

Water Treatment Plant Optimization Goals

What is water treatment plant optimization?

- The process of improving the performance of particulate removal treatment beyond regulatory requirements without making major capital expenditures.

What are water treatment plant optimization goals?

- Treatment plant optimization goals are turbidity goals established to assist water systems in making process improvements to optimize particulate removal with the goal of reducing the potential for microbial contamination.
- Water treatment plant optimization goals are as follows:

Water Treatment Plant Optimization Goals		
SEDIMENTATION (for conventional systems)	Turbidity Goal	Criteria
Settled water	≤ 2.0 NTU, 95% of the time.	If average annual raw water turbidity is > 10 NTU
Settled water	≤ 1.0 NTU, 95% of the time.	If average annual raw water turbidity is ≤ 10 NTU
FILTRATION (conventional and direct systems)	Turbidity Goal	Criteria
IFE and CFE filtered water	<ul style="list-style-type: none"> • Turbidity ≤ 0.10 NTU, 95% of the time • Max turbidity ≤ 0.30 NTU. 	Based on maximum values recorded during 4-hour increments (excluding the 15 minute period following backwash)
IFE filtered water after backwash	<ul style="list-style-type: none"> • Turbidity returns to ≤ 0.10 NTU within 15 minutes after backwash. • Max spike ≤ 0.30 NTU. • Turbidity at return to service ≤ 0.10 NTU. 	Goals apply to both systems with and without filter-to-waste capability. Goals apply to the backwash recovery period starting immediately after backwash.

IFE = individual filter effluent. CFE = combined filter effluent.

Why optimize?

- Improve microbial removal.
- Research and field work demonstrate that optimizing particle removal processes improve public health protection from microbial contamination.

How do I adopt and attain optimization goals?

- Share this information with all the water treatment plant operators and management staff so that the internal support for attaining these goals is gained.
- Evaluate current treatment practices for areas where performance can be improved (optimized).
- Establish data gathering practices and develop procedures for measuring and recording raw, settled, and filtered water turbidity.
- Track turbidity data and compare results with optimization goals.

If you have any questions regarding Water Treatment Plant Optimization Goals or would like further assistance in optimizing your treatment processes or obtaining available optimization assessment software, please contact Evan Hofeld at 971-200-0288 or evan.e.hofeld@oha.oregon.gov.

Recommended Data Collection for Demonstrating Performance with Optimization Goals (not for regulatory compliance)	
Settled Water Turbidity Goal (for conventional systems)	Sampling
<p>≤ 2.0 NTU, 95% of the time if average annual raw water turbidity is > 10 NTU.</p>	<p>Sampling data is derived from daily grab sampling of raw water turbidity and on-line settled water turbidity with a data acquisition frequency of ≤ 15 minutes in order to obtain the following information for input into the optimization Assessment Spreadsheet (OAS):</p> <p>Maximum daily values for the following parameters:</p> <ol style="list-style-type: none"> 1. Raw water turbidity. 2. Settled water turbidity of each sedimentation basin. (up to 4 basins)
<p>≤ 1.0 NTU, 95% of the time if average annual raw water turbidity is ≤ 10 NTU.</p>	
Filtered Water Turbidity Goal (conventional and direct systems)	Sampling
<ul style="list-style-type: none"> ● IFE and CFE turbidity ≤ 0.10 NTU, 95% of the time ● Max IFE and CFE turbidity ≤ 0.30 NTU. 	<p>Sampling data is derived from on-line IFE and CFE turbidimeters with a data acquisition frequency of ≤ 1 minute (excluding the 15 minute period following backwash) in order to obtain the following information based on maximum values recorded during 4-hour increments for input into the OAS:</p> <p>maximum daily values for the following parameters:</p> <ol style="list-style-type: none"> 1. Filtered water turbidity of each filter. (up to 12 filters) 2. Combined filter effluent
<p>For IFE filtered water after backwash:</p> <ul style="list-style-type: none"> ● Turbidity returns to ≤ 0.10 NTU within 15 minutes after backwash. ● Max spike ≤ 0.30 NTU. ● Turbidity at return to service ≤ 0.10 NTU. <p>Goals apply to both systems with and without filter-to-waste (FTW) capability. Goals apply to the backwash recovery period starting immediately after backwash.</p>	<p>Sampling is recommended at 1 minute increments until the turbidity levels off and such that the data is sufficient to gather the following information for input into the Filter Backwash spreadsheet:</p> <p>For filters with filter-to-waste (FTW) capability:</p> <ol style="list-style-type: none"> 1. Max. turbidity during FTW period; 2. Turbidity at end of FTW period; and 3. FTW time. <p>For filters without FTW capability:</p> <ol style="list-style-type: none"> 1. Max. turbidity during initial 15 minutes of filter run; and 2. Turbidity after 15 minutes of filter run.