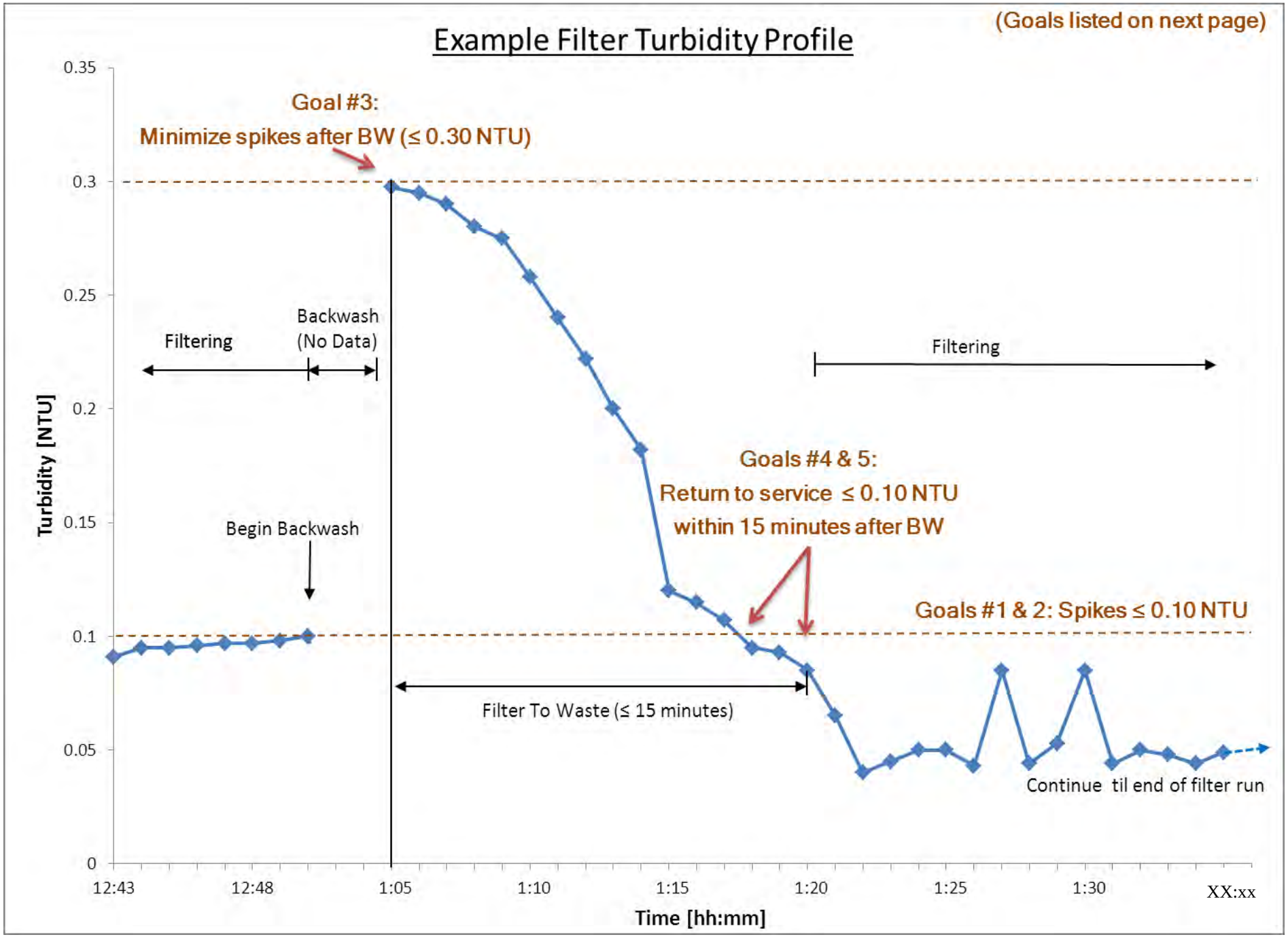
(Goals listed on next page)
Example Filter Turbidity Profile
Goal #3:
Minimize spikes after BW (≤ 0.30 NTU)
Filtering
Backwash
(No Data)
Filtering
Goals #4 & 5:
Return to service ≤ 0.10 NTU
within 15 minutes after BW
Begin Backwash
Goals #1 & 2: Spikes ≤ 0.10 NTU
Filter To Waste (≤ 15 minutes)
Continue til end of filter run
Turbidity [NTU]
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
12:43
12:48
1:05
1:10
1:15
1:20
1:25
1:30
XX:xx
Time [hh:mm]

Revised: Spring 2015

Filter Turbidity Profile

Why do Oregon Regulations Require Quarterly Filter Turbidity Profiles?

- Filtration is the key unit process removing pathogens to make water safe
- Filtration is a complex dynamic process affected by: coagulation/flocculation, loading rate, surface wash, media health, rate-of-flow controls (*e.g.*, valving), etc.
  - Filter profiles are a tool to assure these related processes perform correctly
- Discover times and reasons when turbidity increases pass through the filter
- Ability to detect (good & bad) trends when monitoring the process over time

Elements of a Good, Complete, Typical Filter Turbidity Profile

- Clear times and turbidities on axes
- Description of backwash trigger
- Backwash start/finish times
- Filter-to-waste begin/end
- When filter is put back into service
- Filtered water turbidities & duration
- Explanation of any turbidity spikes
- Describe loading rate changes, if any

Filter Optimization: Going Beyond the Regulations

What is water treatment plant optimization?

- The process of improving the performance of particulate and pathogen (*Giardia* & *Cryptosporidium*) removal treatment beyond regulatory requirements without making major capital expenditures.

Why optimize (particularly when it is not required by the state)?

- Improve pathogen removal from drinking water, thereby increasing public health protection
- Increase robustness of your plant's treatment processes, improving resilience during upsets

How could I optimize my treatment plant?

- Track turbidity data and compare results with optimization goals illustrated on example graph
- Establish data gathering practices/procedures for recording raw, settled, & filtered water turbidity
- Evaluate coagulant(s) and filter aid dose using jar tests, consultations or Circuit Rider if
  - Are you using the right chemical
  - Are you overdosing/underdosing coagulant
- Evaluate Backwash
  - Check if your plant's bed expansion exceeds 20% without losing media (use a Secchi Disk)
  - Measure backwash flowrate and duration, then compare to design specifications
  - Measure backwash trough turbidity: End backwash with turbidity around 10 to 15 NTU
- Consider resting your filter 1 to 24 hours after backwash before filter-to-waste to minimize spikes
- Consider shortening filter if run times (if over 72 hours)

Filter optimization goals illustrated on example turbidity profile graph:

1. Turbidity is less than 0.1 NTU 95% of the time during filtration
2. Filtered turbidity never exceeds 0.3 NTU
3. Maximum turbidity spike after backwash is less than 0.3 NTU
4. Turbidity level returns to 0.1 NTU (or less) within 15 minutes after backwash
5. Turbidity level returns to service at less than 0.1 NTU

For more info. call us at 971.673.0405, or check out our surface water treatment website: healthoregon.org/swt