Arizona Department of Environmental Quality
Drinking Water Analytical Report
Stage 2 Disinfection By-Products (TTHM & HAA5), Operational Evaluation Level Report
Limited Scope – Treatment

PRINT

Treatment Process Evaluation Checklist

☐ **NO DATA AVAILABLE**

Facility Name: _____ PWS ID: AZ04- ☐☐☐☐☐

Checklist Completed by: _____ Date: _____

A. Review finished water data for the time period prior to the OEL exceedance(s) and compare to historical finished water data using the following questions:

Were DBP precursors (TOC, DOC, SUVA, bromide, etc.) higher than normal?	☐ Yes	☐ No
Was finished water pH higher or lower than normal?	☐ Yes	☐ No
Was the finished water temperature higher than normal?	☐ Yes	☐ No
Was finished water turbidity higher than normal?	☐ Yes	☐ No
Was the disinfectant concentration leaving the plant(s) higher than normal?	☐ Yes	☐ No
Were finished water TTHM/HAA5 levels higher than normal?	☐ Yes	☐ No
Were operational and water quality data available to the system operator for effective decision making?	☐ Yes	☐ No

B. Does the treatment process include predisinfection? ☐ Yes ☐ No

If NO, proceed to item C. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was disinfected raw water stored for an unusually long time?
☐	☐	Were treatment plant flows lower than normal?
☐	☐	Were treatment plant flows equally distributed among different trains?
☐	☐	Were water temperatures high or warmer than usual?
☐	☐	Were chlorine feed rates outside the normal range?
☐	☐	Was a disinfectant residual present in the treatment train following predisinfection?
☐	☐	Were online instruments utilized for process control?
☐	☐	Did you switch to free chlorine as the oxidant?
☐	☐	Was there a recent change (or addition) of pre-oxidant?
☐	☐	Did you change the location of the predisinfection application?

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C. Does your treatment process include presedimentation? ☐ Yes ☐ No

If NO, proceed to item D. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were flows low?
☐	☐	Were flows high?
☐	☐	Were online instruments utilized for process control?
☐	☐	Was sludge removed from the presedimentation basin?
☐	☐	Was sludge allowed to accumulate for an excessively long time?
☐	☐	Do you add a coagulant to your presedimentation basin?
☐	☐	Was there a problem with the coagulant feed?

D. Does your treatment process include coagulation and/or flocculation? ☐ Yes ☐ No

If NO, proceed to item E. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were there any feed pump failures or were feed pumps operating at improper feed rates?
☐	☐	Were chemical feed systems controlled by flow pacing?
☐	☐	Were there changes in coagulation practices or the feed point?
☐	☐	Did you change the type or manufacturer of the coagulant?
☐	☐	Do you suspect that the coagulant in use at the time of the OEL exceedance did not meet industry standards?
☐	☐	Did the pH or alkalinity change at the point of coagulant addition?
☐	☐	Were there broken or plugged mixers?
☐	☐	Were flow rates above the design rate or was there short-circuiting?

E. Does your treatment process include sedimentation or clarification? ☐ Yes ☐ No

If NO, proceed to item F. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Were there changes in plant flow rate that may have resulted in a decrease in settling time or carry-over of process solids?
☐	☐	Were settled water turbidities higher than normal?
☐	☐	Was there any disruption in the sludge blanket that may have resulted in carryover to the point of disinfection?
☐	☐	Was there any maintenance in the basin that may have stirred sludge from the bottom of the basin and caused it to carry over to the point of disinfectant addition?
☐	☐	Was sludge allowed to accumulate for an excessively long time or was there a malfunction in the sludge removal equipment?

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F. Does your treatment process include filtration? ☐ Yes ☐ No

If NO, proceed to item G. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was there an increase in individual or combined filter effluent turbidity or particle counts?
☐	☐	Was there an increase in turbidity or particle loading onto the filters?
☐	☐	Was there an increase in flow onto the filters or malfunction of the rate of flow controllers?
☐	☐	Were any filters taken off-line for an extended period of time that caused the other filters to operate near maximum design capacity and creating the conditions for possible breakthrough?
☐	☐	Were any filters operated beyond their normal filter run time?
☐	☐	Were there any unusual spikes in individual filter effluent turbidity (which may indicate particulate or colloidal TOC breakthrough) in the days leading to the excursion?
☐	☐	Were all filters run in a filter-to-waste mode during initial filter ripening?
☐	☐	If GAC filters are used, is it possible the adsorptive capacity of the GAC bed was reached before reactivation occurred (leave blank if not applicable)?
☐	☐	If biological filtration is used, were there any process upsets that may have resulted in the breakthrough of TOC (leave blank if not applicable)?

G. Does your treatment process include primary disinfection by injecting chlorine prior to a clearwell? ☐ Yes ☐ No

If NO, proceed to item H. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was there a sudden increase in the amount of chlorine fed or an increase in the chlorine residual?
☐	☐	Was there an increase in clearwell holding time?
☐	☐	Was the plant shut down or were plant flows low?
☐	☐	Was there an increase in clearwell water temperature?
☐	☐	Did you switch to free chlorine recently as the primary disinfectant?
☐	☐	Was the inactivation of *Giardia* and/or viruses exceptionally high?
☐	☐	Was there a change in the mixing strategy (i.e. mixers not used, adjustment of tank level)?

H. Does your plant recycle spent filter backwash or other streams? ☐ Yes ☐ No

If NO, proceed to item I. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Did a change in the recycle stream quality contribute to increased DBP precursor loading that was not addressed by treatment plant processes?
☐	☐	Did a recycle event result in flows in excess of typical or design flows?

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I. Do you inject a disinfectant after your clearwell to maintain a distribution system residual? ☐ Yes ☐ No

If NO, proceed to item J. If YES, answer the following questions for the period in which an OEL exceedance occurred:

Yes	No	
☐	☐	Was there a sudden increase in the amount of chlorine fed?
☐	☐	Was there a switch from chloramines to free chlorine for a burnout period?
☐	☐	If using chloramines, was the chlorine to ammonia ratio in the proper range?
☐	☐	Was there a problem with either chlorine or ammonia mixing?

J. Did concern about complying with a rule other than Stage 2 DBPR, such as the Lead and Copper rule, the LT2ESWTR, or any other rule constrain your options to reduce the DBP levels at this site? For example, are you limited by other treatment targets/requirements in your ability to control precursors in coagulation/flocculation? ☐ Yes ☐ No

If NO, proceed to item K. If YES, explain below and consult EPA's *Simultaneous Compliance Guidance Manual* for alternative compliance approaches.

_____

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K. **Conclusion**

Did treatment factors and/or variations in the plant performance contribute to the OEL exceedance(s)? ☐ Yes ☐ No ☐ Possibly

If YES or POSSIBLY, explain below.

_____

_____

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Please mail completed form to:
Arizona Department of Environmental Quality
Water Quality Data Unit, MC 5415B-1
1110 West Washington Street
Phoenix, AZ 85007

Questions Regarding TTHM / HAA5:
Call (602) 771-4641
Within AZ (800) 234-5677, ext. 771-4641
Fax (602) 771-4505