request that system losses be considered, for example, when the details about a future home and landscaping are unknown. The applicant may instead request that the standard baseline of 0.5 AFY be used by the District for a conceptual single-family home on a large lot; this number already includes system losses.

Conveyance Losses

In its calculations, the District will allow a conveyance loss factor of a five percent (5%) for a new or amended WDS, unless a higher factor is specifically requested with a written rationale, and is approved in writing by the General Manager or his designee. Most WDS applications are for smaller water systems serving fewer than 10 connections in a limited area. The 5% factor is less than the 7% loss standard set for California American Water (CAW) in District Rule 160 because CAW is a much larger, complex system. It is recognized that systems become less efficient over time as they age. At the same time, the District wishes to promote careful maintenance of water systems to avoid leaks and other water waste. Thus, the 5% factor is considered to be appropriate for smaller systems. *The annual production limit should be calculated as follows when using a 5% conveyance loss factor:*

Estimated water needs (using MPWMD forms) divided by 0.95 = required production
Example: 1 AFY / 0.95 = 1.053 AFY (display three decimals)

Water Treatment Losses

Some water treatment is needed for certain situations due to poor water quality, typically identified shortly after the well capacity test via formal testing by a certified laboratory. The type of treatment needed depends on the type and concentration of the reported constituents. The calculations described in this memorandum focus only on systems where some or all of the water supply from the well must be treated by Reverse Osmosis (RO) units or similar equipment that generates a concentrated waste discharge, in order to meet desired water quality. As a general indicator, the desire for RO treatment may occur when the Total Dissolved Solids (TDS) concentration exceeds 1,000 mg/L (refer to Titles 17 and 22 in California Code of Regulations; see "Consumer Acceptance Contaminant Level Ranges," Table 64449-B) and/or if a particular constituent that typically requires RO for treatment is substantially greater than the state standard (see other tables in 17 CCR and 22 CCR). Evidence of required treatment may be provided as follows:

- Information from Monterey County Health Department (MCHD) such as letters, permit conditions, or citation of County rules for multiple-parcel systems, or for certain residential or non-residential single-parcel situations that entail MCHD oversight;
- Assessment by qualified consultant (with rationale) that treatment will likely be needed for a single-parcel (or other) situation even though not required by MCHD.

This memorandum does not recognize the following situations unless a specific exception (with numerical calculations) with a written rationale is submitted and is approved in writing by the General Manager or his designee:

- Simple point-of-use ("under the sink") RO filtration units (or other method);
- System filtration or any water treatment method where a substantive waste discharge stream is not generated;
- Situations where only a small portion ($\leq 25\%$) of the overall production is treated (for example: a home on a large parcel with extensive irrigation, where only the water destined for potable use in the home is treated).

An RO treatment loss factor for qualified situations as described above shall be 15% (unless another factor is approved by the General Manager). ***The annual production limit shall be calculated as follows for a 15% water treatment loss factor:***

Estimated water use (using MPWMD forms) divided by 0.85 = required production

Example: $1 \text{ AFY} / 0.85 = 1.176 \text{ AFY}$ (display three decimals)

Combined Conveyance and Treatment Losses

If both a 5% conveyance and 15% RO treatment loss are anticipated, a shortcut would be to divide the estimated consumptive water use amount by 80.75% ($0.95 \times 0.85 = .8075$). Thus, for the 1 AFY example above, the result would be: $1 \text{ AFY} / 0.8075 = 1.238 \text{ AFY}$.

This result is very similar to the two-step process:

$1 \text{ AFY} / 0.95 = 1.053 \text{ AFY}$

$1.053 \text{ AFY} / 0.85 = 1.239$ (round the final result to two places, or 1.24 AFY)

If the applicant wishes to obtain MPWMD approval for these system and treatment losses, the applicant should coordinate with his/her qualified hydrogeology consultant to ensure that the consultant includes the total production anticipated, including these loss factors, as applicable, in the consultant's hydrogeologic report submitted along with the application. MPWMD will not approve a request for additional production to account for conveyance and water treatment losses if these quantities are not included in the consultant's hydrogeologic report. The report must demonstrate that the well can reliably produce adequate supply to meet the estimated demands, will not adversely affect the ability of existing systems (typically neighboring wells) to provide water, and will not result in significant environmental effects. For further information, please refer to MPWMD Rules 22-B and 22-C for WDS approval requirements, and to the MPWMD *Procedures for Well Source and Pumping Impact Assessment* for testing and assessment protocol. Refer to the District website as follows:

<http://www.mpwmd.dst.ca.us/rules/2009July/TOC.htm>

http://www.mpwmd.dst.ca.us/pae/wds/WDSPermits/WellAssessProcedures_ver3edit_14sep05.pdf

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