Clean Water Services

February 21, 2014

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Water Quality Division
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Re: 2012 Draft Integrated Report

Thank you for the opportunity to review the draft 2012 Integrated Water Quality Assessment Report. Clean Water Services is a water resource management utility that serves more than 542,000 customers mostly in the urban portion of Washington County, Oregon. Clean Water Services is committed to protecting water resources in the Tualatin River Watershed through innovative wastewater and stormwater services, flood management projects, water quality and stream enhancement projects, fish habitat protection and more. For these reasons, we have focused our comments on the proposed listings in the Tualatin River watershed.

As the methodology document notes, DEQ's 2012 Integrated Water Quality Assessment Report provides information on the water quality of all navigable state waters. As required by Section 303(d) of the Clean Water Act, the Integrated Water Quality Assessment Report also identifies waterbodies that do not meet water quality standards. Total Maximum Daily Loads (TMDLs) are then developed for the identified waterbodies. TMDLs include load allocations for non-point sources and background conditions, and wasteload allocations for point sources. Wasteload allocations are then incorporated into NPDES permits. Thus, the Integrated Water Quality Assessment Report triggers TMDLs for water quality limited streams, and wasteload allocations that are eventually incorporated into NPDES permits.

In situations where a waterbody is on the 303(d) list but for which a TMDL has not been developed, the listings have a significant impact on the NDPES permit program. DEQ's Reasonable Potential Analysis (RPA) Internal Management Directive (IMD) requires NPDES permit holders to characterize their effluent and the receiving stream for 303(d) listed pollutants. Furthermore, the RPA IMD states that "the use of mixing zones and dilution values are generally not permitted for the listed pollutant parameters." This would mean that NPDES permit holders would have to meet water quality criteria at the end of pipe (i.e. no mixing zone) for 303(d) listed pollutants. Municipal and industrial stormwater permits are also affected by the 303(d) listings. Municipal stormwater permits require the development and implementation of specific best management practices to reduce 303(d) listed pollutants. Additionally, the general industrial stormwater permit (1200-Z) essentially prohibits the issuance of new stormwater permits to 303(d) listed streams unless the facility demonstrates that the 303(d) pollutant is not present at the site or demonstrates that the discharge meets criteria at the end of pipe, which is very difficult to do for common metals such as lead and zinc. Thus, the Integrated Water Quality Assessment Report has a significant impact on Oregon's water quality program.

It is imperative that that the water quality assessments and the 303(d) list are based on sound data and good judgment. Where additional data is needed to confirm a water quality issue, that data should be obtained prior to listing. In reviewing the draft 2012 Integrated Water Quality Assessment Report, we do not believe that DEQ has taken necessary steps in many cases to ensure the validity of the listing by closely examining the data and using the other available assessment categories (e.g. potential concern, insufficient data, etc.) effectively. Furthermore, we found that several listings were either not warranted, or should at least be narrowed (temporally and spatially) to more closely reflect the available data.

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Listing Methodology for Toxics
DEQ appears to have changed the listing threshold for toxics from the approach used in the 2010 Integrated Water Quality Assessment Report. The 2010 Integrated Water Quality Report used the following criteria for listing toxics:

Two (2) or more valid results not meeting the most stringent applicable criterion for concentrations of a specific toxic substance in the water column ***when these samples represent 5% or more of the total valid samples****;*
*(Page 51-****Methodology for Oregon's 2010 Water Quality Report And List of Water Quality Limited Waters)***

The 2012 Integrated Water Quality Report listed toxics based on two or more exceedances regardless of the number of valid samples. This approach is reasonable only where there is a limited data set. Clean Water Services has implemented a robust ambient monitoring program to characterize the Tualatin River watershed. Clean Water Services collects data for routine water quality parameters, nutrients, and metals at over 30 locations in the Tualatin watershed and has done so for more than a decade. For metals, there are more than 100 samples at several locations in the watershed. USGS and DEQ have also conducted monitoring in the watershed. As a result, the Tualatin River watershed has a rich data set. Listing based on two exceedances and without consideration of the number of samples penalizes entities like Clean Water Services that have implemented a robust ambient monitoring program. This approach would serve as a disincentive to implementing a robust ambient monitoring program. We believe that the methodology specified in the 2010 Report is a more effective approach to deal with rich datasets such as that available in the Tualatin Basin. Therefore, DEQ should use a 5% threshold for listing toxics.

Lead and Zinc
DEQ is proposing to list several stream in the Tualatin basin for lead and zinc. Table 1 summarizes the proposed listing for these two pollutants:

Table 1: Proposed Listings for Lead and Zinc

Stream	River Mile	Parameter
Beaverton Creek	0 to 9.8	Lead
Bronson Creek	0 to 6.5	Lead
Chicken Creek	0 to 7	Lead
Dairy Creek	0 to 10.1	Lead
Fanno Creek	0 to 13.9	Lead
Gales Creek	0 to 27.7	Lead
Rock Creek	0 to 18.2	Lead
Tualatin River	0 to 44.7	Lead
Tualatin River	55.9 to 72.9	Lead
Fanno Creek	0 to 13.9	Zinc
Tualatin River	0 to 44.7	Zinc

DEQ's proposed listings are based on the application of the previous total recoverable criteria and not the currently applicable dissolved criteria for lead and zinc. In 2013, EPA approved aquatic life criteria for lead, zinc and other metals based on the dissolved fraction. In December 2013, the EQC adopted the EPA approved criteria. As noted above, these listings have significant ramifications on the NDPES permit and

TMDL programs. Furthermore, there are public perceptions issues – listing the Tualatin River and most of its tributaries based on outdated criteria give the wrong impression regarding the state of water quality to the public. DEQ must ensure that the listings are based on comparison with currently applicable water quality criteria.

In addition to total recoverable lead and total recoverable zinc, Clean Water Services also analyzed samples for dissolved metals. So both total recoverable and dissolved lead and zinc data are available for the same sites and sample dates. Tables 2 and 3 present the total number of lead samples in the Tualatin River and tributaries, the number of exceedances of the dissolved lead criteria and the percent of samples that exceed the dissolved lead criteria. There are no exceedances of the dissolved lead criterion in the tributaries and very few in the mainstem Tualatin River but well below the 5% threshold. Similarly, Tables 4 and 5 present the total number of dissolved zinc samples, the number of exceedances, and the percent of samples that exceed the dissolved zinc criterion in the Tualatin River and Fanno Creek. There are no exceedances of the dissolved zinc criterion in either the mainstem Tualatin River or in Fanno Creek. Therefore, DEQ should remove the proposed listing for lead and zinc.

Table 2: Dissolved Lead in Tualatin River (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3701002	TR @ WEISS BR	97	0	0.0%
3701054	TR @ STAFFORD RD	98	0	0.0%
3701087	TR @ BOONES FERRY	98	1	1.0%
3701165	TR @ ELSNER	98	1	1.0%
3701271	TR @ SCHOLLS	97	0	0.0%
3701333	TR @ FARMINGTON	90	2	2.2%
3701391	TR @ ROOD ROAD	88	0	0.0%
3701450	TR @ HWY 219	97	1	1.0%
3701528	TR @ GOLF COURSE RD	96	1	1.0%
3701569	TR @ FERNHILL	36	0	0.0%
3701612	TR @ SPRINGHILL	97	1	1.0%
3701715	TR @ CHERRY GROVE	92	0	0.0%

Table 3: Dissolved Lead in Tualatin River Tributaries (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3810015	GALES CREEK @ NEW HWY 47	56	0	0.0%
3810070	GALES CREEK @ STRINGTOWN	56	0	0.0%
3815021	DAIRY CREEK @ HWY 8	56	0	0.0%
3815058	DAIRY CREEK @ SUSBAUER	56	0	0.0%
3820022	ROCK CREEK @ BROOKWOOD	56	0	0.0%
3821008	BEAVERTON CREEK @ GUSTON	55	0	0.0%
3821050	BEAVERTON CREEK @ 170TH	42	0	0.0%
3824020	BRONSON CREEK @ BRONSON PARK	33	0	0.0%
3824072	BRONSON CREEK @ SALTZMAN RD	33	0	0.0%
3835020	CHICKEN CREEK @ SCHOLLS-SHERWOOD	56	0	0.0%
3835060	CHICKEN CREEK @ KRUGER RD	56	0	0.0%
3840012	FANNO CREEK @ DURHAM RD	94	0	0.0%

Table 4: Dissolved Zinc in Tualatin River (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3701002	TR @ WEISS BR	96	0	0.0%
3701054	TR @ STAFFORD RD	97	0	0.0%
3701087	TR @ BOONES FERRY	97	0	0.0%
3701165	TR @ ELSNER	97	0	0.0%
3701271	TR @ SCHOLLS	96	0	0.0%
3701333	TR @ FARMINGTON	89	0	0.0%
3701391	TR @ ROOD ROAD	87	0	0.0%
3701450	TR @ HWY 219	96	0	0.0%
3701528	TR @ GOLF COURSE RD	96	0	0.0%
3701569	TR @ FERNHILL	36	0	0.0%
3701612	TR @ SPRINGHILL	96	0	0.0%
3701715	TR @ CHERRY GROVE	91	0	0.0%

Table 5: Dissolved Zinc in Fanno Creek (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3840012	FANNO CREEK @ DURHAM RD	95	0	0.0%

Copper

DEQ is proposing a year-around listing for copper for the upper and lower Tualatin River, Fanno Creek and Gales Creek. Table 6 summarizes the proposed listing for copper:

Table 6: Proposed Listings for Copper

Stream	River Mile	Parameter	Season/Time Period
Tualatin River (lower)	0 to 44.7	Copper	Year-around
Tualatin River (upper)	44.7 to 72.9	Copper	Year-around
Gales Creek	0 to 27.7	Copper	Year-around
Fanno Creek	0 to 13.9	Copper	Year-around

The supporting data notes that there are 7 monitoring locations in the lower Tualatin River and 5 monitoring locations in the upper Tualatin River. In all, there are more than 600 valid data points in the lower Tualatin River and nearly 250 valid data points in the upper Tualatin River. Listing based on two or more exceedances is not a practical approach when dealing with such a rich dataset. DEQ should use the 5% threshold for listing toxics as suggested above.

Table 7 shows the monitoring locations in the upper and lower Tualatin River, the number of valid samples, the total number of exceedances, the number of exceedances during the wet season, and the total percent of copper exceedances in the Tualatin River. Using the 5% threshold, none of the seven sites in the lower Tualatin River exceed the threshold. Therefore, DEQ should remove the listing of the lower Tualatin River for copper.

The upper Tualatin River does exceed the 5% threshold – primarily because of the low hardness associated with the water in the upper Tualatin Basin. An examination of the exceedances indicates that all of the

copper exceedances in the upper Tualatin River sites occurred during the wet season. There are no exceedances during the dry season in the upper Tualatin River. Therefore, DEQ should narrow the timeframe of the copper listing in the upper Tualatin River from "year around" to the wet season (November to April) to more closely reflect the timeframe when the exceedances occur.

Table 7: Total Recoverable Copper in the Tualatin River (2002-2010)

Watershed	LOCCOD	Location	Valid Samples	Total Number Exceeded	Wet Season Exceedances	Percent Exceeded	Percent Exceeded by Watershed
Lower Tualatin River	3701002	TR @ WEISS BR	97	4	4	4.1%	3.5%
	3701054	TR @ STAFFORD RD	98	3	3	3.1%	
	3701087	TR @ BOONES FERRY	98	4	4	4.1%	
	3701165	TR @ ELSNER	98	4	4	4.1%	
	3701271	TR @ SCHOLLS	97	4	3	4.1%	
	3701333	TR @ FARMINGTON	90	2	1	2.2%	
	3701391	TR @ ROOD ROAD	88	2	2	2.3%	
Upper Tualatin River	3701450	TR @ HWY 219	97	2	2	2.1%	5.3%
	3701528	TR @ GOLF COURSE RD	96	6	6	6.3%	
	3701569	TR @ FERNHILL	36	3	3	8.3%	
	3701612	TR @ SPRINGHILL	97	7	7	7.2%	
	3701715	TR @ CHERRY GROVE	92	4	4	4.3%	

The following discussion illustrates the impacts of the 303(d) listings on Clean Water Services' NPDES permit, and its facilities planning. Clean Water Services operates under a watershed-based NPDES permit that includes its four wastewater treatment facilities and the municipal stormwater program. Clean Water Services' Forest Grove and Hillsboro Wastewater Treatment Facilities (WWTFs) currently discharge to the Tualatin River during the wet season and transfer wastewater from their service area to the Rock Creek Advanced Wastewater Treatment Facility (AWTF) for treatment and discharge during the dry season. Clean Water Services has proposed to treat wastewater at the Forest Grove and Hillsboro WWTFs, direct it through a 95-acre natural treatment system at Forest Grove, and discharge treated wastewater to the Tualatin River during the dry season. Under this proposal, the Forest Grove and Hillsboro WWTFs would provide advanced secondary treatment, which would include nitrification and biological phosphorus removal, as needed, during the dry season. The effluent from the Forest Grove and Hillsboro WWTFs would then receive additional treatment at the Forest Grove natural treatment system prior to discharge to the Tualatin River. The natural treatment system is designed to reduce temperature and nutrients, provide wetland habitat and recreational benefits, and improve the overall water quality of the discharge to the Tualatin River.

The proposed year-around listing for copper in the upper Tualatin River would make it problematic to pursue year-around discharge from the Forest Grove natural treatment system – even though this project represents an enhancement of current conditions. Narrowing the listing to more closely reflect the time period when the exceedances occur would enable Clean Water Services to continue to develop the Forest Grove natural treatment system.

Tualatin River (ammonia)

DEQ is proposing to list the lower Tualatin River from river mile 0 to 44.7 on a year-around basis for ammonia.

Table 8: Proposed Listing for Ammonia

Stream	River Mile	Parameter	Season
Tualatin River	0 to 44.7	Ammonia	Year Round

A review of the data indicates that the ammonia exceedances occurred primarily during the wet season at river mile 8.5 (Boones Ferry) and river mile 5.4 (Stafford Road). The Tualatin River meets the ammonia criteria above Boones Ferry (as measured at Elsner (river mile 16.2)) and below Stafford Road (as measured at river mile 3.5)). There are no exceedances of the ammonia criteria during the dry season. At a minimum, DEQ should narrow its listing temporally and spatially – the listing should be during the wet season (November – April) from river mile 16.2 to river mile 3.5.

More importantly, it should be noted that from 2010 onwards, Clean Water Services has implemented additional operational controls at its wastewater treatment facilities to address ammonia issues in the Tualatin River during the wet season. Implementation of these operational controls has eliminated the ammonia exceedances in the lower Tualatin River. The discussion below provides additional details regarding ammonia concentrations in the Tualatin River and the actions taken by Clean Water Services.

The figures below illustrate the ammonia concentrations observed by Clean Water Services in the Tualatin River. Figure 1 provides a box plot illustrating the observed ammonia concentration by location in the river, arranged from downstream to upstream. As described in the TMDL, the wastewater discharges are the dominant source of ammonia to the Tualatin River. The observed ammonia concentrations can be explained in a large part by the seasonal operations of four wastewater treatment plants discharges in the basin.

Figure 1: Ammonia Concentration in the Tualatin River (2000-Feb. 2014)

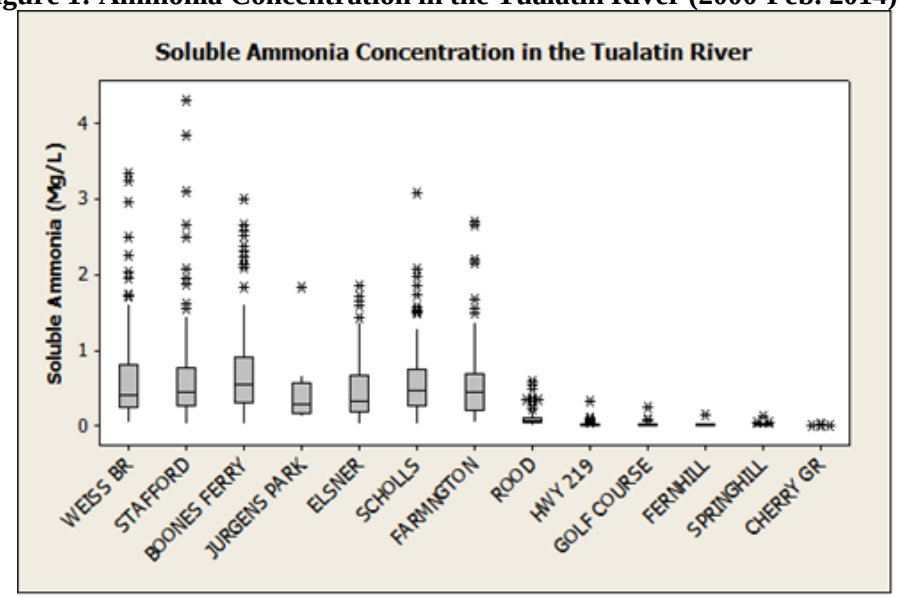


Table 9 identifies the District's WWTFs and the associated upstream location. During the summer period the Hillsboro and Forest Grove WWTFs do not discharge but rather convey the wastewater to the Rock Creek AWTF for treatment and discharge. During the summer period the Rock Creek and Durham AWTFs remove ammonia as required by permit to meet established TMDL waste load allocations. During the winter all four WWTFs discharge with varying levels of ammonia control. The Rock Creek and Durham AWTFs provide a much larger proportion of discharge compared to river flow than do the Hillsboro or Forest Grove WWTFs. Increased ambient ammonia concentrations occur below each discharge location, and are most readily apparent below Rock Creek (as measured at the Farmington Rd monitoring location).

Table 9: WWTF Location, Upstream Monitoring Site, and 90th Percentile Ammonia Concentration

Treatment Plant	Upstream River Site	90th Percentile Ammonia Conc. (mg/L)
Durham	Elsner -(Jurgens)	1.10
Rock Creek	Rood Bridge	0.22
Hillsboro	Hwy 219	0.05
Forest Grove	Fernhill	0.03

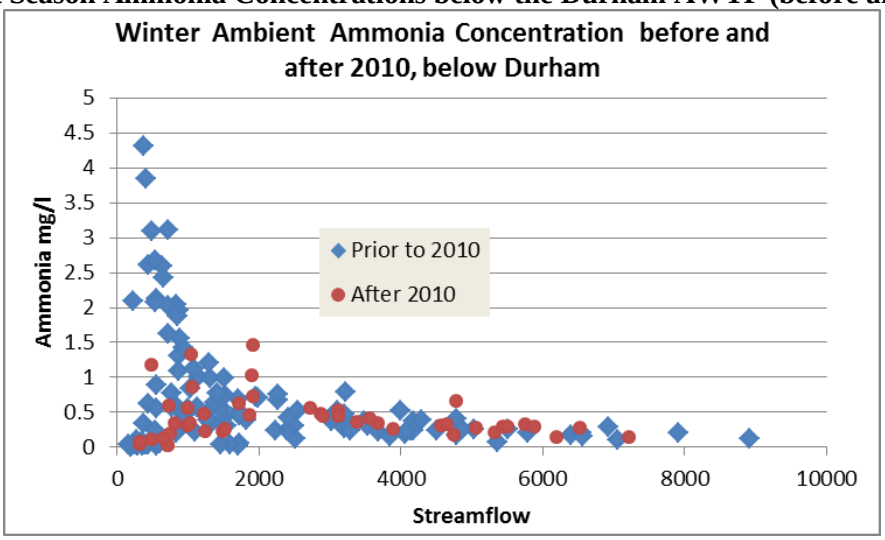
Since 2000 the District has collected over 5000 coincident samples of temperature, pH, and ammonia in the Tualatin River (Table 10).

Table 10: Number of Samples for Temperature pH, and Ammonia

Number of Samples		
Location	**2000-2009**	**2010 to present**
RM 0.2	372	125
RM 5.4	366	125
RM 8.7	373	123
RM 10.6	0	33
RM 16.5	372	91
RM 27.1	376	125
RM 33.3	208	82
RM 39.1	331	123
RM 45	354	122
RM 52.8	351	123
RM 56.9	24	46
RM 61.2	352	79
RM 71.5	282	123
Sum	3761	1320

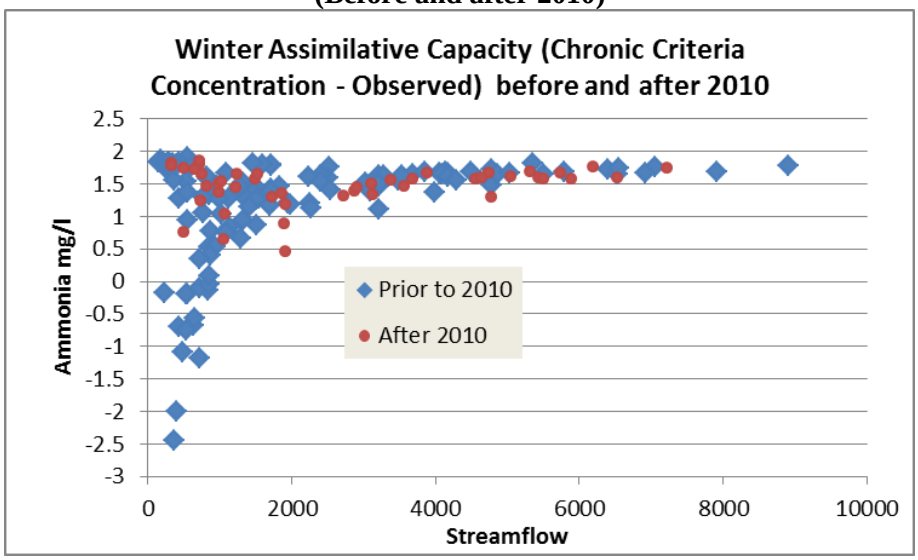
Recognizing that the ambient ammonia levels were infrequently approaching potential toxicity thresholds, Clean Water Services undertook an evaluation of the ambient data to determine the conditions that corresponded to the observed ambient ammonia concentrations. The relatively high ammonia is associated with relatively low flows during the winter when the WWTFs are not nitrifying. The site below Durham has the highest frequency and magnitude of elevated ammonia, and was used to illustrate the observations of ambient ammonia concentrations and streams flow (Figure 2). Clean Water Services initiated operational procedures in 2010 to ensure that the WWTFs either maintained nitrification during low winter flows or were brought back into a nitrification mode as winter flows dropped. As illustrated in the accompanying graph the relatively elevated ammonia concentrations are not apparent since 2010.

Figure 2: Wet Season Ammonia Concentrations below the Durham AWTF (before and after 2010)



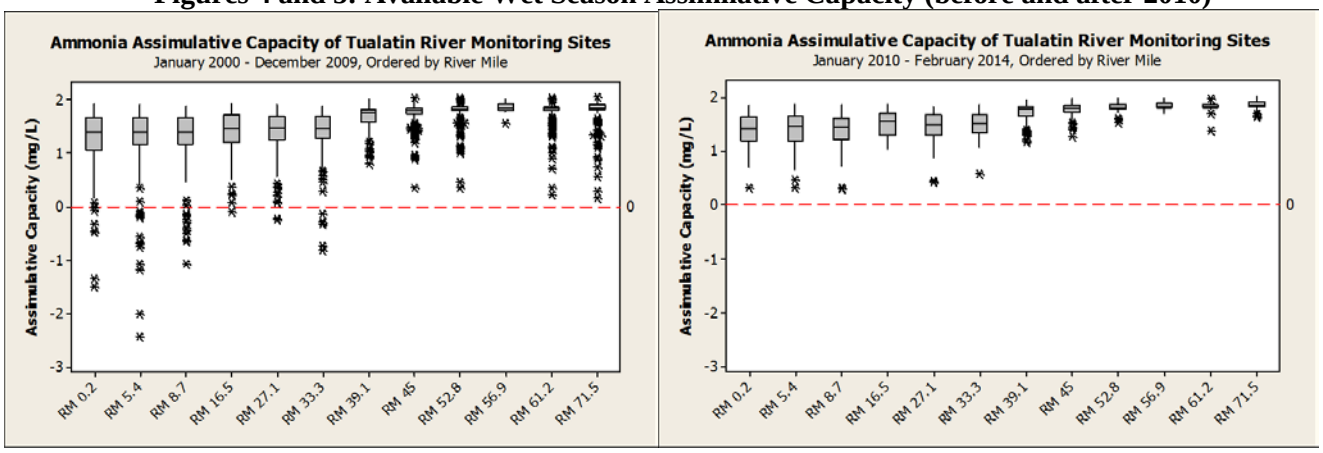
The ambient concentrations can be compared to the criteria knowing the coincident temperature and pH associated with the observed ammonia concentrations (Figure 3). The assimilative capacity was calculated as the derived chronic criteria minus the observed ammonia. When the assimilate capacity is positive, the ambient concentrations are below the standard, when negative the observed values exceed the chronic criterion concentrations. Operational changes since 2010 have been effective at ensuring ambient ammonia concentrations remain below criteria. There are no potential values exceeding criteria out of over 1300 samples.

Figure 3: Available Wet Season Assimilative Capacity below the Durham AWTF (Before and after 2010)



Similarly, the box plots in Figures 4 and 5 illustrate the available assimilative capacity at several locations on the Tualatin River. Figure 4 presents the box plots from 2000 to 2009 and Figure 5 presents the box plots from 2010 to present. While there were infrequent exceedances of the ammonia criteria prior to 2010, there have been no apparent concentrations that would exceed the calculated criteria since the operational changes have been implemented.

Figures 4 and 5: Available Wet Season Assimilative Capacity (before and after 2010)



Clean Water Services believes that the ammonia issues in the Tualatin River have already been addressed. Listing the Tualatin River on the 303(d) list as needing a TMDL for ammonia is not necessary since the operational controls have been effective at reducing ammonia concentrations below criteria. If DEQ believes it is necessary, the operational controls could be incorporated into Clean Water Services' watershed-based NPDES permit, which is in the process of being renewed.

Iron

DEQ is proposing to list a number of streams in the Tualatin Basin for iron. Table 11 summarizes the proposed listing for iron in the Tualatin Basin:

Table 11: Proposed Listing for Iron

Stream	River Mile	Parameter
Beaverton Creek*	0 to 9.8	Iron
Chicken Creek	0 to 7	Iron
Dairy Creek	0 to 10.1	Iron
Fanno Creek	0 to 13.9	Iron
Gales Creek	0 to 27.7	Iron
McFee Creek	0 to 8.3	Iron
McKay Creek	0 to 22.7	Iron
Rock Creek	0 to 18.2	Iron
Scoggins Creek	0 to 18	Iron
Tualatin River*	0 to 80.7	Iron

*Included on the 2010 303(d) list

The proposed listings for iron are based on "total" iron data. This is contrary to DEQ's stated position that iron would be implemented as a dissolved criterion (see attachment). Iron would not be a candidate for listing if the criterion is implemented as a dissolved value and using a 5% exceedance threshold (Tables 12 & 13). With the application of the criteria as a dissolved value, Clean Water Services did not pursue addressing iron in the 2012 Tualatin TMDL update believing that the listings for iron would be removed. DEQ should re-

evaluate the listings for iron. One potential approach would be to classify all iron listings as 'other' and outline a strategy for resolving the listings.

Table 12: Dissolved Iron in the Tualatin River (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3701002	TR @ WEISS BR	45	0	0.0%
3701054	TR @ STAFFORD RD	45	0	0.0%
3701087	TR @ BOONES FERRY	45	0	0.0%
3701165	TR @ ELSNER	45	0	0.0%
3701271	TR @ SCHOLLS	45	0	0.0%
3701333	TR @ FARMINGTON	45	0	0.0%
3701391	TR @ ROOD ROAD	45	0	0.0%
3701450	TR @ HWY 219	45	0	0.0%
3701528	TR @ GOLF COURSE RI	45	0	0.0%
3701569	TR @ FERNHILL	36	0	0.0%
3701612	TR @ SPRINGHILL	45	0	0.0%
3701715	TR @ CHERRY GROVE	45	0	0.0%

Table 13: Dissolved Iron in Tualatin River Tributaries (2002-2010)

LOCCOD	Location	Valid Samples	Total Number Exceeded	Percent Exceeded
3805017	SCOGGINS CREEK @ 47	43	0	0.0%
3810015	GALES CREEK @ NEW HWY 47	43	0	0.0%
3810070	GALES CREEK @ STRINGTOWN	43	0	0.0%
3811010	MCFEE CREEK @ HWY 219	23	0	0.0%
3815021	DAIRY CREEK @ HWY 8	43	1	2.3%
3815058	DAIRY CREEK @ SUSBAUER	43	1	2.3%
3816010	MCKAY CREEK @ PADGETT	31	0	0.0%
3816020	MCKAY CREEK @ HORNECKER	11	0	0.0%
3820022	ROCK CREEK @BROOKWOOD	43	0	0.0%
3821008	BEAVERTON CREEK @ GUSTON	43	0	0.0%
3821050	BEAVERTON CREEK @ 170TH	42	0	0.0%
3835020	CHICKEN CREEK @ SCHOLLS-SHERWOOD	43	2	4.7%
3835060	CHICKEN CREEK @ KRUGER RD	43	0	0.0%
3840012	FANNO CREEK @ DURHAM RD	48	0	0.0%

Mercury

DEQ is proposing to list the Tualatin River for mercury based on fish tissue data. In 2006, DEQ completed an interim TMDL for mercury for all waterbodies within the Willamette Basin. Accordingly, the 2012 303(d) list categorizes mercury in the Willamette Basin as "*category 4A- TMDL completed*". Since the Willamette Basin mercury TMDL includes all waterbodies in the basin, DEQ should re-categorize the proposed listing of the Tualatin River for mercury to "*category 4A – TMDL completed"*.

Biocriteria

Approach

DEQ is proposing to continue listing a number of streams in the Tualatin Basin for biocriteria. Table 14 presents the biocriteria listings in the Tualatin Basin.

Table 14: Proposed Listing for Biocriteria

Stream	River Mile	Parameter
Beaver Creek	0 to 5.4	Biological Criteria
Carpenter Creek	0 to 6.3	Biological Criteria
East Fork Dairy Creek	0 to 21.5	Biological Criteria
Plentywater Creek	0 to 2.1	Biological Criteria
Scoggins Creek	0 to 14	Biological Criteria
Tualatin River	0 to 80.7	Biological Criteria
Unnamed Stream	0 to 1.1	Biological Criteria
Unnamed Stream	0 to 0.9	Biological Criteria
Unnamed Stream	0 to 1.9	Biological Criteria
Unnamed Stream	0 to 2.6	Biological Criteria
Unnamed Stream	0 to 1.5	Biological Criteria
Unnamed Stream	0 to 3.9	Biological Criteria
Willow Creek	0 to 5	Biological Criteria

It is not clear how DEQ plans to address the biocriteria listings. Additionally, the implications of the biocriteria listings on the NPDES permit program are not clear. Since a TMDL cannot be developed for biocriteria, DEQ should focus its efforts to identify the underlying pollutants causing the impairment as noted in the 2010 Report.

Clean Water Services has conducted extensive macro invertebrate monitoring in the Tualatin River watershed. The 2010-11 macro invertebrate study included an assessment of stressors in the Tualatin River watershed (ABR, 2011)[1]. Temperature and dissolved oxygen were identified as the primary stressors for macro invertebrate in the Tualatin River watershed. Thus, biocriteria impairment should be addressed and resolved through listings for other pollutants as noted in 2010 Oregon's Integrated Water Quality Assessment Report. This is consistent with the approach noted in the PREDATOR model report which states that *"knowing a site is in poor biological condition is useful, but unless we are able to identify the cause(s) of impairment, we are at a loss for how to most effectively go about improving the stream."*

Oregon's 2010 Integrated Water Quality Assessment Report included listings in the Tualatin River watershed for biocriteria under the categories "water quality limited TMDL approved" and "water quality limited not needing a TMDL". These categorizations were based on the biocriteria assessment in Appendix H of the 2001 Tualatin TMDL, which stated that the impairment would be dealt through listings for other pollutants – namely, temperature, dissolved oxygen and nutrients. The 2001 Tualatin TMDL includes allocations to address impairments from temperature, dissolved oxygen, and nutrients. DEQ should re-categorize the biocriteria listings in the Tualatin Basin as "water quality limited – TMDL approved" or "water quality limited not needing a TMDL".

[1] ABR, 2010–2011 Assessment of Fish and Macroinvertebrate Communities of the Tualatin River Basin, Oregon, 2011.

Gales Creek (hexavalent chromium)
DEQ is proposing to list Gales Creek for chromium. The supporting data notes that the listing is based on two exceedances out of 56 samples. This listing is based on comparing total chromium data with hexavalent chromium criteria. Hexavalent chromium is primarily associated with metal finishing operations and not present in the natural environment without an industrial discharge. Also, DEQ did not use the currently applicable dissolved criteria – further calling into question the proposed listing of Gales Creek for chromium. If DEQ believes that chromium is a concern in Gales Creek, DEQ should focus on gathering additional information to resolve the issue. DEQ should use other assessment categories such as insufficient data or potential concern and then implement a sampling program to gather the necessary data to address the listing. A "water quality limited – TMDL needed" categorization is not the appropriate regulatory tool to determine whether the listing of Gales Creek for chromium is appropriate. DEQ should remove the listing of Gales Creek for chromium.

Fanno Creek (thallium)
DEQ is proposing to list Fanno Creek for thallium. The supporting data notes that the listing for thallium is based on two exceedances of the criteria out of a total of 178 valid samples. First, the two exceedances noted in the data set were estimated values that were below the quantitation level. Secondly, if a more reasonable approach is used for listing such as the 5% threshold noted above, there would be no basis for listing thallium. Therefore, we request that the proposed listing for thallium be deleted.

Fanno Creek (tetrachloroethylene)
DEQ is proposing to list Fanno Creek for tetrachloroethylene (PCE). USGS data collected in 2001 and 2002 is the supporting data for the proposed listing. PCE is typically associated with an industrial spill or contaminated groundwater plume (from a commercial/industrial activity) entering surface waters. The appropriate mechanism to address this issue would be through DEQ's cleanup program. Considering that the data is more than a decade old, perhaps DEQ's cleanup program has already addressed the issue - DEQ should seek confirmation that PCE is still an issue in Fanno Creek. Regardless, listing Fanno Creek on the 303(d) list for PCE is not the appropriate mechanism to address this issue.

Koll Wetland (metals)
Clean Water Services had previously commented on the listing for Koll Wetland. This waterbody is again listed in the draft 2012 Integrated Water Quality Assessment Report as being water quality limited for several metals (hexavalent chromium, copper, lead, silver and zinc). The listing is based on three months of data collected in 1992. The data used for the listing is of poor quality, and the information regarding the purpose of the monitoring and sampling procedures are lacking. The monitoring appears to be related to a remedial investigation, complaint or spill and is not part of a routine ambient monitoring program to assess water quality.

Additionally, the recent adoption of aquatic life standards based on dissolved criteria for a number of metals including chromium, lead, silver and zinc calls for a re-evaluation of the previous listings. With regards to copper, dissolved copper values were significantly higher than total copper values in 42% of the samples (5 out of 12 samples) – an indication of the poor quality of the data. The listing for hexavalent chromium was based on comparing total chromium results with hexavalent chromium criteria. As noted above, hexavalent chromium is primarily associated with metal finishing activities and it is inappropriate to compare total chromium results with hexavalent chromium criteria and list on that basis.

DEQ must take necessary steps to ensure the validity of each listing. We do not believe that the listing for Koll Wetlands is based on sound data and good judgment and request that it be deleted.

Fanno Creek (dieldrin)
Clean Water Services had also previously commented on dieldrin listing for Fanno Creek. The draft 2012 Integrated Water Quality Assessment Report notes that USGS data collected from 1993 to 2001 were used to support the listing and four out of 31 samples in the USGS data exceeded the criterion. Of the four samples that had "detectable" levels, three of the samples were detected at or near the detection limit of 0.001 µg/L; the sample results were as follows: 0.001 µg/L, 0.001 µg/L, 0.002 µg/L. The fourth sample that was used for the listing does not contain a quantifiable result – it contains a note stating that the "presence of the material was verified but was not quantified". We do not believe that these sample results provide conclusive information for listing Fanno Creek for dieldrin and we request that the listing be deleted.

Dissolved Oxygen
EPA added a number of stream segments in the Tualatin watershed to Oregon's 2010 303(d) based on the application dissolved oxygen spawning criterion for resident trout. DEQ is proposing to delist these stream segments based on information in the 2001 Tualatin TMDL (which included information regarding resident cutthroat trout spawning in the Tualatin watershed) and salmon and steelhead spawning use designations in the Oregon Administrative Rules (OAR) Chapter 340, Division 41. Clean Water Services supports DEQ's proposal to delist these stream segments based on the above-referenced information.

Thank you for the opportunity to present comments on the draft 2012 Integrated Water Quality Assessment Report. If you have any questions or would like additional information, please contact Raj Kapur at (503) 681-4424.

Sincerely,

Ken Williamson, Director
Regulatory Affairs Department
Clean Water Services

Attachment: Overview of Draft Proposed Revisions to the Arsenic, Iron and Manganese Water Quality Criteria for Human Health

Overview of Draft Proposed Revisions to the Arsenic, Iron and Manganese Water Quality Criteria for Human Health

Review of Oregon's Human Health Criteria for Manganese

As part of the Oregon Toxic Standards Review Project, the Oregon Department of Environmental Quality is reviewing its human health criteria for manganese. DEQ agreed to review the criteria because manganese is a naturally occurring earth metal in Oregon and because the "water + organism" criterion is not based on levels needed to protect human health.

The Rulemaking Workgroup supported the recommendations below at their meeting on July 13, 2009.

1) DEQ recommends that the criterion for water + fish ingestion be withdrawn.

- This criterion is not based on human health effects. Oregon does not need a numeric manganese criterion to protect water supply based on aesthetic and organoleptic effects. The Safe Drinking Water Information System database shows only 1 surface water supplier with detectable levels manganese in their finish water, and the concentration was 0.8 µg/l, far below the levels where aesthetic or taste effects are objectionable (30 – 150 µg/l). In addition, DEQ has a narrative criterion for the protection of taste, odor and aesthetic affects should limits be required to protect a surface water domestic water supply source from particularly high levels of manganese from anthropogenic sources. Finally, EPA has a secondary MCL of 50µg/l in place under the Safe Drinking Water Act to provide guidance to water suppliers for these non-health effects.

- This criterion was not based on health effects and EPA has not recommended a water + organism criterion for the protection of human health, nor have they recommended an MCL to protect against human health effects of manganese in drinking water. Manganese levels in Oregon surface waters are far below average daily human intake levels. There is no reason to believe that discharges of manganese will impact beneficial uses of Oregon's fresh waters.

2) DEQ recommends that the 100 µg/l "fish consumption only" criterion be retained for marine waters only. The 100µg/l criterion was recommended by EPA in 1976, prior to and, therefore, not based on the fish ingestion/BCF criteria derivation method published in 1980. However, it was recommended due to concerns about high bioconcentration rates among marine mollusks. A fish consumption criterion for freshwaters is not needed because BCFs for manganese in freshwater species are low (i.e., manganese does not accumulate in freshwater aquatic species in appreciable amounts).

Oregon's Current "Human Health" Criterion for Iron

Oregon's current water quality criteria for iron are 300 µg/L (0.3 mg/L) for "human health" and 1000 µg/L (1.0 mg/L) for freshwater aquatic life (chronic criterion). These were EPA's national recommended criteria at the time they were adopted, but iron is considered a non-priority pollutant by EPA. The "human health" criterion was actually based on taste and laundry staining considerations, not on human health effects. DEQ has interpreted and specified in our 2004 criteria, that the iron and manganese criteria are for dissolved metals rather than total recoverable.

DEQ agreed to review this criterion because iron is a naturally occurring earth metal that sometimes exceeds the criterion and because the criterion is not based on levels needed to protect human health.

DEQ recommends withdrawing Oregon's human health criterion for iron for the following reasons:

- The current criterion of 300 µg/L is not based on human health effects.
- Iron criteria for the protection of human health are not necessary. The tolerable intake levels are higher than those found in Oregon surface waters and much higher than the aquatic life criterion of 1000 µg/L.
- DEQ does not expect that discharges of iron in Oregon will impact beneficial uses, including the ability to drink water or consume fish.
- Oregon has a narrative criterion that allows us to protect against objectionable taste and odor if there is a need to do so.

DEQ does not propose to change the current freshwater aquatic life criterion for iron, which is 1000 µg/L. We will clarify that this criterion is for dissolved iron, as we did in 2004 and consistent with EPA's recommended criteria. Aquatic life is a designated beneficial use in all freshwater surface waters of Oregon and therefore the aquatic life criterion for iron applies to all of these waters.

Arsenic Criteria for Human Health

DEQ considered several options for deriving arsenic criteria as an alternative to EPA's current recommended criteria and discussed these options with the WQ Standards Rulemaking Workgroup. Three primary alternative approaches considered were:

1. Re-calculation of the federal criteria,
2. Use of the MCL value for drinking water in some manner, and a
3. Statewide default natural background based approach.

The table below shows possible criteria values derived under these three approach options.

Arsenic Criteria Options (µg/L inorganic arsenic)		
Approach	**Estimated Water + Organism**	**Estimated Organism Only**
OR recalculation: BCF=1, FCR=175, % inorganic=10, CSF=1.5, risk=$1x10^{-4}$	2.3	2.7
Use Org only value for both criteria	2.7	2.7
MCL hybrid (10 x 0.25)	2.5	2.5
Statewide default natural background	1-3	1-3
Current Oregon criteria (Table 20, total arsenic)	0.0022	0.0175
Current EPA recommended criteria	0.018	0.14

Notes: 1) MCL = 10 µg/L total arsenic. 2) HHC will be for inorganic arsenic.

At this time, DEQ's preferred option for the human health arsenic numeric criteria are:

1) 2.7 µg/L for the organism only criterion to protect fishing/fish consumption uses at a high fish consumption rate (175 g/d) – this is based on a calculation method using current EPA toxicity information.
2) 2.3 µg/L for the water + organism criterion to protect domestic water supply and fishing/fish consumption. This value protects human health from fish consumption based on a calculation method at the same risk level being used for all the human health criteria. This criterion represents a higher risk level, however, of 10^{-4} for the water + organism criterion. It is still significantly lower than the MCL established to protect drinking water under the SDWA.

These criteria represent an appropriate balance of human health protection and recognition that many Oregon waters contain arsenic from natural geologic sources at

levels of 1-3 µg/L or higher. These natural levels do not represent new or added health risk to the environment. Setting criteria that would trigger 303d listings, TMDLs and other CWA implementation activities would require the use of valuable public resources for administrative activities that would in most cases not result in a real reduction of arsenic levels in the water or in fish.

These proposed criteria are consistent with EPA guidance, which says that it may be appropriate use a higher risk level (up to 10^{-4}) when basing criteria on higher fish consumption rates. Because DEQ is proposing to base our criteria on a fish consumption rate of 175 grams/day and again, because of natural background levels, we conclude that 2.3 is a reasonable and protective criterion for human health in Oregon.

DEQ has agreed to supplement our numeric arsenic criteria with an arsenic reduction policy to be included in our water quality regulations. This rule will require dischargers known or likely to discharge significant amounts of anthropogenic arsenic to develop plans to reduce their arsenic load if they discharge to a stream with ambient arsenic levels below the numeric criteria d within a drinking water protection area delineated by DEQ. DEQ and the rulemaking workgroup are currently working on draft language for this policy.