Revised Willamette Basin Mercury TMDL and Water Quality Management Plan

Response to Public Comments

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DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

State of Oregon
Department of Environmental Quality

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DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

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1. Introduction

This Response to Public Comments document addresses comments and questions received regarding the Draft Revised Willamette Basin Mercury Total Maximum Daily Load (TMDL) and Water Quality Management Plan (WQMP) dated July 3, 2019. The individuals and organizations shown in Table 1 provided comments on the Draft Revised Willamette Basin Mercury TMDL/WQMP during the Public Comment Period which was held from July 3 through September 6, 2019. On August 7, 2019 a public hearing was held in Eugene, OR and in Portland, Oregon. All comments received during the public comment period have been reviewed by DEQ and addressed in this document. Comments which required modifications to the TMDL or WQMP are noted. In total there were 378 unique suggested changes from 85 submissions. DEQ made modifications to the TMDL and WQMP based on 144 of the suggested changes.

The full text of all the comments received will be available on DEQ's website.

Table 1: Commenters on the July 3, 2019 Draft Revised Willamette Basin Mercury TMDL and WQMP.

Commenter #	Last Name	First Name	Organization	Acronym
1	Wright	Steven	None Stated	W_S
2	Olson	Craig and Linda	None Stated	O_CL
3	Quintal	Tom	None Stated	Quintal_Tm
4	Olson	Craig and Linda	None Stated	O_CL
5	Olson	Craig and Linda	None Stated	O_CL
6	Fox	M. James	Cresswell Water Control District, seat 2	F_M
7	Anicker	Terrie	Northwest Mineral Prospecting Club	A_T
8	Olson	Craig	None Stated	Ol_C
9	Niewendorp	Clark	Northwest Mineral Prospecting Club	N_CN
10	Hebard	Dennis	Bohemia Mine Owners Association	H_DB
11	Becker	John	Northwest Mineral Prospecting Club	B_J
12	Secord	Dick	Bohemia Mine Owners Association	S_D
13	Webb	Tasha	Bohemia Mine Owners Association	W_TB
14	Anicker	Ron	Northwest Mineral Prospecting Club	A_R
15	Gilbert	John	Bohemia Mine Owners Association	G_J
16	Rasey	Robert	Northwest Mineral Prospecting Club	R_RN
17	Pepiot	Tom	Bohemia Mine Owners Association	P_TB
18	Atkinson	Scott	Northwest Mineral Prospecting Club	A_S
19	Quintal	Tom	None Stated	Quintal_Tm
20	Olson	Linda	None Stated	O_L
21	Dukes	McKenzie	None Stated	D_M

Commenter #	Last Name	First Name	Organization	Acronym
22	Stepnik	John	Willamette Valley Miners	S_J
23	Connor	Howard	Willamette Valley Miners	C_H
24	Greenlee	Cheryl	None Stated	G_C
25	Commenters	Various	None Stated	Cm_V
26	Roberts	Stephen	Washington County Department of Land Use & Transportation	R_S
27	Pepiot	Tom	President of the Bohemia Mine Owners Association	P_TP
28	Hays	Jeff	None Stated	h_
29	Stocking	Richard	None Stated	St_R
30	Karnosh	Michael	The Confederated Tribes of the Grand Ronde Community of Oregon	K_M
31	NA	Jamie	None Stated	NA
32	Knoll	Charles R.	Linn County Road Department	K_C
33	Nicholas	Brian	Marion County Public Works	N_B
34	Jordan	Michael	Bureau of Environmental Services, City of Portland	J_M
35	Warren	Jeff	None Stated	W_J
36	O'Brien	Dan	Greenberry Irrigation District	OB
37	Smeltzer	Odessa	None Stated	S_O
38	Quintal	Tom	Willamette Valley Miners Association	Q_TW
39	Webb	Tasha Lee	None Stated	W_TL
40	Stockhoff	Gary	Benton County	S_G
41	James	Jim	Oregon Small Woodlands Association	J_JO
42	Walch	Therese	City of Eugene	W_TC
43	Rowe	Blake	Oregon Wheat Growers League	R_B
44	Secord	Richard and Laura	None Stated	S_RL
45	Eliason	Michael	Association of Oregon Counties	E_
46	Kirsch	Paul	G.A. Miller Drainage District	K_P
47	Niewendorp	Clark	None Stated	Nw_C
48	Baumgartner	Robert P.	Clean Water Services	B_RP
49	Christensen	Vivian	None Stated	Ch_V
50	Sweeney	Sam	None Stated	Sw_S
51	Bielenberg	Dave	East Valley Water District	B_D
52	Carlin	Jayne	EPA	C_J

Commenter #	Last Name	First Name	Organization	Acronym
53	Mulder	Sidney	Polk County	M_SP
54	Abraham	Kyle	Oregon Department of Forestry	A_K
55	Geist	Greg	Clackamas County and Water Environment Services	G_G
56	Folliard	Lee	Oregon/Washington Bureau of Land Management	F_L
57	Darnell	Karen	StreamSavers	D_K
58	Nagely	Meredith	Associated Oregon Hazelnut Industries	N_M
59	Smith	Susan	Oregon Association of Clean Water Agencies (ACWA)	S_SO
60	Dillon	Dave	Oregon Farm Bureau, Oregon Forest & Industries Council, Oregon Association of Nurseries	D_D
61	Russell	Mike	Columbia County	R_MCC
62	Rubin	Jared	Eugene Water & Electric Board	R_JE
63	Fast	Katie	Oregonians for Food & Shelter (OFS), Oregon Cattlemen's Association	F_K
64	Powers	Mike	Oregon Department of Agriculture	P_M
65	Handaly	Keri Morin	City of Gresham	H_K
66	Hebard	Dennis	None Stated	Hb_D
67	Hack	Jodi	Oregon Home Builders Association	H_J
68	Mabe	David	Bureau of Reclamation, Pacific Northwest Region	M_D
69	Hebard	Dennis	None Stated	Hb_D
70	Machinski	Penny	Portland General Electric Company.	M_P
71	Jones	Jenna	League of Oregon Cities	J_JL
72	Metz	Eric D.	Oregon Department of State Lands	M_E
73	Simpkins	Sunny	Multnomah County Drainage District	S_SM
74	Bellringer	Holly	U.S. Army Corps of Engineers Portland District, Water Quality Section	B_H
75	Moffett	Sharla	Oregon Business & Industry	M_SO
76	Rolfe	Mike	Creswell Water Control District	R_MCW
77	Snell	April	Oregon Water Resources Congress (OWRC) and the Oregon Farm Bureau (OFB)	S_A
78	VanNatta	Kathryn	Northwest Pulp and Paper Association	VN
79	Stevenson	Brent	Santiam Water Control District	S_B

Commenter #	Last Name	First Name	Organization	Acronym
80	Williams	Travis	Willamette Riverkeeper	W_TW
81	Beyer	Roger	Oregon Seed Council	B_RO
82	Rose	Richard Herrington	None Stated	R_RH
83	Boshart	Stan	SJB Farms	B_S
84	Hubbard	Tom	City of Corvallis Public Works	H_T
85	Rosa	Jerome	None Stated	Rs_J

2. Comments from: Wright, Steven

W_S#1: Suggested Change ID #7

Description: WLA - 700PM - suction mining removes mercury and no studies show a rise of mercury in fish after dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining can remove mercury from streams and there is no data showing a rise in mercury in fish after dredging has occurred.

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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3. Comments from: Olson, Craig and Linda

O_CL#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_CL#2: Suggested Change ID #3

Description: WLA - 700PM - dredged holes in streams capture mercury

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because dredged holes capture mercury as they are filled in by suspended sediment and small cobbles

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and capture have not been quantified. DEQ is not aware of any studies demonstrating capture of mercury by dredged holes. However, once mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. But, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. Therefore, capture of dissolved and methylated mercury into holes filling with sediment and cobbles is unlikely. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_CL#3: Suggested Change ID #4

Description: WLA - 700PM - presence of mercury in streams not proven and suction miners don't use mercury to recover gold

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because DEQ hasn't proven there is measurable mercury in the streams and suction miners do not use mercury to recover gold

Response: As noted in the TMDL, mercury was measured in stream sediment in Brice Creek, Champion Creek, Sharps Creek and the Row River ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). In contrast, the same study found that sediment in streams above the Bohemia Mining District areas average 0.07 mg/kg of mercury. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_CL#4: Suggested Change ID #5

Description: WLA - 700PM - density of mercury settles it out before other metals and studies show turbidity from suction dredging dissipates with 80-160m

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because a 1997 study showed water clarity returning to upstream levels within 80-160m downstream of a dredge and mercury is more dense than copper and zinc so it should settle out sooner

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and settling of the many forms of mercury that could be present have not been quantified. DEQ agrees that the density of elemental mercury may assist in it settling out sooner than other metals. Once elemental mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. However, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_CL#5: Suggested Change ID #6

Description: WLA - 700PM - Nat'l Academy report concluded mercury risk from fish consumption is low for most people

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2000 US National Academy of Sciences report concluded that the risk of harm from eating mercury contaminated fish was low for the majority of people.

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state.

O_CL#6: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_CL#7: Suggested Change ID #9

Description: WLA - 700PM - WA and CA support mercury removal via suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Washington's Department of Ecology hazardous waste and toxics reduction program (2007 press release), EPA and California's Division of Toxic Substance Control program (2000) support suction dredging as an effective method for removing elemental mercury before it can be converted by bacteria to methyl mercury

Response: As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining." A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was

associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_CL#8: Suggested Change ID #10

Description: WLA - 700PM - mercury is washed out to sea and naturally cycles between forms

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because elemental mercury is washed out to sea where bacteria convert it to methylmercury and plants and other organisms convert it back to inorganic forms which is a constant cycle for eons

Response: DEQ agrees that mercury cycling within the environment occurs through many complex and interrelated processes. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_CL#9: Suggested Change ID #11

Description: WLA - 700PM - ocean fish methylmercury type is less toxic than the form fish consumption advisory is based on and may be moderated by selenium

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because methyl mercury cysteine is found in seafood and may be less toxic than the mercury form fish consumption advisories are based on and may be moderated by high selenium content in ocean fish and eating seafood is healthy

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state. One purpose of the TMDL is to be protective of freshwater fish species within the Willamette Basin, not be protective of ocean/saltwater fish. While there are studies of selenium content in ocean fish and western US stream fish potentially having a moderating effect on mercury in fish tissue, selenium levels in the Willamette Basin streams are not very high and there is not evidence to suggest that the selenium is offsetting the toxicity of methylmercury within the basin. DEQ's TMDL does not affect Oregon Health Authority's fish consumption advisories. Rather, the TMDL is

proposed to help reduce mercury in fish tissue over time, with the eventual goal of allowing all beneficial uses, including unrestricted fish consumption.

O_CL#10: Suggested Change ID #12

Description: WLA - 700PM - miners are not required to comply with state statutes or regulations on US Forest lands that interfere with mining

Comment: Miners are not required to comply with state statutes or regulations on US Forest Service land when the regulations interfere with mining

Response: There is technical evidence in the record of the environmental impacts of suction dredge mining supporting the need for regulation. Additionally regulation of suction dredge mining was recently affirmed by the Oregon Supreme Court in Eastern Oregon Mining Association v. DEQ, 365 Or. 313 (2019).

O_CL#11: Suggested Change ID #13

Description: WLA - 700PM - mining claimants have the preferential right to extract minerals within the claim

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mining claimants have the preferential right to extract minerals within the claim

Response: DEQ does not dispute mining claimants rights to extract minerals within a claim. DEQ regulates point source discharges by suction dredges under the NPDES 700PM permit. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_CL#12: Suggested Change ID #14

Description: WLA - 700PM - suction mining areas limited in state because of impacts to fish habitat, but suction dredging improves fish habitat

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining has been banned throughout the state without evidence of environmental damage to fish bearing streams although dredging can be used to address fish disease and improve habitat

Response: One purpose of the TMDL is to reduce mercury in streams and fish tissue. Structural fish habitat concerns are not within the scope of the TMDL.

O_CL#13: Suggested Change ID #15

Description: WLA - 700PM - eliminate 700PM and pay miners to remove mercury from streams

Comment: The state should eliminate the 700PM permit and pay miners to suction dredge all mercury from Willamette Basin streams

Response: The 700PM permit is scheduled for renewal, at which time comments on the permit will be solicited. Because the 700PM is currently in place, DEQ must evaluate potential impacts to mercury and methylmercury in Willamette Basin streams due to permitted activities and propose reductions, as warranted.

O_CL#15: Suggested Change ID #378

Description: WLA - 700PM - Do not condone contamination of the waterways in the Applegate River Spawning Gravel Restoration Project

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ condones contamination of the waterways in the Applegate River Spawning Gravel Restoration Project

Response: This comment is out of the scope for the Willamette Basin Mercury TMDL.

O_CL#20: Suggested Change ID #27

Description: WLA - 700PM - TMDL proposes leaving mercury in streams rather than allowing impacts during suction mining which removes mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ staff are idiots or have an anti-mining agenda to propose leaving 100% of mercury and lead in streams rather than risk reintroduction of 2% during removal of 98% with free suction dredging.

Response: DEQ clarifies that the study referenced in the TMDL as Humphreys 2005 found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of

existing mercury contamination in stream sediments. As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining."

O_CL#21: Suggested Change ID #28

Description: WLA - 700PM - the US spends billions removing lead, allows fishing licensees to throw lead into streams and suction mining that removes lead is banned

Comment: US spent billions of dollars removing lead from everything, but annually issues we issue millions of fishing licenses that allow people to throw lead into the water and bans suction mining by the only people capable of removing the lead.

Response: This comment regarding the economics, disposition and removal of lead from streams is out of scope for the Willamette Basin Mercury TMDL.

O_CL#22: Suggested Change ID #29

Description: WLA - 700PM - Flu vaccine contains more mercury than allowable levels in drinking water

Comment: NA

Response: DEQ's TMDL for reducing mercury in Willamette Basin streams is not related to levels of mercury in Flu vaccines or drinking water.

O_CL#23: Suggested Change ID #30

Description: Reasonable Assurance - Timing - Include a timeframe for how long it will take to reduce mercury in fish

Comment: How long will it take to reduce mercury in our fish? DEQ does not have a complete understanding of the sources of mercury in fish, so can't determine how long mercury will remain at present levels.

Response: This is a topic that DEQ will gather information on through the Monitoring and Assessment strategy. Through the adaptive management process, DEQ will continue to address achievement of the methylmercury criteria. Information gathered through the Monitoring and Assessment Strategy will help DEQ become more specific about the timeframe for achievement of the standard.

O_CL#24: Suggested Change ID #31

Description: WLA - 700PM - many waterbodies have fish consumption advisories

Comment: Remove prohibitions on suction dredge mining in tributaries to Dorena Reservoir because, according to EPA's Fish Consumption Advisories website, many waterbodies across the country, including ocean waters, have fish and shellfish with elevated mercury levels.

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state.

O_CL#25: Suggested Change ID #32

Description: WQMP - Include information on disposal of consumer products that contain mercury

Comment: Include information on disposal of consumer products that contain mercury - Although mercury may come from natural sources, it is also found in a number of consumer products, such as fluorescent light bulbs, some imported skin-lightening and anti-aging creams, vehicle light switches, certain types of button cell batteries, thermostats and thermometers. You should not dispose of these products down the sink, on the ground, down a storm drain or in your garbage can. How are they to be disposed of?

Response: Section 13.3.3.2 of the draft TMDL and Water Quality Management Plan includes information about household hazardous waste collection events specific to mercury-containing consumer products and provides links to DEQ's website for additional resources.

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4. Comments from: Quintal, Tom

Quintal_Tm#1: Suggested Change ID #1

Description: TMDL Authority - TMDL issued as an order

Comment: Issue TMDL as administrative rule rather than as an order

Response: Oregon Administrative Rule 340-042-0060 titled Issuing a Total Maximum Daily Load states "(1) The Director will issue a TMDL as an order."

Quintal_Tm#2: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Quintal_Tm#3: Suggested Change ID #16

Description: Modeling - unspecified concerns with FORTRAN

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because miners and some industries affected by the TMDL have serious concerns with the watershed model, which uses the Hydrological Simulation Program - FORTRAN to simulate movement of mercury via flow and sediment routing.

Response: HSPF is a comprehensive watershed model recommended by EPA for the development of TMDLs. HSPF has been used to develop many TMDLs including those for sediment and sediment bound chemicals throughout the US. DEQ considers HSPF an appropriate tool for use in the development of TMDLs. Since there are no specific questions raised in the comment about the simulation of erosion and sediment, DEQ can only respond in this general manner.

Quintal_Tm#4: Suggested Change ID #17

Description: WLA - 700PM - scientists trespassed on mining claims to conduct studies referenced in the TMDL

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because those who conducted some of the studies DEQ relies on committed mineral trespass when stream sampling was undertaken.

Response: This comment is outside the scope of DEQ's authority. DEQ does not have the authority to determine whether or not mineral trespass was committed. The determination as to whether or not mineral trespass occurred would not change the utility of the studies for determining the presence of mercury in the subject streams, which is the basis for DEQ's prohibition of suction mining, since multiple other studies show the potential for existing mercury to be disturbed, mobilized and methylated in the reservoir

downstream and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury.

Quintal_Tm#5: Suggested Change ID #18

Description: WLA - 700PM - dredging only allowed for a few weeks per year with turbidity limits so mercury impacts are low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because due to ODFW in water work windows, miners can only work in streams for a few weeks a year when water and sediment flows are low and can only make turbidity for 300 feet, so suction dredges causing mercury in streams is not a big issue.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Quintal_Tm#6: Suggested Change ID #19

Description: WLA - 700PM - mining claimants will require financial reimbursement

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mining claimants require financial reimbursement for loss of Federal Mining Mineral Estate personal property because hand operated mining will not allow demonstration of a reasonable prospect of making a profit in order to retain a valid BLM claim.

Response: Your comment is in regards to financial impacts to mining claims as a result of the TMDL. Section 303(d) of the Clean Water Act (CWA) requires States to develop TMDLs to reduce pollutant loading to waters of the state in order to attain and maintain water quality standards and support identified beneficial uses for those waters. The prohibition on suction dredging in specific waters is intended to limit the mobilization of sediment, mercury and methylmercury in those waters. It is DEQ's determination that this is required to make necessary progress toward meeting the water quality standard and that this regulation does not require financial reimbursement to mining claimants.

Quintal_Tm#7: Suggested Change ID #20

Description: WLA - 700PM - Sharps Creek and other tributaries to Dorena Reservoir should not be 303(d) listed

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Sharps Creek is a secondary transport pathway for mercury and should not be 303(d) listed.

Response: DEQ is not currently proposing to add Sharps Creek or other tributaries to Dorena Reservoir to the 303(d) list of waterbodies impaired by mercury. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Sediment analyzed from Sharps Creek was found to have a mean concentration of 0.20 mg/kg mercury (Hygelund et al 2001). Because Sharps Creek is tributary to Dorena Reservoir and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Quintal_Tm#8: Suggested Change ID #21

Description: WLA - 700PM - suction mining is not the source of mercury and mercury contribution from suction mining is low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ's studies show mining is only 1% of the mercury load for the Willamette Basin, so mining is not a mercury issue. This TMDL proposal unfairly burdens suction dredge miners as point-source polluters when they are not the source of the mercury. Abandoned mines on federal land are responsible.

Response: DEQ clarifies that the TMDL modeling indicates that all permitted wastewater point source discharges contribute approximately one percent of the mercury load within the Willamette Basin. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. Finally, DEQ's TMDL also requires reduction of mercury by 95% from legacy mine-related sources, with the federal agencies as designated management agencies responsible for implementation.

Quintal_Tm#9: Suggested Change ID #22

Description: WLA - 700PM - no 303(d) listings in Bohemia streams because suction dredging is the only way to remove mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ should not 303(d) list the streams in the Bohemia Mining District because suction mining is the only way to remove mercury from this environment. No one else will remove mercury from streams and it will eventually migrate down to where it will be converted into methylmercury.

Response: DEQ clarifies that streams in the Bohemia Mining District are not currently proposed for inclusion on the 303(d) list of waters impaired by mercury. DEQ agrees that miners sometimes find and remove elemental mercury during suction dredge mining and that mercury currently in tributaries to Dorena Reservoir could migrate downstream to areas where methylation can occur. As noted in section 9.2.3 of the draft TMDL, the streams and upland areas within the Bohemia Mining District that are known to be contaminated with mercury due to historical mining activities are on the list of Abandoned Mine Lands sites being tracked, investigated and remediated by state and federal agencies. In the meantime, the TMDL prohibits suction dredge mining within mercury contaminated tributaries to Dorena Reservoir because the studies referenced in the TMDL show that suction dredge mining can uncover, transform, transport and increase methylation potential of mercury in stream sediment and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury.

Quintal_Tm#10: Suggested Change ID #23

Description: WLA - 700PM - density of mercury settles it out within 300 ft turbidity permit limit so no significant harm

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because elemental mercury is heavy and dense and would not travel beyond the 300 foot plume limit in the 700PM before settling, so does not cause significant harm to streams.

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and settling of the many forms of mercury that could be present have not been quantified. DEQ agrees that the density of elemental mercury may assist in it settling out within the 300 feet allowable for visible turbidity under the 700-PM permit. Once elemental mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. However, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent

methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

Quintal_Tm#11: Suggested Change ID #24

Description: WLA - 700PM - NPS mercury contributions much greater than suction mining contributions

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because dredges contribute significantly less mercury than nonpoint sources so DEQ should not discriminate against dredges as tools to remove mercury from streams with no cost.

Response: DEQ agrees that the TMDL modeling indicates that nonpoint and background sources contribute more than 94% of the mercury load within the Willamette Basin, while all permitted wastewater point source discharges contribute approximately one percent. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Quintal_Tm#12: Suggested Change ID #25

Description: WLA - 700PM - no studies show suspension of floured mercury for miles downstream

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I have not found studies that show floured mercury stays suspended for miles below dredging sites.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including "floured"), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Quintal_Tm#13: Suggested Change ID #26

Description: WLA - 700PM - oxygenation by suction dredging prevents methylation

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mercury methylation happens under anaerobic conditions not found in running streams and suction dredging adds even more oxygenation preventing conversion by bacteria of elemental mercury to methylmercury.

Response: DEQ agrees that mercury cycling within the environment occurs through many complex and interrelated processes. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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5. Comments from: Fox, M. James of Cresswell Water Control District, seat 2

F_M#1: Suggested Change ID #33

Description: WQMP - Responsible persons - Remove or add entity to the TMDL as a responsible person

Comment: Remove or add entity to the TMDL as a responsible person

Response: The Creswell Water Control District has jurisdiction to operate water flow from a drainage system that discharges to the Coast Fork Willamette River, a major tributary to the Willamette River.

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6. Comments from: Anicker, Terrie of Northwest Mineral Prospecting Club

A_T#1: Suggested Change ID #34

Description: General - Are TMDL authors OR licensed engineering geologists or civil engineers?

Comment: NA

Response: DEQ's Willamette Basin Mercury TMDL was written by a team of DEQ staff, in coordination with EPA and EPA's contractor Tetra Tech. None of the DEQ team are registered professional geologists or environmental/civil engineers. The TMDL Technical Support Document was authored by Tetra Tech. The Tetra Tech team was led by a nationally recognized expert and registered Professional Hydrologist with 32+ years of experience in watershed planning, risk assessment, water quality management, and development and application of hydrologic and water quality models.

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7. Comments from: Olson, Craig

Ol_C#1: Suggested Change ID #9

Description: WLA - 700PM - WA and CA support mercury removal via suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Washington's Department of Ecology hazardous waste and toxics reduction program (2007 press release), EPA and California's Division of Toxic Substance Control program (2000) support suction dredging as an effective method for removing elemental mercury before it can be converted by bacteria to methyl mercury

Response: As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining." A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in

tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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8. Comments from: Niewendorp, Clark of Northwest Mineral Prospecting Club

N_CN#1: Suggested Change ID #35

Description: General - Data from 3 sources show that background mercury levels will never meet DEQ's target in the Bohemia Mining District

Comment: Set a higher mercury target

Response: The analysis in the TMDL report demonstrates that mercury target concentrations in fish tissue can be achieved. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

N_CN#2: Suggested Change ID #36

Description: Source Assessment - NPS - When the Corps allows water levels in Dorena Reservoir to go up and down, mercury is methylated season after season

Comment: NA

Response: The US Army Corps of Engineers is named in the TMDL as a designated management agency and must develop an implementation plan to reduce mercury inputs and methylation at each of the reservoirs they manage within the Willamette Basin, including Dorena.

N_CN#3: Suggested Change ID #37

Description: General - provide all data on DEQ's website

Comment: NA

Response: All of the data considered during development of the TMDL is provided in the TMDL documents, including the Appendices, which include the TMDL Technical Support Document, prepared by Tetra Tech on EPA's behalf. These documents are all currently available on DEQ's website. All datasets with associated metadata used in the development of the TMDL will be made available on DEQ's website after issuance of TMDL.

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9. Comments from: Hebard, Dennis of Bohemia Mine Owners Association

H_DB#1: Suggested Change ID #38

Description: WLA - 700PM - HgS cinnabar makes up 64% of Champion Mine stream sediment and is not a source of dissolved Hg2 in streams

Comment: Do not prohibit suction dredge mining in Champion Creek because mercury in sediment there is from natural sources.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of Champion Creek (which is tributary to Dorena Reservoir) ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

H_DB#2: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including "floured"), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and

Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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10. Comments from: Becker, John of Northwest Mineral Prospecting Club

B_J#1: Suggested Change ID #7

Description: WLA - 700PM - suction mining removes mercury and no studies show a rise of mercury in fish after dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining can remove mercury from streams and there is no data showing a rise in mercury in fish after dredging has occurred.

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

B_J#2: Suggested Change ID #40

Description: WLA - 700PM - DEQ has not considered the Joe Greene and Claudia Wise dredging study

Comment: NA

Response: DEQ searched for peer reviewed, published studies by Joe Greene and Claudia Wise and could not find any. DEQ did find a PowerPoint by Greene and Wise as well as testimony by the pair on

permit actions in Washington. However, the studies referenced were the same ones as those in DEQ's TMDL, and no additional information refuting DEQ's interpretation of those studies was offered. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

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11. Comments from: Secord, Dick of Bohemia Mine Owners Association

S_D#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

S_D#2: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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12. Comments from: Webb, Tasha of Bohemia Mine Owners Association

W_TB#1: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

W_TB#2: Suggested Change ID #41

Description: General - comment period too short

Comment: NA

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe required in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

W_TB#3: Suggested Change ID #44

Description: General - DEQ did not include miners in the decision making process

Comment: NA

Response: DEQ does not agree that miners did not have opportunity to participate in the TMDL process. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. A 25-member Advisory Committee was established with representation by stakeholders from both point sources and nonpoint sources that met 2 years and for which all meetings were publicized and open to the public. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. All affected parties were also invited to review materials, contact DEQ staff with questions and provide comments at a public hearing, held at two locations spanning the Willamette Basin, and throughout a 66 day public comment period.

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13. Comments from: Anicker, Ron of Northwest Mineral Prospecting Club

A_R#1: Suggested Change ID #42

Description: Reasonable Assurance - DEQ has little mercury data in tributaries to Dorena Reservoir, so no baseline to evaluate effectiveness of prohibiting suction mining there

Comment: NA

Response: DEQ is developing an assessment and monitoring strategy, in collaboration with EPA, to evaluate overall effectiveness of TMDL implementation and in-stream responses.

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14. Comments from: Gilbert, John of Bohemia Mine Owners Association

G_J#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

G_J#2: Suggested Change ID #18

Description: WLA - 700PM - dredging only allowed for a few weeks per year with turbidity limits so mercury impacts are low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because due to ODFW in water work windows, miners can only work in streams for a few weeks a year when water and sediment flows are low and can only make turbidity for 300 feet, so suction dredges causing mercury in streams is not a big issue.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

G_J#3: Suggested Change ID #42

Description: Reasonable Assurance - DEQ has little mercury data in tributaries to Dorena Reservoir, so no baseline to evaluate effectiveness of prohibiting suction mining there

Comment: NA

Response: DEQ is developing an assessment and monitoring strategy, in collaboration with EPA, to evaluate overall effectiveness of TMDL implementation and in-stream responses.

G_J#4: Suggested Change ID #43

Description: WLA - 700PM - studies are biased due to funding by environmental groups

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because these restrictions are unfounded and based on biased studies funded by environmental groups.

Response: In evaluating the potential for mercury in stream sediment to be transformed, mobilized and methylated, DEQ relied on all available studies published in peer-reviewed literature.

G_J#5: Suggested Change ID #44

Description: General - DEQ did not include miners in the decision making process

Comment: NA

Response: DEQ does not agree that miners did not have opportunity to participate in the TMDL process. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. A 25-member Advisory Committee was established with representation by stakeholders from both point sources and nonpoint sources that met 2 years and for which all meetings were publicized and open to the public. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. All affected parties were also invited to review materials, contact DEQ staff with questions and provide comments at a public hearing, held at two locations spanning the Willamette Basin, and throughout a 66 day public comment period.

G_J#6: Suggested Change ID #45

Description: Loading Capacity - an 88% reduction from 361 g/day to 42 g/day is unrealistic

Comment: NA

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to

reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

G_J#7: Suggested Change ID #46

Description: WLA - 700PM - different regulation of water by the Corps of Engineers could solve the mercury problem

Comment: Do not prohibit suction dredge mining in the tributaries to Dorena Reservoir because different regulation of water by the Corps of Engineers could solve the mercury problem

Response: The US Army Corps of Engineers is named in the TMDL as a designated management agency and must develop an implementation plan to reduce mercury inputs and methylation at each of the reservoirs they manage within the Willamette Basin, including Dorena.

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15. Comments from: Rasey, Robert of Northwest Mineral Prospecting Club

R_RN#1: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including “floured”), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ’s TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

R_RN#2: Suggested Change ID #47

Description: Source Assessment - Dorena Reservoir watershed - where and when were samples taken?

Comment: NA

Response: The sources and timing of data used in development of the TMDL is explained in Section 2.0 of the TMDL Technical Support Document, available on DEQ's website. The data themselves characterize observed mercury concentrations in the water column, fish tissue, and sediment. Based on available records, mercury monitoring in the Willamette River Basin dates to 1969, however, the TMDL applies more recent data collected between 2002 to 2017. Figure 2-2 in the Technical Support Document shows the temporal distribution of mercury sampling in the basin whereas Figure 2-1 shows the spatial distribution of mercury sampling at the HUC8 catchment scale. Monitoring data informed modeling efforts that were employed to estimate existing mercury loads from various point and nonpoint sources throughout the basin, as explained in Sections 1.2, 3.0, 4.0 and 5.0 of the TMDL Technical Support Document. Specific evaluations on the Dorena Reservoir are explained in Section 5.3.4 of the TMDL Technical Support Document. In addition, DEQ referenced studies conducted in multiple tributaries to Dorena Reservoir, as detailed in Sections 9.4.1.2 and 13.2.1.1.2 of the TMDL and Water Quality Management Plan.

R_RN#3: Suggested Change ID #48

Description: Data sources - how was mercury content in fish tissue samples determined?

Comment: NA

Response: Mercury fish tissue samples applied in the TMDL were collected through multiple studies facilitated by various agencies (Oregon DEQ, US Environmental Protection Agency, United States Geological Survey). Information about the fish tissue data sources is discussed in the Technical Support Document (Section 2.0 – Data Sources). All mercury fish tissue data applied in the technical assessments and TMDL were collected in the Willamette River Basin. Fish tissue data applied in the TMDL included multiple fish species (Northern Pikeminnow, Largemouth Bass, Bluegill, etc.) and both juvenile and adult fish, however, mercury tissue samples from non-fish aquatic species (e.g., mollusks) were excluded. Only wet weight analyses of fish fillets and composite samples were included. Fish liver and whole body mercury samples, for example, were excluded from use in the food web model.

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16. Comments from: Pepiot, Tom of Bohemia Mine Owners Association

P_TB#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

P_TB#2: Suggested Change ID #4

Description: WLA - 700PM - presence of mercury in streams not proven and suction miners don't use mercury to recover gold

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because DEQ hasn't proven there is measurable mercury in the streams and suction miners do not use mercury to recover gold

Response: As noted in the TMDL, mercury was measured in stream sediment in Brice Creek, Champion Creek, Sharps Creek and the Row River ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). In contrast, the same study found that sediment in streams above the Bohemia Mining District areas average 0.07 mg/kg of mercury. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

P_TB#3: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TB#4: Suggested Change ID #17

Description: WLA - 700PM - scientists trespassed on mining claims to conduct studies referenced in the TMDL

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because those who conducted some of the studies DEQ relies on committed mineral trespass when stream sampling was undertaken.

Response: This comment is outside the scope of DEQ's authority. DEQ does not have the authority to determine whether or not mineral trespass was committed. The determination as to whether or not mineral trespass occurred would not change the utility of the studies for determining the presence of mercury in the subject streams, which is the basis for DEQ's prohibition of suction mining, since multiple other studies show the potential for existing mercury to be disturbed, mobilized and methylated in the reservoir downstream and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury.

P_TB#5: Suggested Change ID #18

Description: WLA - 700PM - dredging only allowed for a few weeks per year with turbidity limits so mercury impacts are low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because due to ODFW in water work windows, miners can only work in streams for a few weeks a year when water and sediment flows are low and can only make turbidity for 300 feet, so suction dredges causing mercury in streams is not a big issue.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TB#6: Suggested Change ID #19

Description: WLA - 700PM - mining claimants will require financial reimbursement

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mining claimants require financial reimbursement for loss of Federal Mining Mineral Estate personal property because hand operated mining will not allow demonstration of a reasonable prospect of making a profit in order to retain a valid BLM claim.

Response: Your comment is in regards to financial impacts to mining claims as a result of the TMDL. Section 303(d) of the Clean Water Act (CWA) requires States to develop TMDLs to reduce pollutant loading to waters of the state in order to attain and maintain water quality standards and support identified beneficial uses for those waters. The prohibition on suction dredging in specific waters is intended to limit the mobilization of sediment, mercury and methylmercury in those waters. It is DEQ's determination that this is required to make necessary progress toward meeting the water quality standard and that this regulation does not require financial reimbursement to mining claimants.

P_TB#7: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including "floured"), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TB#8: Suggested Change ID #49

Description: General - DEQ did not include miners in the TMDL Advisory Committee

Comment: NA

Response: The Willamette Basin drains approximately 12% of the state of Oregon or 11,460 square miles, includes 12,760 miles of streams and supports 70% of Oregon's population. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL, including establishing an Advisory Committee with 25 non-DEQ members that committed to participate for 2 years to provide input on source identification, allocations and prioritization for implementation. Advisory Committee members were selected in consideration of the 2006 TMDL, which identified nonpoint source land uses as the largest mercury source reductions needed. Included in the Advisory Committee was a representative from the Oregon Department of Geology and Mineral Industries. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. While DEQ believes the right proportional participation balance was struck on the large Advisory Committee, DEQ will consider inviting a representative of the suction dredge mining community to participate in future Willamette Basin Advisory Committee opportunities where relevant.

17. Comments from: Atkinson, Scott of Northwest Mineral Prospecting Club

A_S#1: Suggested Change ID #9

Description: WLA - 700PM - WA and CA support mercury removal via suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Washington's Department of Ecology hazardous waste and toxics reduction program (2007 press release), EPA and California's Division of Toxic Substance Control program (2000) support suction dredging as an effective method for removing elemental mercury before it can be converted by bacteria to methyl mercury

Response: As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining." A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury

from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

A_S#2: Suggested Change ID #11

Description: WLA - 700PM - ocean fish methylmercury type is less toxic than the form fish consumption advisory is based on and may be moderated by selenium

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because methyl mercury cysteine is found in seafood and may be less toxic than the mercury form fish consumption advisories are based on and may be moderated by high selenium content in ocean fish and eating seafood is healthy

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state. One purpose of the TMDL is to be protective of freshwater fish species within the Willamette Basin, not be protective of ocean/saltwater fish. While there are studies of selenium content in ocean fish and western US stream fish potentially having a moderating effect on mercury in fish tissue, selenium levels in the Willamette Basin streams are not very high and there is not evidence to suggest that the selenium is offsetting the toxicity of methylmercury within the basin. DEQ's TMDL does not affect Oregon Health Authority's fish consumption advisories. Rather, the TMDL is proposed to help reduce mercury in fish tissue over time, with the eventual goal of allowing all beneficial uses, including unrestricted fish consumption.

A_S#3: Suggested Change ID #43

Description: WLA - 700PM - studies are biased due to funding by environmental groups

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because these restrictions are unfounded and based on biased studies funded by environmental groups.

Response: In evaluating the potential for mercury in stream sediment to be transformed, mobilized and methylated, DEQ relied on all available studies published in peer-reviewed literature.

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18. Comments from: Olson, Linda

O_L#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_L#2: Suggested Change ID #3

Description: WLA - 700PM - dredged holes in streams capture mercury

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because dredged holes capture mercury as they are filled in by suspended sediment and small cobbles

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and capture have not been quantified. DEQ is not aware of any studies demonstrating capture of mercury by dredged holes. However, once mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. But, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. Therefore, capture of dissolved and methylated mercury into holes filling with sediment and cobbles is unlikely. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_L#3: Suggested Change ID #4

Description: WLA - 700PM - presence of mercury in streams not proven and suction miners don't use mercury to recover gold

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because DEQ hasn't proven there is measurable mercury in the streams and suction miners do not use mercury to recover gold

Response: As noted in the TMDL, mercury was measured in stream sediment in Brice Creek, Champion Creek, Sharps Creek and the Row River ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). In contrast, the same study found that sediment in streams above the Bohemia Mining District areas average 0.07 mg/kg of mercury. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_L#4: Suggested Change ID #5

Description: WLA - 700PM - density of mercury settles it out before other metals and studies show turbidity from suction dredging dissipates with 80-160m

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because a 1997 study showed water clarity returning to upstream levels within 80-160m downstream of a dredge and mercury is more dense than copper and zinc so it should settle out sooner

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and settling of the many forms of mercury that could be present have not been quantified. DEQ agrees that the density of elemental mercury may assist in it settling out sooner than other metals. Once elemental mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. However, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

O_L#5: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_L#6: Suggested Change ID #9

Description: WLA - 700PM - WA and CA support mercury removal via suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Washington's Department of Ecology hazardous waste and toxics reduction program (2007 press release), EPA and California's Division of Toxic Substance Control program (2000) support suction dredging as an effective method for removing elemental mercury before it can be converted by bacteria to methyl mercury

Response: As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining." A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

O_L#7: Suggested Change ID #11

Description: WLA - 700PM - ocean fish methylmercury type is less toxic than the form fish consumption advisory is based on and may be moderated by selenium

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because methyl mercury cysteine is found in seafood and may be less toxic than the mercury form fish consumption advisories are based on and may be moderated by high selenium content in ocean fish and eating seafood is healthy

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state. One purpose of the TMDL is to be protective of freshwater fish species within the Willamette Basin, not be protective of ocean/saltwater fish. While there are studies of selenium content in ocean fish and western US stream fish potentially having a moderating effect on mercury in fish tissue, selenium levels in the Willamette Basin streams are not very high and there is not evidence to suggest that the selenium is offsetting the toxicity of methylmercury within the basin. DEQ's TMDL does not affect Oregon Health Authority's fish consumption advisories. Rather, the TMDL is proposed to help reduce mercury in fish tissue over time, with the eventual goal of allowing all beneficial uses, including unrestricted fish consumption.

O_L#8: Suggested Change ID #15

Description: WLA - 700PM - eliminate 700PM and pay miners to remove mercury from streams

Comment: The state should eliminate the 700PM permit and pay miners to suction dredge all mercury from Willamette Basin streams

Response: The 700PM permit is scheduled for renewal, at which time comments on the permit will be solicited. Because the 700PM is currently in place, DEQ must evaluate potential impacts to mercury and methylmercury in Willamette Basin streams due to permitted activities and propose reductions, as warranted.

O_L#9: Suggested Change ID #27

Description: WLA - 700PM - TMDL proposes leaving mercury in streams rather than allowing impacts during suction mining which removes mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ staff are idiots or have an anti-mining agenda to propose leaving 100% of mercury and lead in streams rather than risk reintroduction of 2% during removal of 98% with free suction dredging.

Response: DEQ clarifies that the study referenced in the TMDL as Humphreys 2005 found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where

methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining."

O_L#10: Suggested Change ID #30

Description: Reasonable Assurance - Timing - Include a timeframe for how long it will take to reduce mercury in fish

Comment: How long will it take to reduce mercury in our fish? DEQ does not have a complete understanding of the sources of mercury in fish, so can't determine how long mercury will remain at present levels.

Response: This is a topic that DEQ will gather information on through the Monitoring and Assessment strategy. Through the adaptive management process, DEQ will continue to address achievement of the methylmercury criteria. Information gathered through the Monitoring and Assessment Strategy will help DEQ become more specific about the timeframe for achievement of the standard.

O_L#11: Suggested Change ID #44

Description: General - DEQ did not include miners in the decision making process

Comment: NA

Response: DEQ does not agree that miners did not have opportunity to participate in the TMDL process. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. A 25-member Advisory Committee was established with representation by stakeholders from both point sources and nonpoint sources that met 2 years and for which all meetings were publicized and open to the public. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. All affected parties were also invited to review materials, contact DEQ staff with questions and provide comments at a public hearing, held at two locations spanning the Willamette Basin, and throughout a 66 day public comment period.

O_L#12: Suggested Change ID #50

Description: WQMP - TMDL requires cessation of all soil disturbances including all mining

Comment: NA

Response: The requirements outlined in the WQMP do not equate to elimination of all soil disturbances or mining activities. Rather, it means that control measures must be applied to minimize mercury and sediment movement into Willamette Basin waters.

Key processes for TMDL development are to identify the existing sources, estimate the existing loads to waters and determine reductions needed to meet the loading capacity. The reductions needed are then distributed across the sources and are required to be achieved through implementation plans developed by each designated management agency or responsible person. DEQ's permitting program is the designated management agency for permitted point source discharges. The point source allocation of a 10% reduction in mercury in permitted wastewater discharges will be implemented through permit conditions, including the prohibition of discharges from 700PM permitees in the tributaries to Dorena Reservoir. Upland mining activities largely fall under the jurisdiction of the Bureau of Land Management and US Forest Service as designated management agencies. These agencies are required to develop and implement plans to control mercury in soil disturbances that could get into Willamette Basin waters.

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19. Comments from: Dukes, McKenzie

D_M#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

D_M#2: Suggested Change ID #14

Description: WLA - 700PM - suction mining areas limited in state because of impacts to fish habitat, but suction dredging improves fish habitat

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining has been banned throughout the state without evidence of environmental damage to fish bearing streams although dredging can be used to address fish disease and improve habitat

Response: One purpose of the TMDL is to reduce mercury in streams and fish tissue. Structural fish habitat concerns are not within the scope of the TMDL.

D_M#3: Suggested Change ID #15

Description: WLA - 700PM - eliminate 700PM and pay miners to remove mercury from streams

Comment: The state should eliminate the 700PM permit and pay miners to suction dredge all mercury from Willamette Basin streams

Response: The 700PM permit is scheduled for renewal, at which time comments on the permit will be solicited. Because the 700PM is currently in place, DEQ must evaluate potential impacts to mercury and methylmercury in Willamette Basin streams due to permitted activities and propose reductions, as warranted.

D_M#4: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including “floured”), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ’s TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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20. Comments from: Stepnik, John of Willamette Valley Miners

S_J#1: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

S_J#2: Suggested Change ID #9

Description: WLA - 700PM - WA and CA support mercury removal via suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Washington's Department of Ecology hazardous waste and toxics reduction program (2007 press release), EPA and California's Division of Toxic Substance Control program (2000) support suction dredging as an effective method for removing elemental mercury before it can be converted by bacteria to methyl mercury

Response: As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining." A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in

tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

S_J#3: Suggested Change ID #40

Description: WLA - 700PM - DEQ has not considered the Joe Greene and Claudia Wise dredging study

Comment: NA

Response: DEQ searched for peer reviewed, published studies by Joe Greene and Claudia Wise and could not find any. DEQ did find a PowerPoint by Greene and Wise as well as testimony by the pair on permit actions in Washington. However, the studies referenced were the same ones as those in DEQ's TMDL, and no additional information refuting DEQ's interpretation of those studies was offered. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

S_J#4: Suggested Change ID #51

Description: WLA - 700PM - mercury methylates at 70 degrees, which Oregon stream temperatures do not obtain

Comment: Remove prohibitions on suction dredge mining in tributaries to Dorena Reservoir because streams are too warm to allow methylation of mercury

Response: Methylation of mercury is a microbially-mediated process and numerous studies document significant methylation rates occurring in waters and sediments with temperatures down to about 40 degrees F. In general, methylation rates can increase with increasing temperature, but at temperatures above freezing there will still be some microbial methylation occurring. The process of mercury being mobilized from a source area can occur over a very large temperature range. Stream temperatures above Dorena Lake is not a limiting factor impacting mercury releases and releases under the temperatures occurring in this region are well documented. For example, releases of mercury from the nearby Black Butte Mine have been measured during all four seasons, with wintertime fluxes often being larger than those in summer, due to larger discharges during this time period.

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21. Comments from: Connor, Howard of Willamette Valley Miners

C_H#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

C_H#2: Suggested Change ID #7

Description: WLA - 700PM - suction mining removes mercury and no studies show a rise of mercury in fish after dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining can remove mercury from streams and there is no data showing a rise in mercury in fish after dredging has occurred.

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

C_H#3: Suggested Change ID #14

Description: WLA - 700PM - suction mining areas limited in state because of impacts to fish habitat, but suction dredging improves fish habitat

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining has been banned throughout the state without evidence of environmental damage to fish bearing streams although dredging can be used to address fish disease and improve habitat

Response: One purpose of the TMDL is to reduce mercury in streams and fish tissue. Structural fish habitat concerns are not within the scope of the TMDL.

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22. Comments from: Greenlee, Cheryl

G_C#1: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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23. Comments from: Commenters, Various

Cm_V#1: Suggested Change ID #178

Description: WQMP - Conveyance entities - How to separate sedimentation resulting from conveyance systems from that resulting from upland agricultural activities

Comment: Specific to impacts due to modeling used in the load allocations impacting our members, it is worth noting that while DEQ states water conveyance entities "are responsible only for sedimentation resulting from conveyance systems, not from upland agricultural activities," it is unclear how this separation will be made since there is no data allocating mercury to alleged water conveyance activities versus upland agricultural activities. We are concerned this approach may lead to conflict between the named entities, stymieing the types of collaborative partnerships and projects needed to make real progress in improving Oregon's water quality.

Response: DEQ is not requiring water conveyance entities to conduct water quality monitoring at this time, however they will be responsible for submitting TMDL implementation plans to DEQ that clearly show best management practices are/ will be utilized to reduce erosion and sediment movement during operation and maintenance of the system. Water conveyance entities that fully implement their DEQ-approved TMDL implementation plan will be considered to be in compliance with the TMDL.

In addition, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under authority or control by DMAs or responsible person, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

Cm_V#2: Suggested Change ID #311

Description: General - fairness of TMDL for pollutant originating outside of OR

Comment: TMDL seeks to regulate a pollutant that regulated parties have no control over, and which originates from outside of OR and United States.

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority. When streams are listed on the 303(d) list of impaired waterbodies, development of a TMDL is required. Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are also sources within the basin and there are actions that land and water managers

can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality.

Cm_V#3: Suggested Change ID #379

Description: Modeling - insufficient data and uncertainty compounded across multiple models

Comment: NA

Response: The uncertainty in the models and how it was addressed is discussed in Sections 5, 6, 7 and 11 of the TMDL and Sections 2, 3, 4 and 5 of the TMDL Technical Support Document. DEQ intends to use monitoring and modeling during implementation to improve our representation of mercury/methylmercury system in the Willamette Basin. In addition, the Assessment and Monitoring Strategy will identify approaches for continuing to improve our understanding of mercury in the Willamette Basin.

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24. Comments from: Roberts, Stephen of Washington County Department of Land Use & Transportation

R_S#1: Suggested Change ID #105

Description: General - The TMDL and TSD should be peer reviewed

Comment: It is our understanding the DEQ Mercury TMDL modeling provided by TetraTech was not peer reviewed and has not been validated.

Please explain how the TMDL and TSD were peer reviewed.

Response: DEQ's Willamette Basin Mercury TMDL was written by a team of DEQ staff, in coordination with EPA and EPA's contractor Tetra Tech. Prior to finalization of the draft TMDL, additional staff, managers, leadership and attorneys from both DEQ and EPA reviewed the document. The TMDL was then published for public review and comments submitted were carefully considered and changes were integrated, as warranted. The TMDL Technical Support Document was authored by Tetra Tech. The Tetra Tech team was led by a nationally recognized expert and registered Professional Hydrologist with 32+ years of experience in watershed planning, risk assessment, water quality management, and development and application of hydrologic and water quality models.

R_S#2: Suggested Change ID #108

Description: WQMP - LA - Correct Washington County's MS4 Designation

Comment: 1) We request the Final TMDL correct Washington County's status from a Phase 1 MS4, to the proper DMA as a non-urban Nonpoint Source rural DMA. • As a long-term Nonpoint Source Designated Management Agency (DMA), Washington County has been in good standing with Oregon DEQ by meeting and implementing the Tualatin Basin Nonpoint Source TMDL Management Plan for the Rural Area. However, for the urban area, Clean Water Services is the Phase 1 MS4 permittee, and only permittee under the MS4 permit and the only DMA for the urban area. Please correct this in the Appendix E List of DMAs and responsible persons, where the County (No. 103) land use and population, and MS4 status as stated should be shifted to Clean Water Services.

Response: DEQ recognizes that Clean Water Services is the entity responsible for implementing the MS4 permit in the urbanized areas of Washington County. Because it is important to know what stormwater regulations apply to DMAs, DEQ retained the MS4 Phase I designation in Appendix E associated with Washington County and the other 11 cities under CWS's permit, but added "implemented by CWS" to clarify what entity is implementing stormwater requirements for these jurisdictions.

R_S#3: Suggested Change ID #115

Description: WQMP - Stormwater - impact to county staff time

Comment: Section 13.3.1.11 Local Government: Cities and Counties

One of our most significant concerns with the TMDL is the extension of the six minimum stormwater control measures to county areas outside of those already covered by our MS4 Phase II NPDES permit. This requirement would be a significant impact to most counties. The six minimum control measures were originally designed to be implemented within urbanized areas not in rural, less densely populated areas such as where Marion County's TMDLs would take effect. Due to the geographic range covered by county boundaries, implementing these requirements would take significant time and resources without a clear benefit to water quality. County staff could be required to travel as far as 60 miles (about one hour each way) to visit sites implementing these minimum measures.

The increased level of implementation (financial, political, technical) as laid out in the Draft Mercury TMDL creates an unacceptable cost/benefit imbalance. This is especially true as a rural area management DMA (Linn County), with a de minimis effect on mercury. The necessity of creating new staff positions, reporting mechanisms, field review, and enforcement is a financial impact on the County that is not going to change mercury levels. Linn County (and also Washington County) is concerned regarding application of an Illicit Discharge & Detection Elimination program regarding mercury loading for the rural area. This program and EPA guidance targets industrial, commercial, residential urban, and municipal activities such as landfills, fleet storage, etc. Our biggest concern is the cost of an outfall field survey over 2,297 square miles of rural valley, hills, and mountains — which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Again, we are talking about controlling less than 1% of the Mercury in the form of uncontaminated sediment while there are not any proposed controls for 99% of the problem as proposed by the DEQ. Why is that happening?

[Similar language from Washington County]: Our biggest concern is the cost of an outfall field survey over 712 square miles of rural hills – which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Note that DEQ is not requiring an outfall field survey as part of the core management program.

R_S#4: Suggested Change ID #135

Description: WQMP - Stormwater - PS and NPS - Program cost to local governments, citizens

Comment: The proposed TMDL rules will be extremely burdensome for small communities and county governments who lack the resources to design and create the type of programs needed
to identify and reduce 88% of non-point source mercury pollution. Our residents expect clarity, predictability and reasonableness. We cannot justify to permit applicants that the increased burden is due to a potential 1/15th of 1% of potential mercury loading. Applicants could be subject to hiring engineers, paying for design plans, increased structural facilities, and increased County fees and other technical costs – again, in the rural area where vegetation and infiltration generally occurs.
The new requirements are trying to reduce large scale pollution that is beyond the control of local governments to handle alone.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

R_S#5: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require

a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e. 0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

R_S#6: Suggested Change ID #236

Description: WQMP - Stormwater - Need clear means of demonstrating compliance with mercury reduction goals

Comment: An 88% reduction goal for non-point sources of mercury without data or a clear means of measurement sets local governments up for noncompliance.

The identified projects for rural communities are broad, expensive, and not easily measured. Regulated entities cannot create and implement a program without a clear means of demonstrating compliance and remain good stewards of public money.

Collection and measurement practices used to identify mercury pollutants are difficult and uncertain, requiring extensive resources. Both MS4 Phase I and Phase II permit holders will be expected to show their progress toward attaining a 75% reduction benchmark without a firm standard of measurement, increasing the risk of noncompliance.

The Draft document needs to specifically state how a county would demonstrate compliance, including addressing Oregon weather events and slope stability issues that are out of a counties control.

Mercury loading is based on a wide variety of diffuse sources, conditions, variable soils, and weather. According to the Oregon Association of Clean Water Agencies (ACWA), the Draft Mercury TMDL includes invalid bases for methodology. For these reasons, several counties are concerned as to how specifically we would demonstrate compliance.

The Draft TMDL requires a 75 percent reduction of mercury loads across the sector of all “non-permitted urban DMAs”, which is a 1 percent estimated total load. This insignificant impact would be impossible to demonstrate specific to the County. We cannot get into a situation where compliance cannot be demonstrated.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

Counties will work with DEQ basin coordinators to update or revise TMDL implementation plans to include required management programs in the WQMP. DMAs will demonstrate compliance with the mercury TMDL by implementing the DEQ-approved TMDL implementation plan. Compliance with TMDL requirements for MS4 permittees will be demonstrated through compliance with their permit. DEQ acknowledges that events, such as rain, flooding, and fire are natural events beyond human control. DEQ is developing a monitoring strategy to assess implementation actions in meeting mercury water quality standards over time.

R_S#7: Suggested Change ID #371

Description: WQMP - New Plan has no Benefits over Existing 2008 Approved Plan

Comment: With regard to Mercury, we have been implementing a TMDL Mercury program since our approved 2008 Water Quality Management Plan Update. We see no benefit in the new triggers and imposing standards over the current program.

Response: DEQ acknowledges that DMAs, representing varied land uses and sources of mercury, have already been implementing strategies and actions that are protective of water quality. DEQ appreciates the work that land and water managers have accomplished to reduce mercury under the 2006 Mercury TMDL. DEQ anticipates that continued, as well as increased efforts to protect water quality as outlined in this TMDL WQMP, will help the basin reach water quality goals for mercury and other TMDL pollutants.

R_S#8: Suggested Change ID #372

Description: Allocations & WQMP - Development density (rural vs urban) should be taken into account - remove non-permitted urban stormwater as a sector

Comment: There is no legal category of "Non-Permitted Urban Stormwater." The Clean Water Act, by definition, addresses urban stormwater by specifically defining urban area (UA) and requiring stormwater permits for UAs. The Phase II Final Rule required the NPDES permitting authority (i.e., DEQ) to develop a set of designation criteria to all small MS4s located outside of a UA serving a jurisdiction with a population of at least 10,000 and a population density of at least 1,000 people/square mile. Washington County's rural population density is approximately 44 people/square mile, or 95% short of an UA. This fact demonstrates the County is not and cannot be a defined UA, nor a small MS4, nor the non-existent "Non-Permitted Urban Stormwater" discharger.

The TMDL is not an MS4 program, and not a permit program, although an NPDES permit can include implementation activities of a TMDL program. Nonetheless, Washington County has TMDL responsibility only in the rural area, since Clean Water Services (a Service District) is the NPDES sole permittee for the entire urban area of the County.

There is a strong correlation between stormwater pollutants and development density, which is why counties should not be required to uphold the same permit requirements as incorporated communities. This matter was contemplated during the development of the MS4 Phase TI permit. After number of concerns were raised by counties, all counties were put into the "Small Community" category even though they exceed 10,000 people. The MS4 Phase II definition of Small Communities is, " … any permit

registrant that has a population of less than 10,000 people or is a county that is the sole permit registrant/applicant. If the county is a co-registrant at the time of permit coverage or becomes a coregistrant at any time of permit coverage under this permit, it is not eligible for this exemption." This logic should be applied to this TMDL permit as well by allowing all counties to be subject to the same requirements as communities with a population of< 5,000 people.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities and roads. DEQ supports these core management programs, such as enforcement of prohibited pollutants, and ensuring erosion control measures are included in county building and grading permits as good approaches for county management. In addition, DEQ included a table of example BMPs and strategies most relevant to county activities.

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25. Comments from: Pepiot, Tom of President of the Bohemia Mine Owners Association

P_TP#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

P_TP#2: Suggested Change ID #4

Description: WLA - 700PM - presence of mercury in streams not proven and suction miners don’t use mercury to recover gold

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because DEQ hasn't proven there is measurable mercury in the streams and suction miners do not use mercury to recover gold

Response: As noted in the TMDL, mercury was measured in stream sediment in Brice Creek, Champion Creek, Sharps Creek and the Row River ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). In contrast, the same study found that sediment in streams above the Bohemia Mining District areas average 0.07 mg/kg of mercury. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

P_TP#3: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TP#4: Suggested Change ID #17

Description: WLA - 700PM - scientists trespassed on mining claims to conduct studies referenced in the TMDL

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because those who conducted some of the studies DEQ relies on committed mineral trespass when stream sampling was undertaken.

Response: This comment is outside the scope of DEQ's authority. DEQ does not have the authority to determine whether or not mineral trespass was committed. The determination as to whether or not mineral trespass occurred would not change the utility of the studies for determining the presence of mercury in the subject streams, which is the basis for DEQ's prohibition of suction mining, since multiple other studies show the potential for existing mercury to be disturbed, mobilized and methylated in the reservoir downstream and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury.

P_TP#5: Suggested Change ID #18

Description: WLA - 700PM - dredging only allowed for a few weeks per year with turbidity limits so mercury impacts are low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because due to ODFW in water work windows, miners can only work in streams for a few weeks a year when water and sediment flows are low and can only make turbidity for 300 feet, so suction dredges causing mercury in streams is not a big issue.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TP#6: Suggested Change ID #21

Description: WLA - 700PM - suction mining is not the source of mercury and mercury contribution from suction mining is low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ's studies show mining is only 1% of the mercury load for the Willamette Basin, so mining is not a mercury issue. This TMDL proposal unfairly burdens suction dredge miners as point-source polluters when they are not the source of the mercury. Abandoned mines on federal land are responsible.

Response: DEQ clarifies that the TMDL modeling indicates that all permitted wastewater point source discharges contribute approximately one percent of the mercury load within the Willamette Basin. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated,

transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. Finally, DEQ's TMDL also requires reduction of mercury by 95% from legacy mine-related sources, with the federal agencies as designated management agencies responsible for implementation.

P_TP#7: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including "floured"), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TP#8: Suggested Change ID #49

Description: General - DEQ did not include miners in the TMDL Advisory Committee

Comment: NA

Response: The Willamette Basin drains approximately 12% of the state of Oregon or 11,460 square miles, includes 12,760 miles of streams and supports 70% of Oregon's population. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL, including establishing an Advisory Committee with 25 non-DEQ members that committed to participate for 2 years to provide input on source identification, allocations and prioritization for implementation. Advisory Committee members were selected in consideration of the 2006 TMDL, which identified nonpoint source land uses as the largest mercury source reductions needed. Included in the Advisory Committee was a representative from the Oregon Department of Geology and Mineral Industries. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. While DEQ

believes the right proportional participation balance was struck on the large Advisory Committee, DEQ will consider inviting a representative of the suction dredge mining community to participate in future Willamette Basin Advisory Committee opportunities where relevant.

P_TP#9: Suggested Change ID #92

Description: WLA - 700PM - CA water temperatures and mercury content and sources are different than in tributaries to Dorena Reservoir

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because studies in CA are in streams with higher temperatures and where historical use of mercury in sluice boxes contributed higher mercury contamination than in streams in the Bohemia Mining District

Response: Different sources of mercury and temperature of streams are not relevant to the setting of wasteload allocations in the Willamette Basin Mercury TMDL. Rather, the TMDL acknowledges that mercury contamination exists in streams within the Bohemia Mining District and DEQ must take action on regulated discharges to reduce the potential for mercury to be mobilized and methylated. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

P_TP#10: Suggested Change ID #94

Description: WLA - 700PM - remediation of Champion Mine also cleaned up mercury in Brice Creek so additional sampling is needed

Comment: Do not prohibit suction dredge mining in Brice Creek because Champion Mine remediation also cleaned up mercury in Brice Creek and additional sampling is needed to show current mercury contamination levels

Response: In response to this comment, DEQ reviewed available reports on the Champion Mine remediation activities and post-removal action sampling, including sediment sampling in Champion Creek between 2004 and 2012 (report available at: https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=bb0d35d9-a2bd-4906-bc01-ad7b9dc1b9c6pdf&s=Champion Mine 2012 FINAL Monitoring Report 1-10-13.pdf). DEQ did not find that removal actions were conducted within Champion Creek, rather tailings piles were removed from the uplands and a wetland treatment system was installed to prevent metals contaminated discharges from leaving the uplands. Post-removal action sampling at five locations within Champion Creek between 2004 and 2012 detected mercury at concentrations ranging from 0.08 mg/kg to 8.78 mg/kg. Sediment samples in 2012 detected mercury in Champion Creek sediments ranging from 0.16 mg/kg to 5.7 mg/kg. DEQ included this reference and updated information in the TMDL as further confirmation of the

presence of mercury contamination in Champion Creek. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

P_TP#11: Suggested Change ID #96

Description: WLA - 700PM - there are several techniques to remove mercury from streams or make it less toxic, including suction dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction mining, chemical and biological treatments, physical barriers, phytoremediation and water quality manipulation can be used to remove or immobilize mercury in streams.

Response: DEQ appreciates the list of potential techniques for remediation of mercury contamination in streams, some of which may be employed during multi-agency remediation efforts on the streams and upland areas identified as contaminated by mercury in Sections 9.2.3 and 13.3.1.2 of the TMDL and WQMP. Because the 700PM is currently in place, DEQ must evaluate potential impacts to mercury and methylmercury in Willamette Basin streams due to permitted activities and propose reductions, as warranted. DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the studies referenced in the TMDL found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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26. Comments from: Hays, Jeff

h_#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

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h_#2: Suggested Change ID #31

Description: WLA - 700PM - many waterbodies have fish consumption advisories

Comment: Remove prohibitions on suction dredge mining in tributaries to Dorena Reservoir because, according to EPA's Fish Consumption Advisories website, many waterbodies across the country, including ocean waters, have fish and shellfish with elevated mercury levels.

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state.

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27. Comments from: Stocking, Richard

St_R#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction

dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

St_R#2: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

St_R#3: Suggested Change ID #24

Description: WLA - 700PM - NPS mercury contributions much greater than suction mining contributions

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because dredges contribute significantly less mercury than nonpoint sources so DEQ should not discriminate against dredges as tools to remove mercury from streams with no cost.

Response: DEQ agrees that the TMDL modeling indicates that nonpoint and background sources contribute more than 94% of the mercury load within the Willamette Basin, while all permitted wastewater point source discharges contribute approximately one percent. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL

prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

St_R#4: Suggested Change ID #47

Description: Source Assessment - Dorena Reservoir watershed - where and when were samples taken?

Comment: NA

Response: The sources and timing of data used in development of the TMDL is explained in Section 2.0 of the TMDL Technical Support Document, available on DEQ's website. The data themselves characterize observed mercury concentrations in the water column, fish tissue, and sediment. Based on available records, mercury monitoring in the Willamette River Basin dates back to 1969, however, the TMDL applies more recent data collected between 2002 to 2017. Figure 2-2 in the Technical Support Document shows the temporal distribution of mercury sampling in the basin whereas Figure 2-1 shows the spatial distribution of mercury sampling at the HUC8 catchment scale. Monitoring data informed modeling efforts that were employed to estimate existing mercury loads from various point and nonpoint sources throughout the basin, as explained in Sections 1.2, 3.0, 4.0 and 5.0 of the TMDL Technical Support Document. Specific evaluations on the Dorena Reservoir are explained in Section 5.3.4 of the TMDL Technical Support Document. In addition, DEQ referenced studies conducted in multiple tributaries to Dorena Reservoir, as detailed in Sections 9.4.1.2 and 13.2.1.1.2 of the TMDL and Water Quality Management Plan.

St_R#5: Suggested Change ID #51

Description: WLA - 700PM - mercury methylates at 70 degrees, which Oregon stream temperatures do not obtain

Comment: Remove prohibitions on suction dredge mining in tributaries to Dorena Reservoir because streams are too warm to allow methylation of mercury

Response: Methylation of mercury is a microbially-mediated process and numerous studies document significant methylation rates occurring in waters and sediments with temperatures down to about 40 degrees F. In general, methylation rates can increase with increasing temperature, but at temperatures above freezing there will still be some microbial methylation occurring. The process of mercury being mobilized from a source area can occur over a very large temperature range. Stream temperatures above Dorena Lake is not a limiting factor impacting mercury releases and releases under the temperatures occurring in this region are well documented. For example, releases of mercury from the nearby Black Butte Mine have been measured during all four seasons, with wintertime fluxes often being larger than those in summer, due to larger discharges during this time period.

St_R#6: Suggested Change ID #92

Description: WLA - 700PM - CA water temperatures and mercury content and sources are different than in tributaries to Dorena Reservoir

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because studies in CA are in streams with higher temperatures and where historical use of mercury in sluice boxes contributed higher mercury contamination than in streams in the Bohemia Mining District

Response: Different sources of mercury and temperature of streams are not relevant to the setting of wasteload allocations in the Willamette Basin Mercury TMDL. Rather, the TMDL acknowledges that mercury contamination exists in streams within the Bohemia Mining District and DEQ must take action on regulated discharges to reduce the potential for mercury to be mobilized and methylated. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

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28. Comments from: Karnosh, Michael of The Confederated Tribes of the Grand Ronde Community of Oregon

K_M#1: Suggested Change ID #321

Description: General - Support for TMDL

Comment: Supports a TMDL approach that identifies and manages all sources of mercury, applies an adaptive implementation and management approach and holds land and water managers accountable for their activities that impact mercury levels

Response: DEQ agrees that using adaptive management to address sources of mercury in the basin in addition to enforcing water quality standards and rules will help to improve water quality in the basin.

K_M#2: Suggested Change ID #323

Description: WQMP - Sections 13, 14, Appendix E - Schedule required for implementation success

Comment: Comment supports the having specific timelines for implementation as well as the 5yr and annual reviews specified in Sections 13, 14 and Appendix E.

Response: DEQ agrees that specific implementation timelines and annual reporting are important for tracking implementation of the TMDL, as well as for successfully implementing adaptive management.

K_M#3: Suggested Change ID #324

Description: WQMP - Sections 13, 14 and Appendix E - Public Review of Annual Reports and 5-Yr Review

Comment: Comment letter states that it will be important to have opportunity for public review and comment of the reports described in Sections 13, 14 and Appendix E, in particular, the 5-yr Willamette TMDL review in order to hold DMAs and managers accountable for their implementation actions. In addition, public review can encourage identification of creative solutions from multiple perspectives.

Response: All DMA reports and implementation plans are available for public review. Please use DEQ's public records request form to request copies of implementation plans and reports. The form can be accessed on DEQ's website: https://www.oregon.gov/deq/about-us/Pages/Requesting-Public-Records-Form.aspx

The results from the 2018 Willamette Basin TMDL Five Year Review are currently being compiled and the report will be available on DEQ's website by the end of 2019. The 2014 Willamette Basin TMDL Five Year Review report is available on DEQ's website: https://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Implementation.aspx

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K_M#4: Suggested Change ID #325

Description: WQMP - Appropriately addresses both NPS's and PS's of mercury even though much originates from outside the basin

Comment: Land and water managers have the ability and responsibility to take actions to measurably reduce humans' exposure to mercury, even if much originates from elsewhere

Response: DEQ agrees that land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality.

K_M#5: Suggested Change ID #326

Description: WQMP - Section 13.3 Agriculture and Forestry Sectors

Comment: Transport of mercury to waters occurs largely due to export from the landscape. Therefore specific reduction measures must be REQUIRED of both forestry and agricultural sectors in order to achieve success. Voluntary actions are not sufficient.

Response: DEQ agrees that reducing nonpoint sources of mercury and sediment movement are critical to successful implementation of this TMDL. Implementing the TMDL is not voluntary and all DMAs identified in the WQMP must implement actions that reduce mercury and sediment movement to the Willamette River and its tributaries.

DEQ does not prescribe specific best management practices, rather designated management agencies such as ODF and ODA are responsible for identifying measurable objectives and milestones for implementation strategies and goals within the first 18 months after TMDL issuance. If water quality trends within a HUC8 watershed are shown not to improve over time and that could be attributed to human sources, DEQ will require revision of DMA and responsible person implementation plans to better address mercury loading that they can control or reduce.

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29. Comments from: NA, Jamie

NA#1: Suggested Change ID #12

Description: WLA - 700PM - miners are not required to comply with state statutes or regulations on US Forest lands that interfere with mining

Comment: Miners are not required to comply with state statutes or regulations on US Forest Service land when the regulations interfere with mining

Response: There is technical evidence in the record of the environmental impacts of suction dredge mining supporting the need for regulation. Additionally regulation of suction dredge mining was recently affirmed by the Oregon Supreme Court in Eastern Oregon Mining Association v. DEQ, 365 Or. 313 (2019).

NA#2: Suggested Change ID #13

Description: WLA - 700PM - mining claimants have the preferential right to extract minerals within the claim

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mining claimants have the preferential right to extract minerals within the claim

Response: DEQ does not dispute mining claimants rights to extract minerals within a claim. DEQ regulates point source discharges by suction dredges under the NPDES 700PM permit. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg

(Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

NA#3: Suggested Change ID #19

Description: WLA - 700PM - mining claimants will require financial reimbursement

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mining claimants require financial reimbursement for loss of Federal Mining Mineral Estate personal property because hand operated mining will not allow demonstration of a reasonable prospect of making a profit in order to retain a valid BLM claim.

Response: Your comment is in regards to financial impacts to mining claims as a result of the TMDL. Section 303(d) of the Clean Water Act (CWA) requires States to develop TMDLs to reduce pollutant loading to waters of the state in order to attain and maintain water quality standards and support identified beneficial uses for those waters. The prohibition on suction dredging in specific waters is intended to limit the mobilization of sediment, mercury and methylmercury in those waters. It is DEQ's determination that this is required to make necessary progress toward meeting the water quality standard and that this regulation does not require financial reimbursement to mining claimants.

NA#4: Suggested Change ID #21

Description: WLA - 700PM - suction mining is not the source of mercury and mercury contribution from suction mining is low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ's studies show mining is only 1% of the mercury load for the Willamette Basin, so mining is not a mercury issue. This TMDL proposal unfairly burdens suction dredge miners as point-source polluters when they are not the source of the mercury. Abandoned mines on federal land are responsible.

Response: DEQ clarifies that the TMDL modeling indicates that all permitted wastewater point source discharges contribute approximately one percent of the mercury load within the Willamette Basin. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of

mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. Finally, DEQ's TMDL also requires reduction of mercury by 95% from legacy mine-related sources, with the federal agencies as designated management agencies responsible for implementation.

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30. Comments from: Knoll, Charles R. of Linn County Road Department

K_C#1: Suggested Change ID #115

Description: WQMP - Stormwater - impact to county staff time

Comment: Section 13.3.1.11 Local Government: Cities and Counties

One of our most significant concerns with the TMDL is the extension of the six minimum stormwater control measures to county areas outside of those already covered by our MS4 Phase II NPDES permit. This requirement would be a significant impact to most counties. The six minimum control measures were originally designed to be implemented within urbanized areas not in rural, less densely populated areas such as where Marion County's TMDLs would take effect. Due to the geographic range covered by county boundaries, implementing these requirements would take significant time and resources without a clear benefit to water quality. County staff could be required to travel as far as 60 miles (about one hour each way) to visit sites implementing these minimum measures.

The increased level of implementation (financial, political, technical) as laid out in the Draft Mercury TMDL creates an unacceptable cost/benefit imbalance. This is especially true as a rural area management DMA (Linn County), with a de minimis effect on mercury. The necessity of creating new staff positions, reporting mechanisms, field review, and enforcement is a financial impact on the County that is not going to change mercury levels. Linn County (and also Washington County) is concerned regarding application of an Illicit Discharge & Detection Elimination program regarding mercury loading for the rural area. This program and EPA guidance targets industrial, commercial, residential urban, and municipal activities such as landfills, fleet storage, etc. Our biggest concern is the cost of an outfall field survey over 2,297 square miles of rural valley, hills, and mountains — which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Again, we are talking about controlling less than 1% of the Mercury in the form of uncontaminated sediment while there are not any proposed controls for 99% of the problem as proposed by the DEQ. Why is that happening?

[Similar language from Washington County]: Our biggest concern is the cost of an outfall field survey over 712 square miles of rural hills – which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and

applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Note that DEQ is not requiring an outfall field survey as part of the core management program.

K_C#2: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures – the rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

K_C#3: Suggested Change ID #188

Description: WQMP - Stormwater - MS4 boundary needs to be defined in order to determine where non-urban DMA requirements apply

Comment: Jurisdictions with an MS4 permit become responsible for the non-point source pollutants outside of the permit boundary. For these areas, the local municipality will need to implement the Six Minimum Control Measures required for non-permitted urban DMA. However, there is no clear definition for "MS4 permit boundary" to identify the areas that fall into this category. The vague requirement creates additional uncertainty and makes it more difficult for local municipalities to comply. The vague boundaries also question the previous condition that a DMA could partner with adjacent municipalities to implement the Six Minimum Control Measures. Whether or not this partnership is still allowed is unclear.

Response: The term "MS4 permit boundary" describes where MS4 permitting requirements apply within a permit holder's jurisdiction. Each MS4 permit holder has information indicating where that boundary is. Generally, DEQ uses the Urban Growth Boundary (UGB) for Phase I permit holders. For Phase II permit holders, the boundary is based on the U.S. Census designated urbanized area (UA), which is defined based on a number of characteristics. MS4 permit holders must apply permitting requirements based on their permit specifications.

The six stormwater control measures would apply to areas which are outside the MS4 permit boundary, but still within the city or county jurisdiction. In cases where cities and counties can show that the MS4 permit covers their entire jurisdiction, where appropriate, then the six stormwater control measures are already being applied based on implementing the MS4 permit. Cities and counties must include this important information in their TMDL implementation plan update and clearly articulate how the six stormwater requirements are being met. The overall goal is to ensure that urban areas in MS4 jurisdictions are implementing, at a minimum, the six stormwater control measures identified in Table 13-10 throughout its jurisdiction. DEQ added language to the WQMP to clarify these goals.

DEQ also made changes to the WQMP to affirm that cities or counties may continue to partner with other jurisdictions, as appropriate, to meet these requirements. If jurisdictions pursue these partnerships, DEQ encourages cities and counties to have formal agreements in place to ensure requirements are met.

K_C#4: Suggested Change ID #190

Description: General - Implementation of the TMDL will result in mercury increases in the Willamette River

Comment: This letter is submitted in concern that the proposed DEQ program may in fact result in an increase in Mercury levels and not a more preferable decrease in mercury levels in the Willamette River. This is due to the failure of the TMDL program to properly identify and address the sources of Mercury in the Willamette Basin and model its movement.

This rule as proposed will not provide any improvement to the environment. In fact, this rule, as proposed may result in the opposite resulting in an increase of mercury levels in the Willamette River. The most disappointing fact about DEQ's proposed TMDL is that the plan of reducing suspended solids loading into the Willamette River Basin to reduce Mercury levels will only increase the level of mercury. In other words, ODEQ is requiring the Local Agencies to complete work which will ultimately result in making the Mercury Levels in the Willamette River higher and not lower. This grave mistake is the result of the DEQ not properly and responsibly analyzing the data that is available as described and covered in this letter. The mercury reduction requirements established in the TMDL primarily target non-point source pollution, which the DEQ asserts is present without any actual sampling and measurement, originates from the atmosphere and settles in the soil. Non-point source pollutants are extremely difficult to identify or measure accurately and are grossly over estimated by the DEQ's WQIP to make up about 96% of mercury pollution in our waterways. How can a plan be developed that is based on an estimate of approximately 96% of the source that cannot be measured? The answer is that it cannot. This is especially true when atmospheric deposition is not the source of Mercury in the Willamette River. The DEQ only needs to look at and use the data that they have and collect additional valid data to realize this.

Based on select 2002 data (see tables in original comment pdf), it is expected that sediments and waters from rivers in Linn County flowing into the Willamette River would actually mix with and dilute and reduce the concentration of Mercury in the Willamette River. If you take this away the mercury levels in the Willamette River will increase or at best remain the same. This is a waste and a shame when it is recognized that all this effort as proposed by DEQs TMDL will over time eventually result in an actual increase in the levels of mercury in the water, sediments and fish of the Willamette River. This is the result of the failure of the ODEQ to properly characterize the source and origin of Mercury that is presently in the Willamette River. It is also the result of the failure of the ODEQ in being able to manage it using their existing approved regulatory programs.

I have prepared this letter after reviewing the proposed Willamette Basin Total Mercury Designated Load (TMDL) regulations. I am a licensed Environmental Engineer with over 40 years of experience which includes over 20 years in corporate environmental programs associated with chemical and metals manufacturing. I was also previously employed by the DEQ in its permit compliance programs. I also have considerable experience working with local agencies.

Response: DEQ disagrees with the assertion that mercury will be increased in the Willamette River through implementation of the TMDL. DEQ's analysis is presented at length in the TMDL and Section 14 provides an accountability framework to support the reasonable assurance conclusions that the goals of reducing mercury in the waters and fish within the Willamette Basin will be achieved.

K_C#5: Suggested Change ID #192

Description: WQMP - fails to address known, actual legacy mining and active sources

Comment: DEQ needs to provide a program to reduce mercury contamination at its source. It is a known fact that there were and are mercury and gold mines in the Cascades. Mercury is and has been used to purify and process gold ore. If these sites are not controlled then residues of mercury from these sites will continue to be transported into tributaries and basins that flow into the Willamette River. After these mining activities were stopped, a number of Dams were constructed that have since accumulated sediments that would contain mercury. An example of this could be the Santiam River which would explain the mercury levels in this river. The sediments collected behind the dams need to be evaluated for removal as a means to reduce and control mercury in the Willamette River. The mercury and gold mining sites, current and past also need to be evaluated for control of residues of mercury at these sites. Presently there is not any known effort of this occurring. The Department of Oregon Geology and Minerals Industries (DOGAMI) needs to be involved in this effort of identifying the sources of mercury and actual as well as potential for mercury contamination in the Willamette Basin. DOGAMI oversees the NPDES wastewater discharge program for mines in Oregon. However, the DEQ has not involved DOGAMI in development of this TMDL program. This needs to change — the sooner the better. There may be other examples and locations of actual positive and measurable means to remove and reduce mercury in the Willamette Watershed. We can only hope that the DEQ will address these. Increased and expensive mercury reduction programs for cities and counties that do not have any mercury to control is a waste of resources in light of the actual known sources of mercury and ODEQ's failure to recognize and address the actual sources of mercury and develop an program to reduce these known and documented sources.

In development of the proposed rules to reduce mercury levels in the Willamette River, the Oregon Department of Environmental Quality has failed to make any requirement to reduce the actual measureable and known sources of mercury. This includes the contamination left behind by historic gold mines that used mercury to refine and process gold, the contamination resulting from actual mercury mines, mercury associated with known geological sources of mercury, and mercury associated with industrial sources and even sources associated with recycling of Mercury waste products. Some of these sources are identified and mentioned by ODEQ in their reports but there is not any mention of how to better manage and control and/or remove these sources. The question is this — why is the DEQ not proposing to manage and control these sources? This question needs to be answered by the DEQ.

Response: DEQ disagrees with the comment that presently there is no known effort to evaluate and control past mercury and gold mining sites in the Willamette Basin. As noted in Sections 9.2.3 and 13.3.1.2 of the Willamette Basin Mercury TMDL, DEQ continues to collaborate with EPA, BLM and USFS on investigation, assessment and remediation of the abandoned mine lands identified on Table 9-2 within the Willamette Basin. DEQ also disagrees that DEQ has not involved DOGAMI in mercury contamination from mining and development of the TMDL, because DOGAMI participated on the Willamette Basin mercury TMDL Advisory Committee and is a Designated Management Agency named in the TMDL, which must develop and implement a TMDL Implementation Plan. Finally, DEQ appreciates the acknowledgement of mercury being captured in sediment behind dams in the basin. As noted in Sections 9.2.2 and 13.3.1.22, the TMDL requires evaluation of the largest reservoirs in the basin for presence of mercury and methylation potential. The US Army Corps of Engineers, US Bureau of Reclamation, Eugene Water and Electric Board and Portland General Electric are required to develop and implement TMDL Implementation Plans. These plans must include implementation of control measures, which may include sediment removal or isolation.

K_C#6: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

K_C#7: Suggested Change ID #197

Description: WLA - Stormwater - reduction for stormwater is not proportional to impact - regulate other entities instead

Comment: The draft TMDL indicates that estimated mercury loads from all combined, non-permitted urban area stormwater discharges is approximately one percent of the overall load in the Willamette Basin. However, the TMDL requires a 75 percent reduction of mercury loads across this sector, which appears to be weighted beyond the actual impact of the sector. This statement more than any other in the Draft Mercury TMDL demonstrates the de minimis impact such sources potentially contribute. Knowing that 99% of mercury loading is from other sources, it is unreasonable to expect Linn County or any other rural county to create an additional review process, hire additional staff, create a new Mercury monitoring program, enforcement mechanisms, etc.to control something that is not even there. DEQ should regulate other sources of mercury, not stormwater.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned

lands, properties, facilities and roads. Revising county requirements addresses many of the concerns the commenters expressed.

To further clarify, counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction. The 75% total mercury load reduction required for city stormwater discharges only applies within permit boundaries for those counties with MS4 permits.

As noted in Section 13.3.1.11, environmentally significant concentrations of mercury are found in stormwater from developed areas and, therefore, reductions are needed. In setting allocations, one scenario DEQ considered was to equally apply the 88% reduction to each sector. This is the total reduction needed throughout the basin. As explained in the closing paragraphs of Section 10 in the TMDL, DEQ ultimately considered the disparate impacts from atmospheric deposition, relative contributions, confidence in achieving reductions, and other factors for each sector in assigning allocations. The 75% reduction for the small non-permitted urban stormwater sector aligns with the reductions required from the permitted stormwater sector. In addition, the stormwater control requirements for cities without MS4 permits are less stringent than MS4 permits, and these smaller cities have additional time to comply with each stormwater control measure. DEQ's TMDL is comprehensive in regulating all known sources of mercury, yet also considered the varying levels of effort needed by each sector.

DEQ did not make any changes to the stormwater allocations, but added clarifying language as to where each applies.

K_C#8: Suggested Change ID #207

Description: WQ Standards - TMDL lacks description of targets

Comment: There is also not any clear statement by DEQ as to what are the specific limits for meeting mercury in the water, sediments, and suspended solids to use as a goal or discharge limit when treating the mercury at its source.

Response: DEQ clarifies that 'discharge limits" are set in NPDES permits, which are typically required for any discharges of mercury or other pollutants, including as a result of any 'treatment' or other processes. Effluent limits not to be exceeded for mercury, total suspended solids and any other pollutants with reasonable potential to be present in the discharge are evaluated and set as enforceable permit conditions upon issuance of a permit. Water quality criteria guide the development of permit effluent limits. Oregon's currently effective EPA approved mercury criteria (for human health and aquatic life) are available on DEQ's website: https://www.oregon.gov/deq/Rulemaking%20Docs/tables303140.pdf. Oregon does not have water quality criteria for sediment. Because many waters within the Willamette Basin do not currently meet the mercury human health criterion, are listed on the 303(d) list of impaired waters and fish consumption advisories are in place by Oregon Health Authority, DEQ revised the TMDL as the plan for attaining the water quality criterion. As noted in the TMDL, use of a mercury translator developed for the basin determined that a water column mercury target of 0.14 ng/L is needed to meet the criterion.

K_C#9: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and

agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e. 0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these

cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

K_C#10: Suggested Change ID #226

Description: WQMP - Stormwater - Entities required to implement reduction programs where mercury is not detected

Comment: The WQMP acknowledges the lack of data available to determine the amount of mercury displaced by smaller communities but still imposes new, more strict regulations with difficult reduction benchmarks. For example, tests conducted on road construction projects in Linn County could not detect any amount of mercury in the soil, and yet they would still be required to perform the additional reduction programs under the new rule. Even with this uncertainty, small municipalities (including two additional counties) will be required to reduce mercury loads from nonpoint sources by 75%.

Response: DEQ acknowledges that there is uncertainty inherent to modeling estimated mercury loads, particularly from source categories with limited data available. However, as noted in Section 13.3.1.11, adequate information on mercury in stormwater from urbanized areas is available for DEQ to conclude that environmentally significant concentrations of mercury are found in stormwater from developed areas and, therefore, reductions are needed. DEQ further clarifies that the 75% reduction noted in the comment applies only to stormwater discharges into waters within the Willamette Basin from developed areas not already covered by an MS4 permit.

K_C#11: Suggested Change ID #236

Description: WQMP - Stormwater - Need clear means of demonstrating compliance with mercury reduction goals

Comment: An 88% reduction goal for non-point sources of mercury without data or a clear means of measurement sets local governments up for noncompliance.

The identified projects for rural communities are broad, expensive, and not easily measured. Regulated entities cannot create and implement a program without a clear means of demonstrating compliance and remain good stewards of public money.

Collection and measurement practices used to identify mercury pollutants are difficult and uncertain, requiring extensive resources. Both MS4 Phase I and Phase II permit holders will be expected to show their progress toward attaining a 75% reduction benchmark without a firm standard of measurement, increasing the risk of noncompliance.

The Draft document needs to specifically state how a county would demonstrate compliance, including addressing Oregon weather events and slope stability issues that are out of a counties control.

Mercury loading is based on a wide variety of diffuse sources, conditions, variable soils, and weather. According to the Oregon Association of Clean Water Agencies (ACWA), the Draft Mercury TMDL includes invalid bases for methodology. For these reasons, several counties are concerned as to how specifically we would demonstrate compliance.

The Draft TMDL requires a 75 percent reduction of mercury loads across the sector of all "non-permitted urban DMAs", which is a 1 percent estimated total load. This insignificant impact would be impossible to demonstrate specific to the County. We cannot get into a situation where compliance cannot be demonstrated.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

Counties will work with DEQ basin coordinators to update or revise TMDL implementation plans to include required management programs in the WQMP. DMAs will demonstrate compliance with the mercury TMDL by implementing the DEQ-approved TMDL implementation plan. Compliance with TMDL requirements for MS4 permittees will be demonstrated through compliance with their permit. DEQ acknowledges that events, such as rain, flooding, and fire are natural events beyond human control. DEQ is developing a monitoring strategy to assess implementation actions in meeting mercury water quality standards over time.

K_C#12: Suggested Change ID #290

Description: Data sources - Data is inadequate, soil data collected during bridge work by Linn Co shows no mercury, DEQ does not provide data when requested

Comment: The highest contamination is found in the headwaters of the Willamette River where most of these mining activities have occurred. As previously reported to the DEQ in correspondence from on October 28, 2015 the following concentrations were measured in the Willamette River by the ODEQ in the fall of 2002. The sampling results obtained from the ODEQ provides limited if any monitoring results for other rivers that are tributaries of the Willamette Valley. As an example, for Linn County which is primarily a rural agricultural country, only results for the Santiam River near the City of Jefferson were provided by the ODEQ for 2002. As provided below, the concentration in the Santiam River was much

lower than the Willamette River. See table. Actual Hg analytical data has been very difficult if not impossible to obtain from the DEQ. Requests for actual data have been made without any response. The most recent "Revised Willamette Basin Mercury TMDL Draft for Public Comment" did provide some data of Mercury in Suspended Solids for the Mainstream Willamette and some of its tributaries in a tabulated graphical form. This has been extrapolated and summarized in the following table so as to present and provide an understanding of mercury transport within the Willamette Basin and also demonstrate what actual limited data there is. See table. The above table was developed using data extrapolated from Figure 3 and Figure 6 of the Draft document. This table indicates that there is a major source of Mercury originating in the headwaters of the Willamette River that is diluted as it flows north to the Columbia River. It would be good to be able to incorporate river flow rates, total suspended solids concentration, and mercury levels into a program to model the source and transport of mercury in the Willamette Basin. However, there is not any access to river flow data and dates when the samples were taken so as to provide a mass balance of Mercury and sediment transport for the Willamette River and its tributaries. Also, there really is not much data available or at least made available. For instance, there is not any data whatsoever for three large sub basins and only limited data (4 or less samples each) for all listed sub-basins. How can any program be properly set up for reduction in mercury levels be based on limited and in many places no data? The answer is that it cannot. Linn County Road Department has completed Hazardous Materials Corridor Assessments for a number of bridge and road improvement projects during the past few years. For a number of these projects, soil samples were collected for determination of Mercury. In each case, the results have indicated non-detectable levels of Mercury in the soil. If atmospheric deposition of Mercury is truly occurring, then the soils would indicate the presence of Mercury. A review of ODEQ data does not indicate any collection and measurement of soil samples for mercury. If am wrong and there is soil and vegetation data available then please let me know and provide me the data.

Response: Flow and sediment transport processes from the Willamette River Basin HSPF model informed the mercury mass balance model. The HSPF model simulates upland hydrology and the resulting flow rates for major tributaries and the Willamette River at an hourly time-step for a multi-year simulation period. The HSPF model is calibrated to flows observed at gages in the watershed. The HSPF model also simulates sediment erosion on the landscape and transport throughout the stream network. Thus, flow and sediment processes in the basin are incorporated into the technical assessment for the TMDL. In addition, mercury loads modeled with the mass balance model were calibrated to observed mercury loads at key locations (i.e., long-term flow and mercury monitoring sites) in the basin, including the basin outlet.

All of the data considered during development of the TMDL is provided in the TMDL documents, including the Appendices, which include the TMDL Technical Support Document, prepared by Tetra Tech on EPA's behalf. These documents are all currently available on DEQ's website. All datasets with associated metadata used in the development of the TMDL will be made available on DEQ's website after issuance of TMDL.

K_C#13: Suggested Change ID #291

Description: Source Assessment - atmospheric deposition as a source of mercury is false and unproven - re-evaluate the TMDL for different conclusions to avoid adverse environmental and public health consequences

Comment: Existing data shows that the primary source of Mercury in the Willamette Basin comes from the headwaters of the Willamette River located in Lane County as well as the mines and geologic

resources in the Cascades. There is not any actual sample results or data that shows that Mercury is deposited in the Willamette Valley from the atmosphere. The ODEQ seems to want to concentrate on atmospheric deposition of Mercury that they have not any documentation of other than hypothetical as a means to develop a means to reduce Mercury. As a result, this will result in a waste of time and money for all involved in trying to reduce Mercury levels following guidance from the ODEQ that has been recklessly developed.

The DEQ needs to focus on the known and measured sources of mercury as the TMDL plan which it presently does not.

The Total Mercury Designated Load (TMDL) regulations proposed by the Oregon Department of Environmental Quality (DEQ) need to be deleted or at least redeveloped and rewritten in acknowledgement of the adverse environmental and adverse public health consequences that will occur if they are adopted and implemented as proposed. The redeveloped TMDL needs to focus on the actual and known sources of mercury.

If atmospheric deposition of Mercury is truly occurring, then the soils would indicate the presence of Mercury. A review of ODEQ data does not indicate any collection and measurement of soil samples for mercury.

Therefore, without any data, the hypothesis by the ODEQ that the larger source of mercury is coming from the air and being deposited in the soil and vegetation is false and unproven. In fact, the source of mercury which in the past has been claimed by ODEQ to be from oversees can be proven that it would actually drop out by atmospheric deposition well before it reached Oregon. Since the soils do not indicate the presence of mercury, then mercury is not present, and the DEQ program based on controlling mercury originating from atmospheric deposition is incorrect. The sad thing is that DEQs proposed TMDL program is based on the false premise that about 90% of the source of mercury is coming from the atmosphere.

Response: Commenter is referred to Sections 5.3.1 and 5.3.2 of the TMDL Technical Support Document for discussions of atmospheric deposition and estimating mercury in soil matrix. These discussions include the studies, data and modeling relied on for conclusions about the dominance of air deposition as a source of mercury in the Willamette Basin. As noted in Section 5.5 of the TMDL Technical Support Document and Sections 9.1.2 and 14.2 of the TMDL, these conclusions are corroborated by multiple regional, national and global studies, as well as guidance developed by EPA specific to developing TMDLs when the dominant source of mercury is air deposition. If commenter has additional information on measurement of mercury in soils, DEQ would appreciate obtaining a copy for possible use during implementation, monitoring and assessment.

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31. Comments from: Nicholas, Brian of Marion County Public Works

N_B#1: Suggested Change ID #113

Description: General- Lack of County represented participation on advisory committee

Comment: Lack of County Represented Participation

Counties were disappointed to find that the Mercury TMDL technical advisory committee included participants from many organizations and trades but it did not include anyone with experience at a County level. With such a substantial impact to counties, having county governments at the table would have helped to provide a more implementable document. Instead, we are concerned that the proposed standards include a number of elements that will place overwhelming demands on our already limited resources with no measurable improvement to Mercury reduction within the Willamette basin.

Response: DEQ acknowledges your comment. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. DEQ established a 25-member Advisory Committee with representation by stakeholders from both point and nonpoint source entities that met over a two year period. All meetings were announced and open to the public. Although counties were not specifically on the advisory committee, DEQ did, in fact, make revisions to the WQMP based on county comments received during the public comment period. After careful consideration of the concerns a number of counties raised, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. DEQ believes this is a "right-sized" approach for reducing mercury and sediment contributions from county lands and properties. Counties also have up to 4 1/2 years to fully implement all required components of the management program.

DEQ basin coordinators will be working closely with cities and counties as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

N_B#2: Suggested Change ID #115

Description: WQMP - Stormwater - impact to county staff time

Comment: Section 13.3.1.11 Local Government: Cities and Counties

One of our most significant concerns with the TMDL is the extension of the six minimum stormwater control measures to county areas outside of those already covered by our MS4 Phase II NPDES permit. This requirement would be a significant impact to most counties. The six minimum control measures were originally designed to be implemented within urbanized areas not in rural, less densely populated areas such as where Marion County's TMDLs would take effect. Due to the geographic range covered by county boundaries, implementing these requirements would take significant time and resources without a clear benefit to water quality. County staff could be required to travel as far as 60 miles (about one hour each way) to visit sites implementing these minimum measures.

The increased level of implementation (financial, political, technical) as laid out in the Draft Mercury TMDL creates an unacceptable cost/benefit imbalance. This is especially true as a rural area management DMA (Linn County), with a de minimis effect on mercury. The necessity of creating new staff positions, reporting mechanisms, field review, and enforcement is a financial impact on the County that is not going to change mercury levels. Linn County (and also Washington County) is concerned regarding application

of an Illicit Discharge & Detection Elimination program regarding mercury loading for the rural area. This program and EPA guidance targets industrial, commercial, residential urban, and municipal activities such as landfills, fleet storage, etc. Our biggest concern is the cost of an outfall field survey over 2,297 square miles of rural valley, hills, and mountains — which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Again, we are talking about controlling less than 1% of the Mercury in the form of uncontaminated sediment while there are not any proposed controls for 99% of the problem as proposed by the DEQ. Why is that happening?

[Similar language from Washington County]: Our biggest concern is the cost of an outfall field survey over 712 square miles of rural hills – which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Note that DEQ is not requiring an outfall field survey as part of the core management program.

N_B#3: Suggested Change ID #116

Description: WQMP - Stormwater MS4 - Post-construction requirements effecting Private Development and Community Planning

Comment: Private Development and Community Planning

Marion County finds the proposed post-construction measures to be problematic as the perceived intent is to implement post-construction requirements throughout all areas of the County, including just outside of smaller cities (under 5,000 population), which have no post-construction requirements. This will yield unintended consequences like disjointed community development and planning as well as increased cost of housing in rural and unincorporated areas.

Response: Based on public comment, DEQ revised requirements for counties, which included removal of post-construction requirements. DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. DEQ also included in the WQMP example BMPs for counties to implement, such as onsite stormwater management on county-owned lands for existing properties, new development and redevelopment.

N_B#4: Suggested Change ID #118

Description: WQMP - Stormwater - illicit discharge and agricultural issues

Comment: Illicit Discharge Detection and Elimination

The proposed illicit discharge control measure requires the County to develop an illicit discharge program county-wide, including in rural and largely isolated areas of the County. In our experience the majority of illicit discharge notifications in these areas have been related to agricultural properties and are referred to the Oregon Department of Agriculture. We find it problematic that we might be expending limited resources to document and investigate issues that Marion County is unable to enforce. The proposed illicit discharge control measure will increase administrative costs, will require more staff time to manage, and will ultimately frustrate the public if immediate action cannot be taken.

Response: Based on public comment, DEQ revised requirements for counties, which included removal of an illicit discharge and detection elimination program. DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

One of the core management programs includes an enforcement mechanism. Counties must implement a program to reduce conveyance of mercury and mercury-related pollutants to waterbodies from county lands and properties, and to have enforcement capability for entities contributing mercury-related pollutants, such as sediment, to county property and assets. DEQ recognizes that county ordinances already in place or that must be adopted would likely be more comprehensive and prohibit discharges of other pollutants, rather than only those pollutants associated with mercury. The program must also maintain a procedure or system to document all complaints or reports. DEQ is allowing counties up to three years to develop the enforcement program.

N_B#5: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures - rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge

programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

N_B#6: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e. 0.5 acre or

0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

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32. Comments from: Jordan, Michael of Bureau of Environmental Services, City of Portland

J_M#1: Suggested Change ID #120

Description: Allocations - Table 10-1 - source sector clarifications needed

Comment: Allocation Table (Section 10, Table 10-1, p62)

Please clarify information in Table 10-1, particularly regarding source sectors and associated allocations. Some sectors are repeated with conflicting allocations, making it difficult to understand how each sector is defined and what the requirements are. For example, Non-Permitted Urban Stormwater is included both as its own sector and with the "general nonpoint source" sector with allocations of 75% and 88% reductions, respectively.

This should be revised to reflect the 75% reduction being sought from this sector. Similarly, atmospheric deposition is specified as both an 88% reduction and an 11% reduction.

Page 62. Table10-1 is confusing because it indicates general nonpoint source and background captures non-permitted urban stormwater and atmospheric deposition, then lists these two sources separately. While they are unified for existing loads, they are listed separately for allocations. This could be displayed more clearly by displaying the source sectors as below or you could add notes to the 75% and 11% required reductions. (EPA comment #15)

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. For clarity, particularly with regard to implementation, DEQ used different terminology for labeling source categories in the TMDL and WQMP than was used for labeling source categories in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. No sector is assigned more than one allocation, as summarized in the revised Table 10-1.

J_M#2: Suggested Change ID #125

Description: WQMP - MS4 effectiveness evaluation

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117) In the second sub-bullet, please remove the term "monitoring" and replace with "evaluation" to allow both qualitative and quantitative methods for evaluating control measure effectiveness.

The second sub-bullet, beginning, "An effectiveness monitoring strategy…" should instead require a strategy for evaluating the effectiveness of control measures. The use of the term "monitoring" could be interpreted to require only water quality monitoring, which is not necessary the most effective way to evaluate the effectiveness of control measures, which are predominantly Best Management Practices. Requiring evaluation of effectiveness allows more flexibility across the range of control measures.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language.

J_M#3: Suggested Change ID #126

Description: WQMP - Stormwater - MS4 implementation progress

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117)

Continued implementation of the actions described in the stormwater management plan that are effective for mercury reduction, along with documentation in each subsequent annual report (beginning with the third year annual report) of implementation progress.

Please remove the words "beginning with the third year annual report" as shown in the above bullet. We are already implementing these actions and reporting on them in our MS4 annual reports.

Submittal of monitoring data in the appropriate DEQ data submission template, pollutant load reduction evaluation and wasteload allocation attainment analysis.

The PLRE and the WAA are existing requirements of the MS4 Phase I permits and should be addressed as noted previously. Please remove the PLRE and WAA references from this bullet.

Response: DEQ did not make the requested changes to Section 13.3.2.2.1. As indicated by the requirement for "continued implementation of actions described in the stormwater management plan," DEQ acknowledges that MS4 Phase I permittees are already implementing some measures that are effective for mercury reduction. The intent of the requirement is to roll in information specific to mercury reduction and potentially additional measures, as warranted, and to give a specific time frame for when mercury-specific reporting must begin. DEQ agrees that submittal of Pollutant Load Reduction Evaluations and Wasteload Attainment Analyses are already required, as well as submittal of data. DEQ clarified that mercury specific information must now be included in these submittals.

J_M#4: Suggested Change ID #127

Description: WQMP - MS4 evaluations of effectiveness

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117)

An analysis of the effectiveness of the actions taken and qualitative pollutant load reductions achieved in the fourth annual report. Due to data limitations, the wasteload allocation attainment analysis, pollutant load reduction evaluation, and benchmarks for mercury are not applicable in the first permit cycle after the TMDL is finalized.

It's unclear how the first statement in this requirement substantively differs from the requirement described under the first bullet to "evaluate current actions and their relative effectiveness." Please clarify or remove this duplicative requirement. Also, please adjust the second statement as noted for further clarification.

Response: DEQ made changes to clarify the requirements for MS4 permittees. DEQ did not make the requested changes to the statement "due to data limitations, mercury benchmarks are not applicable in the first permit cycle after the TMDL is finalized." The statement acknowledges that initial data sets are inadequate for developing mercury benchmarks. However, qualitative evaluation, as required for non-structural controls, is expected in reporting of pollutant load reduction evaluations and wasteload attainment analyses.

J_M#5: Suggested Change ID #128

Description: Modeling - 1200-Z permit data should be used in modeling and reduced TSS benchmarks should be implemented in the 1200Z permit statewide

Comment: Industrial Stormwater Sector (Section 9.4.2 & 13.3.2.2.2)

TMDL Text: The potential contributions of atmospherically-deposited mercury from stormwater managed through all of the general stormwater permits covering industrial and construction activities … were implicit within these modeled loads from urban stormwater runoff (p58) … mercury reductions achieved through current and future general stormwater permit requirements for permitted activities conducted within the MS4-permitted jurisdictions will contribute to the aggregate stormwater sector reductions needed to achieve the wasteload allocation. (p118)

Comment: The City strongly disagrees with DEQ's decision to not explicitly model industrial stormwater as a unique source sector or require any new mercury or sediment controls in the 1200-Z general stormwater permit. The industrial stormwater sector and certain industry types in particular present unique sources of mercury that warrant a wasteload allocation and associated controls. Since 2012, DEQ has required mercury monitoring in the 1200-Z permit as both a sector-specific and an impairment pollutant, so a robust data source was available for DEQ's development of the TMDL. A brief analysis of industrial stormwater runoff data from 1200-Z and 1200-COLS sites in Portland showed an average mercury result of 94 ng/L for waste-related industrial facilities (facilities with SIC codes 5015, 5093, and 4953 or used motor vehicle parts/auto salvage, scrap and waste materials, and refuse systems, respectively). The analysis showed an average mercury result of 65.4 ng/L for all other industrial facilities. DEQ is not requiring any additional controls or management strategies for this source sector and is instead relying on existing 1200-Z benchmarks for total suspended solids (TSS). DEQ defends this approach by stating "The 1200-Z permit includes a reduced benchmark for total suspended solids for discharges into the geographic regions of the Portland Harbor (approximately the lowest 10 miles of the

Willamette River) and the Columbia Slough." According to the WQMP, there are currently 629 1200-Z registrants in the Willamette Basin. Please note that over 400 of these permit registrants are not located in the Columbia Slough/Portland Harbor region. Therefore, most existing industrial facilities will continue to be allowed to discharge TSS at unacceptably high levels throughout the basin as the Willamette flows into Portland. Please consider additional controls and/or a reduced TSS benchmark in the 1200-Z permit basin wide.

Response: DEQ clarifies that EPA's contractor, Tetra Tech, undertook the modeling for TMDL development and used only the MS4 stormwater data and jurisdictional land areas in estimating loads from stormwater from permitted and unpermitted urban areas. DEQ supported the reasonable assumption that general stormwater permit discharges be considered implicit in these load estimates for several reasons: • the overall contributions from stormwater comprise only about 3% of the total loads in the basin; • the majority of permitted industrial and construction stormwater discharges occur within MS4 systems; and • contributing land areas from 1200-Z general permit facilities are small in comparison to MS4 jurisdictions, which is important in considering that air deposition is the primary source of mercury in the basin, with loads in stormwater then driven by land areas generating stormwater.

In addition, DEQ analyzed the available mercury and TSS data from 1200-Z permit registrants and did not find justification for asserting additional requirements for 1200-Z permit registrants within the Willamette Basin or statewide, as requested in the comment. The goals of DEQ's evaluation were to establish TSS as a potential surrogate for mercury and as another line of evidence in determining loads and sources of mercury specific to industrial stormwater discharges. DEQ found the data set was sparse and contained over 50 percent non-detect results due to method detection limits. DEQ is not proposing additional requirements on the 1200-Z permit to implement the aggregated stormwater sector wasteload allocation at this time. However, if warranted by additional data collection and evaluation during implementation of the TMDL Monitoring and Evaluation Strategy, DEQ will consider additional requirements in future permit cycles.

J_M#6: Suggested Change ID #129

Description: WQMP - Stormwater - requirements for current MS4 permit holders

Comment: Nonpoint source stormwater management requirements for MS4 Permit holders (Section 13.3.1.11.1) TMDL Text: As DMAs for nonpoint sources of mercury, MS4 permit holders must also implement the six stormwater control measures, as described in Table 13-10, in their jurisdictional areas outside of the urbanized area covered by their permit. (p96)

Comment: The application of the MS4 six minimum measures in non-MS4 areas is problematic, particularly in Portland which has a combined sewer area that is already covered as a separate source in the TMDL and has a large area served by Underground Injection Controls (UICs), which is regulated by the Safe Drinking Water Act and covered by the City's Water Pollution Control Facility (WPCF) UIC permit. Please clarify that DEQ's intention for these non-MS4 areas is to rely on existing regulatory mechanisms and not the six minimum MS4 measures. Please clarify further that the education and outreach effectiveness evaluation listed in Table 13-10 does not apply to existing MS4 Phase I permit registrants, as it is not a requirement in Section 13.3.2.2.1 of the WQMP and Phase I communities are already conducting education activities as required by the MS4 permit. Furthermore, the City is concerned that DEQ's broad-brush approach with the six minimum measures takes limited DMA and DEQ resources away from more important priorities. The rationale for such an approach was not adequately addressed in the TMDL, as it was not demonstrated how each of the six measures will actually contribute

to reductions of mercury. The Illicit Discharge Detection and Elimination (IDDE) requirement, for example, will require tremendous resources for parties to implement with little to no effect on mercury sources, while the focus should be on erosion control.

Response: DEQ agrees with several of the comments and revised Section 13.3.1.11 in the WQMP to address needed clarifications. DEQ clarified that existing regulations related to water quality protection, such as permits associated with the Underground Injection Program to protect discharges to groundwater, will not be replaced by stormwater control measures because discharges from these areas do not go to surface water. DMAs should contact DEQ if they have questions about the applicability of required stormwater control measures in areas where other related regulations exist.

The six stormwater control measures have long been recognized by EPA and others as an effective approach in reducing pollutants from urban runoff. The control measures were not intended to address any one pollutant, but rather many pollutants found in urban stormwater, including sediment and mercury. In keeping with EPA Guidance cited in the TMDL/WQMP, implementation of wasteload allocations in stormwater permits are typically expressed in the form of best management practices. DEQ's analysis indicated that mercury is present in all land uses, including urban areas, and can be transported to waterbodies either through runoff or attached to sediment. Furthermore, many cities are already familiar with these stormwater control measures and will be able to use their extensive experience in evaluating effective urban BMPs and practices to control erosion and runoff. Note that DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

In addition, DEQ anticipates that extending the six stormwater control measures outside a city's MS4 permit area, but still within a city's jurisdiction will not be insurmountable. This "implementation gap" is likely small for most cities, some of which are already applying some of the stormwater control measures to these areas. While the six minimum stormwater measures in Table 13.10 are less prescriptive than MS4 permit requirements, MS4 permit holders may choose to implement requirements under their permit within and outside the urbanized area of their permit for implementation consistency. This approach would either meet or exceed the requirements in Table 13.10.

Finally, it is not DEQ's intention to duplicate any existing efforts of DMAs, including its public outreach and education program. To avoid any confusion, DEQ revised language in the public and education program component in Table 13.10 to clarify that DMAs must perform a qualitative assessment of at least one education and outreach component as part of TMDL annual reporting. This qualitative assessment is not the same as the requirement in the Phase I MS4 permit to conduct a comprehensive effectiveness evaluation. DEQ anticipates that MS4 permit holders would continue applying their public outreach and education programs to these "implementation gap" areas outside their permit coverage using approaches already gleaned from the effectiveness evaluation.

J_M#7: Suggested Change ID #130

Description: Monitoring and evaluation - request for future stakeholder involvement

Comment: Monitoring and Evaluation (Section 13.6, p124)

TMDL Text: "DEQ and EPA are currently developing an Assessment and Monitoring Strategy to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin."

Comments: We request that this Assessment and Monitoring Strategy include stakeholder involvement or, at a minimum, be made available for public comment and/or DMA input prior to implementation. This would be beneficial given stakeholder previous experience with monitoring and the potential for significant resource implications.

Response: DEQ is committed to public, stakeholder, and DMA engagement in the development of the Assessment and Monitoring Strategy.

J_M#8: Suggested Change ID #131

Description: WLA - 10% reduction clarification

Comment: Allocations (Table 10-1, p62) and NPDES Wastewater Permits (Section 13.3.2.1)

TMDL Text: Permit categories under the aggregate 10 percent reduction wasteload allocation include: major and minor domestic sewage treatment plant permits; major and minor industrial wastewater permits; and wastewater discharges covered under non-stormwater general permits. (p113). DEQ determined that the potential mercury load from minor STP discharges is an insignificant contribution to the estimated 0.8 percent of total mercury load from all STPs within the basin. Therefore, no additional controls or monitoring will be required from minor STPs toward achieving the 10 percent overall wastewater sector reduction of 0.44 g/day or 0.16 kg/yr (p114).

Comment: Table 10-1 and Section 13.3.2.1 describe the percent reduction required by municipal wastewater point source dischargers, but make unclear or conflicting statements as to whether the 10% reduction applies only to major municipal NPDES dischargers or to both major and minor dischargers. The tables and text should be clarified so that it is understood that only major municipal NPDES dischargers are subject to the 10% reduction requirement.

Response: As noted in Section 13.3.2.1, permit categories under the aggregate 10% reduction wasteload allocation for the wastewater sector include: major and minor domestic sewage treatment plant permits; major and minor industrial wastewater permits; and wastewater discharges covered under non-stormwater general permits." The subsections go on to specify requirements for major STPs, select major and minor industrial facilities and 700PM general permit registrants, in order to achieve the overall sector reduction. DEQ clarifies that the allocation applies to the entire sector, but additional requirements currently only apply to some permits within the sector. While it is unlikely to be necessary, DEQ may apply additional requirements to additional permits within the sector, as warranted by periodic evaluations, in order to adaptively manage achievement of the allocation over time.

J_M#9: Suggested Change ID #132

Description: Table 5-9 - review data

Comment: Draft Technical Support Document - Average POTW Mercury Concentrations (Table 5-9, p89)

Table 5-9 specifies an average mercury concentration of 14.1 ng/L for the City of Portland Tryon Creek facility. The City notes that the data provided to DEQ to calculate this average consisted predominantly of

data from 2004 which was prior to upgrading the TCWTP aeration basins and that the dataset contained one extreme outlier from 2010, which biased the mean high. The City recommends that DEQ use the median concentration as a more accurate representation of effluent concentrations for all facilities.

Response: Data used in the revised Willamette TMDL covers the period 2002-2017, with the majority of fish tissue data collected in or before 2011. It is desirable to use information on POTWs covering a comparable time period to make the loading analysis consistent with the fish tissue analysis. However, DEQ does recognize that total mercury concentrations in the Portland Tryon Creek POTW may have declined after 2004 due to process improvements - although only 11 out of 66 samples are from later than 2004. It also appears that the average concentration assigned to this facility may be biased high due to the presence of one high outlier (reported as 178 µg/L on 8/4/2010). Whether this observation is valid or represents a data entry error is unknown to DEQ.

DEQ appreciates the suggestion that the median might provide a more robust basis for estimating loads in this case; however, we used averages for all other point sources - in part because the distributions may be skewed with occasional high measurements - and do not feel it would be proper to modify this a priori approach for a single permittee. The median of the observations is 9.75 ng/L, vs. the average of 14.12. The median through 2004 is 11 ng/L, while the median of observations after 2004 is 4.9 ng/L.

While no changes to the TMDL or TSD are recommended on the basis of this comment, DEQ acknowledges that facilities have differing levels of maturity of mercury minimization programs and some facilities that have applied strategies to reduce mercury loads from those represented in the TMDL assessment. This will be taken into consideration during TMDL implementation.

J_M#10: Suggested Change ID #133

Description: Modeling - clarify inputs, CSO

Comment: Draft Technical Support Document Combined Sewer Areas

CSOs are predominantly composed of stormwater and THg loads associated with CSOs are considered to be already represented by estimates of THg load associated with urban stormwater. (p106) Clarification is needed as to whether and how contributions from CSOs were included in mercury loading calculations, and what “urban stormwater load” is being referenced in the text? Urban stormwater from outside of the CSO area, or urban stormwater from the CSO area? This clarification would provide a better understanding of modelling inputs to stormwater loads as well as aid in evaluating the effectiveness of the City’s mercury minimization efforts managed under the MS4, NPDES wastewater, and UIC permits.

Response: The text regarding CSOs on page 104 of the Technical Support Document was clarified. Only the City of Portland provided boundaries of the combined sewer drainage areas, therefore only City of Portland CSO areas were removed from the area tabulated for MS4 loads at this time. CSOs during wet weather events are predominantly composed of stormwater, so total mercury loads associated with these CSOs are represented by estimates of total mercury loads associated with urban stormwater.

For the City of Portland, areas in the combined sewer drainage area were excluded from the MS4 load estimate. It was subsequently determined that the surface load from this area was instead incorrectly tabulated as part of the developed non-MS4 total mercury load for this HUC, leading to a minor over-estimation of the non-MS4 urban stormwater load (for the Portland area only). The change in load delivered to the outlet of HUC 17090012 was less than 1% with the removal of the surface load from

identified combined sewer areas. Nevertheless, this portion of the load was removed from the final tabulations.

For CSO communities other than Portland, the diversion of total mercury loads to wastewater treatment plants in combined sewer areas cannot currently be accounted for as the combined sewer drainage areas were not provided. For these cities there is thus a small over-estimation of the MS4 total mercury load that could be accounted as part of the progress toward reaching the MS4 reduction target, if an analysis of the fraction of urban runoff entering the combined sewer system is evaluated.

J_M#11: Suggested Change ID #244

Description: WQMP - MS4 submittals - do not require multiple submittals of SWMP to address mercury

Comment: 9. Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System: This section requires the inclusion of specified terms in MS4 Phase I permits upon renewal to implement the TMDL. The first bullet requires a mercury minimization section within the "Stormwater Management strategy." Presumably this refers to the permittee's Stormwater Management Plan (SWMP), not a separate document. Given the comprehensive nature of SWMPs, a second, redundant document should not be required. This section should be clear that it refers to the SWMP.

Including new requirements to create a separate mercury plan/update of the existing Stormwater Management Plan outside of the typical permit renewal cycle is an inefficient use of already limited time for both MS4 and DEQ staff and serves no environmental benefit, as DEQ already has copies of our documents. We request that DEQ use the same permit renewal and reporting cycle required for the MS4 permit be utilized for any language updates needed to specifically satisfy the Mercury Water Quality Management Plan, as we do not see new or additional information that we have/can provide beyond what is extensively documented and reported to DEQ annually.

It's unclear if the "mercury minimization section" referenced here is intended to be a stand-alone submittal, part of an annual report, or a Stormwater Management Plan (SWMP) revision. The latter is inappropriate. A new SWMP is generally required upon re-issuance of the MS4 permit, so this provision as written would force permittees to revise their SWMPs within two years of having drafted an entirely new SWMP, which is a very resource-intensive process and technically constitutes a permit modification. The SWMP comprehensively addresses all pollutants associated with stormwater runoff (including and especially sediment), so creating a duplicative or obsolete section within the SWMP that repeats all the existing pollution reduction strategies simply is not useful. Please modify language in the first bullet as noted to clarify this as a stand-alone submittal along with, or as part of, the second annual report.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language in Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System.

J_M#12: Suggested Change ID #331

Description: WQMP - Section 13.4.1 Implementation Plan Timeline Coordination

Comment: As part of the Willamette River Basin TMDL five-year review, implementation plans were recently updated and submitted to DEQ in late 2018 and early 2019. Please consider lining up the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance.

Align the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance. Allow an additional time frame for county implementation of six minimum measures in Table 13-11 due to expansive geographies and overlapping jurisdictions.

Implementation plans (Section 13.1.1)

TMDL Text: DEQ typically gives DMAs and responsible persons 18 months to submit new or updated implementation plans following the issuance of a TMDL and WQMP. For this WQMP, DEQ will continue using the 18-month time frame for implementation plan submittal. For point sources, wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. (p. 73-74) MS4 permit holders must also develop and submit a TMDL implementation plan that demonstrates how nonpoint source load allocations will be met. This plan must include management strategies to reduce runoff and erosion that discharge directly to waterbodies. (p97)

Comment: Clarification is needed around these statements and associated requirements. The City and others just submitted updated TMDL Implementation Plans as required by DEQ following the recent 5-year review. Portland's implementation plan (dated March 1, 2019) already covers mercury and describes strategies that the City is using to address this and other TMDL pollutants. Will the City be required to re-submit this plan in 18 months? Please clarify or amend the requirement to make an exception for DMAs that already have TMDL Implementation Plans that address mercury.

Response: DEQ agrees that keeping the five year reporting cycle consistent between the Willamette Basin TMDLs will be more efficient. The last five year review for the Willamette Basin occurred in 2018. The next five-year review will occur in 2023 and will include implementation activities related to the 2019 Mercury TMDL. In other words, the next five-year review will include information about mercury-related strategies that some DMAs started implementing in the middle of their current five year cycle. The objective of this timeline is to retain a consistent five-year reporting cycle for current and future Willamette Basin TMDLs. Some designated management will continue to have alternate five year cycles based on previous implementation and reporting schedules, for example DMAs in the Molalla-Pudding subbasin.

Following the issuance of the mercury TMDL, updated TMDL implementation plans to meet the WQMP will be due within 18 months (i.e. around May 2021 if TMDL approved by end of November 2019). DEQ basin coordinators will review and approve updated implementation plans to ensure plans meet requirements in the revised mercury WQMP. Depending on the content of the implementation plan, some DMAs may already meet requirements, while others will not. It is likely that DMAs will need to make some updates to align with the WQMP, including development of measurable objectives if absent. The implementation plan may also need language to clarify how a DMA's existing MS4 or other program meets the WQMP.

33. Comments from: Warren, Jeff

W_J#1: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

W_J#2: Suggested Change ID #41

Description: General - comment period too short

Comment: NA

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe required in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

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34. Comments from: O'Brien, Dan of Greenberry Irrigation District

OB#1: Suggested Change ID #322

Description: WQMP - Water Conveyance - Greenberry

Comment: Do not burden Greenberry Irrigation District with unnecessary regulatory monitoring or reporting because the District poses a very minor threat of impacting a TMDL.

Response: All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system.

The monitoring framework for this TMDL will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this framework will help DEQ characterize water quality trends within HUC8 watersheds. DEQ will work with watershed partners to implement monitoring, but water conveyance entities named as responsible persons will not be required to monitor water quality at this time.

Responsible persons are required to monitor implementation of best management practices that reduce sediment movement and erosion. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time that could be caused by human sources, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading from associated with that DMA or responsible person.

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35. Comments from: Smeltzer, Odessa

S_O#1: Suggested Change ID #4

Description: WLA - 700PM - presence of mercury in streams not proven and suction miners don't use mercury to recover gold

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because DEQ hasn't proven there is measurable mercury in the streams and suction miners do not use mercury to recover gold

Response: As noted in the TMDL, mercury was measured in stream sediment in Brice Creek, Champion Creek, Sharps Creek and the Row River ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). In contrast, the same study found that sediment in streams above the Bohemia Mining District areas average 0.07 mg/kg of mercury. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies

such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

S_O#2: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

S_O#3: Suggested Change ID #41

Description: General - comment period too short

Comment: NA

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe required in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

S_O#4: Suggested Change ID #43

Description: WLA - 700PM - studies are biased due to funding by environmental groups

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because these restrictions are unfounded and based on biased studies funded by environmental groups.

Response: In evaluating the potential for mercury in stream sediment to be transformed, mobilized and methylated, DEQ relied on all available studies published in peer-reviewed literature.

S_O#5: Suggested Change ID #44

Description: General - DEQ did not include miners in the decision making process

Comment: NA

Response: DEQ does not agree that miners did not have opportunity to participate in the TMDL process. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. A 25-member Advisory Committee was established with representation by stakeholders from both point sources and nonpoint sources that met 2 years and for which all meetings were publicized and open to the public. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. All affected parties were also invited to review materials, contact DEQ staff with questions and provide comments at a public hearing, held at two locations spanning the Willamette Basin, and throughout a 66 day public comment period.

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36. Comments from: Quintal, Tom of Willamette Valley Miners Association

Q_TW#1: Suggested Change ID #11

Description: WLA - 700PM - ocean fish methylmercury type is less toxic than the form fish consumption advisory is based on and may be moderated by selenium

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because methyl mercury cysteine is found in seafood and may be less toxic than the mercury form fish consumption advisories are based on and may be moderated by high selenium content in ocean fish and eating seafood is healthy

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority, the agency that sets fish consumption advisories for the state. One purpose of the TMDL is to be protective of freshwater fish

species within the Willamette Basin, not be protective of ocean/saltwater fish. While there are studies of selenium content in ocean fish and western US stream fish potentially having a moderating effect on mercury in fish tissue, selenium levels in the Willamette Basin streams are not very high and there is not evidence to suggest that the selenium is offsetting the toxicity of methylmercury within the basin. DEQ's TMDL does not affect Oregon Health Authority's fish consumption advisories. Rather, the TMDL is proposed to help reduce mercury in fish tissue over time, with the eventual goal of allowing all beneficial uses, including unrestricted fish consumption.

Q_TW#2: Suggested Change ID #40

Description: WLA - 700PM - DEQ has not considered the Joe Greene and Claudia Wise dredging study

Comment: NA

Response: DEQ searched for peer reviewed, published studies by Joe Greene and Claudia Wise and could not find any. DEQ did find a PowerPoint by Greene and Wise as well as testimony by the pair on permit actions in Washington. However, the studies referenced were the same ones as those in DEQ's TMDL, and no additional information refuting DEQ's interpretation of those studies was offered. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

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37. Comments from: Webb, Tasha Lee

W_TL#1: Suggested Change ID #7

Description: WLA - 700PM - suction mining removes mercury and no studies show a rise of mercury in fish after dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining can remove mercury from streams and there is no data showing a rise in mercury in fish after dredging has occurred.

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times

higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

W_TL#2: Suggested Change ID #18

Description: WLA - 700PM - dredging only allowed for a few weeks per year with turbidity limits so mercury impacts are low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because due to ODFW in water work windows, miners can only work in streams for a few weeks a year when water and sediment flows are low and can only make turbidity for 300 feet, so suction dredges causing mercury in streams is not a big issue.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

W_TL#3: Suggested Change ID #21

Description: WLA - 700PM - suction mining is not the source of mercury and mercury contribution from suction mining is low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ's studies show mining is only 1% of the mercury load for the Willamette Basin, so mining is not a mercury issue. This TMDL proposal unfairly burdens suction dredge miners as point-source polluters when they are not the source of the mercury. Abandoned mines on federal land are responsible.

Response: DEQ clarifies that the TMDL modeling indicates that all permitted wastewater point source discharges contribute approximately one percent of the mercury load within the Willamette Basin. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the

entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. Finally, DEQ's TMDL also requires reduction of mercury by 95% from legacy mine-related sources, with the federal agencies as designated management agencies responsible for implementation.

W_TL#4: Suggested Change ID #22

Description: WLA - 700PM - no 303(d) listings in Bohemia streams because suction dredging is the only way to remove mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ should not 303(d) list the streams in the Bohemia Mining District because suction mining is the only way to remove mercury from this environment. No one else will remove mercury from streams and it will eventually migrate down to where it will be converted into methylmercury.

Response: DEQ clarifies that streams in the Bohemia Mining District are not currently proposed for inclusion on the 303(d) list of waters impaired by mercury. DEQ agrees that miners sometimes find and remove elemental mercury during suction dredge mining and that mercury currently in tributaries to Dorena Reservoir could migrate downstream to areas where methylation can occur. As noted in section 9.2.3 of the draft TMDL, the streams and upland areas within the Bohemia Mining District that are known to be contaminated with mercury due to historical mining activities are on the list of Abandoned Mine Lands sites being tracked, investigated and remediated by state and federal agencies. In the meantime, the TMDL prohibits suction dredge mining within mercury contaminated tributaries to Dorena Reservoir because the studies referenced in the TMDL show that suction dredge mining can uncover, transform, transport and increase methylation potential of mercury in stream sediment and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury.

W_TL#5: Suggested Change ID #27

Description: WLA - 700PM - TMDL proposes leaving mercury in streams rather than allowing impacts during suction mining which removes mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ staff are idiots or have an anti-mining agenda to propose leaving 100% of mercury and lead in streams rather than risk reintroduction of 2% during removal of 98% with free suction dredging.

Response: DEQ clarifies that the study referenced in the TMDL as Humphreys 2005 found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining."

W_TL#6: Suggested Change ID #41

Description: General - comment period too short

Comment: NA

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe required in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

W_TL#7: Suggested Change ID #103

Description: WLA - 700PM - complete reservoir management measures prior to prohibiting suction dredge mining in tributaries to Dorena Reservoir

Comment: Suction dredge miners may be able to improve methods of capturing mercury and mitigating mercury mobilization

Response: The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. Mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging

from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

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38. Comments from: Stockhoff, Gary of Benton County

S_G#1: Suggested Change ID #113

Description: General- Lack of County represented participation on advisory committee

Comment: Lack of County Represented Participation

Counties were disappointed to find that the Mercury TMDL technical advisory committee included participants from many organizations and trades but it did not include anyone with experience at a County level. With such a substantial impact to counties, having county governments at the table would have helped to provide a more implementable document. Instead, we are concerned that the proposed standards include a number of elements that will place overwhelming demands on our already limited resources with no measurable improvement to Mercury reduction within the Willamette basin.

Response: DEQ acknowledges your comment. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. DEQ established a 25-member Advisory Committee with representation by stakeholders from both point and nonpoint source entities that met over a two year period. All meetings were announced and open to the public. Although counties were not specifically on the advisory committee, DEQ did, in fact, make revisions to the WQMP based on county comments received during the public comment period. After careful consideration of the concerns a number of counties raised, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. DEQ believes this is a “right-sized” approach for reducing mercury and sediment contributions from county lands and properties. Counties also have up to 4 1/2 years to fully implement all required components of the management program.

DEQ basin coordinators will be working closely with cities and counties as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

S_G#2: Suggested Change ID #115

Description: WQMP - Stormwater - impact to county staff time

Comment: Section 13.3.1.11 Local Government: Cities and Counties

One of our most significant concerns with the TMDL is the extension of the six minimum stormwater control measures to county areas outside of those already covered by our MS4 Phase II NPDES permit. This requirement would be a significant impact to most counties. The six minimum control measures were originally designed to be implemented within urbanized areas not in rural, less densely populated areas such as where Marion County's TMDLs would take effect. Due to the geographic range covered by county boundaries, implementing these requirements would take significant time and resources without a clear benefit to water quality. County staff could be required to travel as far as 60 miles (about one hour each way) to visit sites implementing these minimum measures.

The increased level of implementation (financial, political, technical) as laid out in the Draft Mercury TMDL creates an unacceptable cost/benefit imbalance. This is especially true as a rural area management DMA (Linn County), with a de minimis effect on mercury. The necessity of creating new staff positions, reporting mechanisms, field review, and enforcement is a financial impact on the County that is not going to change mercury levels. Linn County (and also Washington County) is concerned regarding application of an Illicit Discharge & Detection Elimination program regarding mercury loading for the rural area. This program and EPA guidance targets industrial, commercial, residential urban, and municipal activities such as landfills, fleet storage, etc. Our biggest concern is the cost of an outfall field survey over 2,297 square miles of rural valley, hills, and mountains — which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Again, we are talking about controlling less than 1% of the Mercury in the form of uncontaminated sediment while there are not any proposed controls for 99% of the problem as proposed by the DEQ. Why is that happening?

[Similar language from Washington County]: Our biggest concern is the cost of an outfall field survey over 712 square miles of rural hills – which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Note that DEQ is not requiring an outfall field survey as part of the core management program.

S_G#3: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures - rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

S_G#4: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and

agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e. 0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these

cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

S_G#5: Suggested Change ID #240

Description: WQMP - Six minimum measures not appropriate for rural areas

Comment: Section 13.3.1.11, Local Government: Cities and Counties. The District has an established working relationship with the City of Gaston (which is within the District's jurisdiction, but outside the MS4) and with Washington County (a co-implementer than also will be responsible for rural areas outside the MS4) that ensures successful cooperation to address water quality in the Tualatin basin. The comments below reflect the District's concern that the WQMP's highly prescriptive requirements will impact that relationship and divert local resources away from programs that have shown demonstrated success. The WQMP's requirement to implement the six minimum measures from the Phase II rule is not appropriate for sparsely populated regions outside of MS4 permitted areas, such as those in rural Washington County. Although much of Washington County and other counties in the basin are densely urban, the area outside the MS4 areas and outside the Urban Growth Boundaries and are distinctly rural, typified by dispersed population in agricultural and predominantly less developed areas. The six minimum measures were developed for urban areas; applying them outside MS4 permitted areas could appear to be an attempt to impose MS4 permit requirements on locations that are neither Phase I nor Phase II communities. A more tailored approach that provides the opportunity for the counties to develop control strategies better designed for the rural areas would be more effective than narrowly construed application of the six minimum control measures. Of particular concern is the specificity of the descriptions in Table 13-10 and the resource demands they will exert. This specificity does not reflect a consideration of local resources and needs, as required by the Maximum Extent Practicable (MEP) standard for municipal stormwater discharges. The MEP standard requires consideration of unique local conditions such as receiving waters, size of the community, fiscal resources, hydrology, geology, and capacity to perform operation and maintenance.

Rather than imposing these requirements on small communities and rural counties, the TMDL should describe the six minimum measures more generally and provide them as potential elements to be considered for inclusion in programs tailored to local needs and capabilities. General descriptions of the six minimum measures should not include thresholds (such as land disturbance area for construction site runoff control or post- construction) or treatment levels (such as TSS removal targets). Program elements such as mapping and inventorying hundreds of miles of roadside ditches as part of an Illicit Discharge Detection and Elimination program may not be a good use of resources. Clearly, should an illicit discharge be identified as a source of mercury, it should be controlled. Similarly, regulation of waste materials at construction sites beyond that regulated by the 1200C permit should be left to the discretion

of the local government in their development of a TMDL implementation plan dependent on the likely source of mercury.

This requirement is especially significant for large counties with broad geographic jurisdiction. Counties covering broad geographic areas will need to coordinate on the six minimum measures within the urban growth boundaries of multiple cities and towns with a range of existing programs (or no programs at all, currently). This presents practical implementation challenges that take time to work through. Also, implementation of the six minimum measures in counties with large geographic areas essentially imposes an urban stormwater management program on largely rurally zoned lands (e.g., rural residential, rural commercial/industrial, etc.). The six minimum measures that are the basis of the MS4 Phase II NPDES permitting program were originally written and intended for managing runoff from urbanized areas. The imposition of these measures in a rural context lacks scientific support and poses a significant risk of unintended consequences and counterproductive actions. We do not think it is appropriate to use the Mercury TMDL as a mechanism for obtaining what is essentially MS4 Phase II NPDES permit coverage watershed wide. Given the largely rural extent of these areas, and the range of actions required to implement the six minimum measures, significant time and resources would be necessary to develop and implement storm water programs for runoff from rural lands without significant impact on or benefits for water quality.

What is the purpose or benefit of extending urban based measures to a rural area? What non-point source would we need to identify? The make-up of Benton County is such that our small staffing levels would be stretched even further as we traverse the county implementing the measures that have very little, if any benefit.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

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39. Comments from: James, Jim of Oregon Small Woodlands Association

J_JO#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

J_JO#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

J_JO#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

J_JO#4: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the

margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

J_JO#5: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

J_JO#6: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

J_JO#7: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell

within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

J_JO#8: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

J_JO#9: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include “an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system.” In addition, modeling to support the TMDL update “must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…” These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ’s mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ’s representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further

analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

J_JO#10: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to gaged flows, the modelers reported that "Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows"; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading. DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially

be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

J_JO#11: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is "estimated to be 361 g/day", a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value "351.42 g/day" for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

J_JO#12: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

J_JO#13: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

J_JO#14: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

J_JO#15: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each

separately. -Providing examples in which “sites”, which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

J_JO#16: Suggested Change ID #230

Description: TSS surrogate model – concentration of THg and TSS

Comment: Please resolve concerns about the quality of this analysis, specifically those related to: -Example 1 in Section 1.5 uses the LME model to indicate that a THg concentration of 0.14 ng/L is predicted by a TSS concentration of 4.272 x 10-14 mg/L. The former is a low but plausible concentration for THg in a river, but the latter is many orders of magnitude lower than the lowest TSS concentration one could ever hope to measure in a large river like the Willamette River. -Example 2 in Section 1.5 uses the LME model to relate a TSS concentration of 100 mg/L, which is high yet reasonable for a large river, to a concentration of THg of 8.38 mg/L, which is implausibly high relative to all observations presented in Table 1 of Appendix H.

Response: The error in the units of TSS given in example 1 was corrected in response to this and other comments. The unit error in total mercury is also present in Example 2. At a TSS concentration of 100 mg/L, the predicted total mercury concentration is 8.38 ng/L, not mg/L. At a TSS concentration 80 mg/L the predicted total mercury concentration is 7.48 ng/L, not mg/L. This unit error does not affect the percent reduction calculation; but was corrected in the revised TMDL/WQMP Appendix H.

J_JO#17: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including “sites” as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A “random effect” is a statistical term for describing a site specific effect on the value of a variable. The term “fixed” effect refers to how the value of a variable changes according changes in the value of

another variable. In the case of the TSS surrogate analysis, the "random effect" is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

J_JO#18: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

J_JO#19: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate "to estimate allocations for pollutants addressed in the TMDL". However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be "used for evaluating effectiveness of the TMDL" because monitoring of "total mercury can be difficult and cost-prohibitive". This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg

measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

J_JO#20: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

J_JO#21: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However,

we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

J_JO#22: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity,

particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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40. Comments from: Walch, Therese of City of Eugene

W_TC#1: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures - rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller

cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

W_TC#2: Suggested Change ID #120

Description: Allocations - Table 10-1 - source sector clarifications needed

Comment: Allocation Table (Section 10, Table 10-1, p62)

Please clarify information in Table 10-1, particularly regarding source sectors and associated allocations. Some sectors are repeated with conflicting allocations, making it difficult to understand how each sector is defined and what the requirements are. For example, Non-Permitted Urban Stormwater is included both as its own sector and with the "general nonpoint source" sector with allocations of 75% and 88% reductions, respectively.

This should be revised to reflect the 75% reduction being sought from this sector. Similarly, atmospheric deposition is specified as both an 88% reduction and an 11% reduction.

Page 62. Table10-1 is confusing because it indicates general nonpoint source and background captures non-permitted urban stormwater and atmospheric deposition, then lists these two sources separately. While they are unified for existing loads, they are listed separately for allocations. This could be displayed more clearly by displaying the source sectors as below or you could add notes to the 75% and 11% required reductions. (EPA comment #15)

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. For clarity, particularly with regard to implementation, DEQ used different terminology for labeling source categories in the TMDL and WQMP than was used for labeling source categories in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric

Deposition are combined, though allocations for the three source categories are assigned separately. No sector is assigned more than one allocation, as summarized in the revised Table 10-1.

W_TC#3: Suggested Change ID #125

Description: WQMP - MS4 effectiveness evaluation

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117) In the second sub-bullet, please remove the term "monitoring" and replace with "evaluation" to allow both qualitative and quantitative methods for evaluating control measure effectiveness.

The second sub-bullet, beginning, "An effectiveness monitoring strategy…" should instead require a strategy for evaluating the effectiveness of control measures. The use of the term "monitoring" could be interpreted to require only water quality monitoring, which is not necessary the most effective way to evaluate the effectiveness of control measures, which are predominantly Best Management Practices. Requiring evaluation of effectiveness allows more flexibility across the range of control measures.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language.

W_TC#4: Suggested Change ID #163

Description: Editorial - Load allocations for nonpoint sources

Comment: Section 10.1 page 65. Text references "the 10 percent reduction for atmospheric sources" in the middle of the first paragraph; however, the allocations show an 11 percent reduction to provide a 1 percent reserve capacity.

Response: DEQ agrees and has made this change.

W_TC#5: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development

process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

W_TC#6: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and

thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would

filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

W_TC#7: Suggested Change ID #237

Description: Allocations - General text revision

Comment: Section 10, Allocations: On page 61 of the TMDL, the next-to-last sentence of the first paragraph states, "The waste load allocations are used to establish effluent limits in discharge permits." Since the TMDL is not suggesting inclusion of numeric effluent limits in permits but rather narrative management practices to implement the wasteload allocations, this sentence should be revised to state that "the implementation strategy associated with the wasteload allocations is incorporated into discharge permits."

Response: DEQ did not make changes to the statement: "The waste load allocations are used to establish effluent limits in discharge permits." While it is true that DEQ is not establishing numeric effluent limits in wastewater permits, once the TMDL is acted on by EPA, DEQ will implement narrative water quality-based effluent limits in permits that are consistent with the assumptions and requirements of the wasteload allocation for the discharge prepared by the State and approved by EPA. This is consistent with the Code of Federal Regulations, EPA guidance and precedent on multiple other states.

W_TC#8: Suggested Change ID #238

Description: Allocations - Table 10-1 PS clarification

Comment: Table 10-1 allocates a 10 percent reduction to NPDES Wastewater Point Source Discharges, but the TMDL applies this reduction only to major municipal NPDES discharges and excludes minor municipal facilities as de minimis and not subject to the 10 percent reduction. Table 10-1 should be explicit that only major municipal NPDES discharges are subject to the 10 percent reduction allocation. It would be helpful to be explicit on permit expectations (even if none) for de minimis sources to limit future confusion related to permit conditions. Also, any clarification of how the reduction would apply if a minor source becomes a major source due to growth or pretreatment would be helpful. Provide a note in Table 10-1 that clarifies the 10% NPDES wastewater point source discharges reduction applies to major municipal NPDES wastewater discharges only because minor municipal facilities are considered de minimis in other sections and not subject to the 10% reduction.

Response: DEQ did not make the requested changes to Table 10-1. The table correctly identifies the sector-specific allocation of a 10% reduction that is aggregated across all permitted wastewater discharges. Section 10.2 further specifies the permits covered under this sector and explains DEQ's rationale for aggregating the allocations, as allowed under the Clean Water Act (per 40 CFR 130.2(i)) and supported in multiple guidance documents and by precedent in multiple approved TMDLs from other states. Section 10.2 goes on to give a brief overview of the wasteload allocation implementation approach and notes that implementation details are specified in the Water Quality Management Plan, which is

found in Section 13 of the TMDL. Section 13.3.2.1.1 provides the explicit information regarding permit requirements by permit type, as requested in the comment. DEQ determined that the WQMP is the appropriate location for such implementation details. Finally, as noted in Sections 13.6 and 14 of the TMDL, DEQ will monitor and evaluate progress toward the goal of attaining mercury water quality standards and intends to adaptively manage progress in attaining those goals, which can over time entail application of additional requirements within sectors, as warranted by evaluation results.

W_TC#9: Suggested Change ID #243

Description: WQMP - Editorial - 13.3.2.1.3 remove permit implementation tools

Comment: 8. Section 13.3.2.1.3, Additional NPDES wastewater permit implementation tools: Since the WQMP does not recommend including effluent limits in NPDES discharge permits, this section on variances and intake credits is not relevant and could lead to confusion. DEQ should remove this section from the final WQMP.

Response: DEQ agrees with the comment and removed Section 13.3.2.1.3.

W_TC#10: Suggested Change ID #244

Description: WQMP - MS4 submittals - do not require multiple submittals of SWMP to address mercury

Comment: 9. Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System: This section requires the inclusion of specified terms in MS4 Phase I permits upon renewal to implement the TMDL. The first bullet requires a mercury minimization section within the "Stormwater Management strategy." Presumably this refers to the permittee's Stormwater Management Plan (SWMP), not a separate document. Given the comprehensive nature of SWMPs, a second, redundant document should not be required. This section should be clear that it refers to the SWMP.

Including new requirements to create a separate mercury plan/update of the existing Stormwater Management Plan outside of the typical permit renewal cycle is an inefficient use of already limited time for both MS4 and DEQ staff and serves no environmental benefit, as DEQ already has copies of our documents. We request that DEQ use the same permit renewal and reporting cycle required for the MS4 permit be utilized for any language updates needed to specifically satisfy the Mercury Water Quality Management Plan, as we do not see new or additional information that we have/can provide beyond what is extensively documented and reported to DEQ annually.

It's unclear if the "mercury minimization section" referenced here is intended to be a stand-alone submittal, part of an annual report, or a Stormwater Management Plan (SWMP) revision. The latter is inappropriate. A new SWMP is generally required upon re-issuance of the MS4 permit, so this provision as written would force permittees to revise their SWMPs within two years of having drafted an entirely new SWMP, which is a very resource-intensive process and technically constitutes a permit modification. The SWMP comprehensively addresses all pollutants associated with stormwater runoff (including and especially sediment), so creating a duplicative or obsolete section within the SWMP that repeats all the existing pollution reduction strategies simply is not useful. Please modify language in the first bullet as noted to clarify this as a stand-alone submittal along with, or as part of, the second annual report.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language in Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System.

W_TC#11: Suggested Change ID #248

Description: Loading Capacity - resurfacing groundwater over daily capacity

Comment: Section 7 on page #43 ("Loading capacity and excess load"): According to the draft TMDL, the river's loading capacity – the amount of mercury the river can receive and still meet water quality standards – is 42 grams/day of total mercury. In table 6-7, "resurfacing groundwater" (springs, for example) is estimated to contribute far more total mercury: 60.6 grams/day. If the estimated amount of mercury discharged by resurfacing groundwater is verified to be correct as additional data is collected in the future, and if the amount of mercury in resurfacing groundwater is naturally occurring, and not the result of human activity, then the river's loading capacity for total mercury will never be met simply due to discharges of mercury in resurfacing groundwater. This would be true even if every property owner, every DMA, and every point source discharger somehow reduce their discharge of mercury to zero. Even if everyone does their part to reduce/control mercury in the future, natural erosion of soils will contribute more mercury, and volcanic eruptions and forest fires will cause even more mercury to be discharged into the river. This apparent fact – that the river's loading capacity for total mercury will probably never be met no matter what the people of Oregon do – should be featured in a more prominent location in the TMDL, including but not limited to the Executive Summary on page #11. Oregonians should all be taking reasonable and cost-effective steps to reduce and control our discharges of mercury, since this will result in better public health and environmental outcomes. But before the TMDL is finalized, acknowledgement of the river's loading capacity and the river's natural sources of mercury should be used by DEQ to set a more realistic, attainable goal in the TMDL for future mercury control and reduction in the watershed.

Currently, there is limited understanding of natural and anthropogenic mercury loads and therefore, the TMDL should be focused on realistic, attainable goals for mercury reduction. For transparency, this inability to attain the mercury loading capacity should be featured in a more prominent location in the TMDL, including in the Executive Summary on page 11 and in Section 14 regarding reasonable assurance.

Response: DEQ acknowledges that natural sources of mercury in the Willamette Basin are a significant portion of the overall loads entering the river system. However, DEQ's expectation is that all relevant management strategies will be applied to the controllable portions of each source toward achieving each responsible entity's portion of the aggregated reductions needed.

W_TC#12: Suggested Change ID #251

Description: WQMP - Urban vs. Rural Streams

Comment: Section 13.3.1.11 Local Government: Urban vs Rural Streams:

In the TMDL, it is important to be clear and consistent when using the terms urban and rural to describe streams and runoff. The draft WQMP incorrectly refers to "urban streams" when it is focused on a discussion of rural areas. And rural stormwater runoff is consistently and incorrectly referred to as urban runoff, and assumed to be of similar quality when data and published reports indicate otherwise.

Response: DEQ agrees that it is important to be consistent with references to urban and rural stormwater runoff in the WQMP and has revised the WQMP accordingly.

W_TC#13: Suggested Change ID #260

Description: Reserve Capacity - describe how reserve capacity would be available with sector specific percent reduction allocations

Comment: Section 12 on page #72 ("Reserve Capacity"): Reserve capacity is an allocation for potential increases in mercury loads from new or expanded sources. This section says reserve capacity may be granted to NPDES permitted point sources and/or nonpoint source designated management agencies and responsible parties. It is not stated how the reserve capacity would be made available for new or expanded sources in a TMDL that includes sector-specific percent reduction allocations. Clarify how the reserve capacity would be made available for new or expanded sources in a TMDL, including sector-specific percent reduction allocations. Please also confirm that the groundwater comment provided above will not be determined as utilizing the entirety of the reserve capacity.

Response: In response to other comments, DEQ removed nonpoint sources for consideration for reserve capacity. This is because all potential nonpoint sources of mercury were captured through the land use evaluation process and, though ownership or land activities may change, no new nonpoint source areas are anticipated to be identified. As explained in Section 12 of the TMDL, DEQ will require demonstration of effluent condition and implementation of DEQ approved mercury minimization measures prior to a determination on allocating a portion of the 1% reserve capacity. This evaluation will occur prior to or during the permit application process for any new point sources or during the permit modification or renewal process for any expansions of existing permitted facilities. DEQ clarifies that reserve capacity is an additional 1% of the relative allocation of load capacity by sector (as shown in Table 10-1), from which portions can be allocated in addition to the sector specific percent reduction allocations.

W_TC#14: Suggested Change ID #261

Description: WQMP - Air Emissions Mercury Reductions

Comment: Section 13.3.3.1 on page #118 ("Other DEQ Mercury Reduction Programs…"):

The section in the draft WQMP titled "Air Emissions Mercury Reductions" is very short – only one sentence – although four paragraphs about air emissions are provided in section 9.1 of the TMDL, and a list of stationary sources of mercury discharged into the air is found in Appendix G. Since "…atmospheric deposition is the major source of mercury" to the river (see page #116), more information should be provided in the WQMP to describe the work DEQ is and will be doing to reduce the amount of mercury which is discharged into the air from sources within Oregon.

Response: DEQ did not make this requested change. As noted in Section 10.2 of the TMDL, the TMDL Technical Support Document found that deposition of mercury onto the Oregon landscape is the dominant source of mercury reaching Willamette Basin streams and that while these deposited air emissions originate as a mix of global, national, regional and local sources, the largest portion is derived from historical deposition of global anthropogenic mercury emissions (TetraTech, 2019). While the percentage of air deposition from within the Willamette Basin cannot currently be quantified, potential air emission

sources have been identified. DEQ reviewed mercury air emissions sources and quantifications from other states' TMDLs, particularly in the densely developed northeastern US, and found the types of facilities (coal burning power generation, medical and other waste incinerators) responsible for significant mercury emissions loads in those areas do not occur in the Willamette Basin. Thus, DEQ's brief description of focus on the three facilities in the basin know to emit more than 1 kg/yr of mercury is appropriate.

W_TC#15: Suggested Change ID #282

Description: Allocations - Table 10-1 - math error - page 61

Comment: There is an error in the math of the fourth equation on page 63. 42.17 g/day — 0.42 g/day = 41.75 g/day not 41.58 g/day.

Response: Correction made in report. Change 41.58 to 41.75

W_TC#16: Suggested Change ID #285

Description: WQMP - Section 13.3.1.11.1 and Section 13.3.1.11.2 - Source Assessment Stormwater Permits and Mercury Loads Section 9.4.2

Comment: Add a statement to clarify that stormwater control measures do not apply to stormwater management areas covered by water pollution control facility (WPCF) permits such as those for underground injection controls (UICs).

Response: DEQ did not add the requested statement to Section 9.4.2 because both Sections 9.4.2 and 9.4.2.1 include qualifications that consideration of mercury loads in stormwater pertain to discharges to waterways. Because WPCF permits and UIC authorizations prohibit discharges to waterways, these cases are already disqualified with the existing language. DEQ added the clarification that measures are required for nonpoint source stormwater discharges "to waterways" in Sections 13.3.1.11.1 and 13.3.1.11.2.

W_TC#17: Suggested Change ID #289

Description: WQMP - Section 13.3.2.2.1 MS4 Phase II Permittees - responsible authority clarification

Comment: Clarify whether developing a control measure effectiveness monitoring strategy applies to entities that choose to implement a mercury minimization plan to meet TMDL requirements as opposed to Phase II jurisdictions covered under an individual permit. If it applies to the former, express it as a bulleted item along with the other required plan elements. Otherwise provide rationale that would make these jurisdictions in greater need of monitoring than a general MS4 Phase II permittee.

Response: DEQ corrected the typo of a missing bullet point to indicate that the requirement of a control measure effectiveness evaluation strategy would be applicable to MS4 Phase II entities upon renewal of an individual permit.

W_TC#18: Suggested Change ID #292

Description: WQMP - Section 13.6 Monitoring and Evaluation - General

Comment: Given their significant experience with monitoring and the potential for significant resource implications, ACWA requests the opportunity to be involved in development of the Assessment and Monitoring Strategy DEQ and EPA are currently developing to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin.

Response: DEQ is committed to public, stakeholder, and DMA engagement in the development of the Assessment and Monitoring Strategy and appreciates ACWA's involvement. DEQ is working with EPA in the development of a draft Assessment and Monitoring Strategy that DEQ will make available for comment and refinement with DMAs and other watershed stakeholders, including ACWA.

W_TC#19: Suggested Change ID #294

Description: Appendix A - Target Fish Species

Comment: Northern Pikeminnow is not an appropriate target fish species due to limited human consumption and establishes an unrealistic goal for the TMDL. Convey a more accurate picture of fish consumption considerations in the Willamette River basin by using a more widely consumed fish or an analogue fish. Equate the use of the Northern Pikeminnow in terms of the margin of safety factors that would otherwise be applied to the use of a salmonid or other widely consumed fish.

Response: The justification for using the Northern Pikeminnow is given in Section 11 of the TMDL document.

W_TC#20: Suggested Change ID #295

Description: Appendix A - Biomagnification Factors - Table 3-5 Correction

Comment: Values used for WRB Cumulative BMF are incorrectly listed as medians but are actually 95th percentile values as pulled from Table 3-3. This impacts Figure 3-7 as well. This relates to Table 6.2 and Figure 6.2 in the TMDL document as well. Were the median values or the 95th percentile values used in moving forward with the translator model? This has important implications in understanding the margin of safety.

Response: There was an editing error in Table 3-3 of the TSD: the values in the Median column are actually the 10th percentile values and the values in the 95%le column are actually the median values. The correct median values are shown in Table 3-5 and Figure 3-7 of the review draft. The error in the TSD table was carried forward into Table 6-2 in the TMDL, while Figure 6-2 in the TMDL is correct. The incorrect tables have been updated in the documents.

Note that the correct median BMFs were used to calculate the water column THg target concentrations via the Translator in Table 4-4 of the TSD and Table 6-4 of the TMDL, and subsequent TMDL

calculations are not affected. However, the column for the lower 95% confidence levels in these two tables mistakenly repeat the median values and have also been updated.

Incorrect columns were also pasted into Table 3-4 of the TSD and have been updated.

W_TC#21: Suggested Change ID #297

Description: Appendix A - WWTP Flows - Table 5-9 (page 89)

Comment: Revise the table to use actual annual average flows rather than design flows to more appropriately estimate current loads because there can be a considerable difference between actual flows and design flows. 57.4 MGD was used to estimate mercury loads for Clean Water Services' Rock Creek treatment facility whereas actual flows are 32.4 MGD for 2018.

Revise the flow for the Salem facility and verify the accuracy of the annual average POTW flows presented in Table 5-9. Table shows 690 MG per year while the annual average flow is 15,085 MG per year.

Response: DEQ compiled flow monitoring records submitted and provided the compiled data to EPA's contractor, Tetra Tech, to be used for establishing existing mercury loads. If available, actual effluent records were used to estimate an average annual discharge for a facility. However, no flow records were available for the four Clean Water Services facilities: Durham, Forest Grove, Hillsboro, and Rock Creek. Therefore, flow information submitted to DEQ in 2017 as part of the variance applications for the four Clean Water Services wastewater treatment plants was applied. This is discussed in Section 5.3.5 POTW Sources in the Technical Support Document and presented in the table notes for Table 5-9.

W_TC#22: Suggested Change ID #298

Description: Appendix A - Mercury Concentrations Reflective of POTW Discharges

Comment: Because median mercury concentration of 2.6 ng/L was used by DEQ to characterize mercury levels for minor municipal facilities when data were not available, this concentration should be used for all facilities where data were not available. The Technical Support Document and table 5-9 (page 89) notes that 11.7 ng/L was used in the model for some POTWs resulting in high modeled mercury concentrations.

Justify the substantially higher concentrations noted in the report or the Wilsonville, Portland (Tryon Creek), and Salem facilities

Response: Table 5-9 identifies POTW facilities lacking mercury monitoring data. To estimate an existing load for a facility lacking site-specific mercury monitoring data, a representative concentration was established using data available from facilities of similar type and size in the Willamette River Basin. More specifically, mercury data from facilities with the same NPDES domestic major class (e.g., NPDES-DOM-C) were applied because the plant capacities are designed to treat similar flow rates. The relatively higher concentrations applied for Wilsonville, Portland (Tryon Creek), and Salem facilities are all based on available facility-specific monitoring records – thus, the concentrations applied are based on the best available data provided by DEQ and represent actual effluent conditions observed at these facilities.

W_TC#23: Suggested Change ID #299

Description: Appendix A - Stormwater Modeling

Comment: Include additional information in the Technical Support Document to better explain the approaches and data that were used for stormwater loads modeling. Add a table to show the MS4 jurisdictions included in the model and the impervious area and effective impervious area estimations used for each to ensure that areas such as those draining to UICs are not included. This will assist conducting the wasteload allocation attainment analyses, which are precursors to developing benchmarks as specified in Phase I MS4 NPDES permits.

Response: The approach for evaluating urban stormwater loads is discussed in Section 5.3.7 of the TMDL Technical Support Document. Loads were estimated for Phase I and Phase II MS4s listed in Table 5-14 and Table 5-15 and urban Designated Management Areas (DMAs) listed in Table 5-17. Coverages provided by Phase I and Phase II cities and counties were used directly to determine the boundary of the regulated MS4 area. Areas designated as draining to UICs and combined sewers were excluded from the MS4 regulated areas applied in the TMDL; however, this information was only available for Portland. As discussed in Section 5.3.7 of the Technical Support Document, alternative spatial coverages, such as the 2017 city limits coverage, were used when jurisdictions did not submit a coverage. A new table was added to the Technical Support Document listing the estimated areas for Phase I and Phase II MS4s. Loading rates vary across the landscape (e.g., due to soil type, weather, etc.), thus, regulated areas cannot be used directly to accurately attribute the total urban stormwater load to individual jurisdictions.

W_TC#24: Suggested Change ID #300

Description: WQMP - MS4 PLREs and WLAAs should both develop benchmarks and be conducted in the second permit cycle

Comment: Section 13.3.2.2.1 - MS4 Phase 1 requirements - The last bullet requires submittal of a pollutant load reduction evaluation (PLRE) and Wasteload Allocation Attainment Analysis (WLAA). The previous bullet acknowledges that there are insufficient data to develop benchmarks Since the same data used to create benchmarks would be required to conduct both the PLRE and WLAA, these analyses should be treated the same as the requirement to develop benchmarks. That is, that benchmarks, PLREs, and WLAAs should not be required in the first permit cycle. Instead, the permit should require collection and submittal of mercury data during the first permit cycle. The benchmarks should be established and PLRE and WLAA should be conducted in the second permit cycle.

Response: DEQ clarifies that development of benchmarks is not required for evaluation of non-structural controls. DEQ included the statement “due to data limitations, mercury benchmarks are not applicable in the first permit cycle after the TMDL is finalized” to acknowledge that initial data sets may not be adequate for developing mercury benchmarks for evaluation of structural controls. However, qualitative evaluation, as required for non-structural controls, is expected in reporting of pollutant load reduction evaluations and wasteload attainment analyses during the first permit cycle following issuance of the TMDL.

W_TC#25: Suggested Change ID #331

Description: WQMP - Section 13.4.1 Implementation Plan Timeline Coordination

Comment: As part of the Willamette River Basin TMDL five-year review, implementation plans were recently updated and submitted to DEQ in late 2018 and early 2019. Please consider lining up the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance.

Align the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance. Allow an additional time frame for county implementation of six minimum measures in Table 13-11 due to expansive geographies and overlapping jurisdictions.

Implementation plans (Section 13.1.1)

TMDL Text: DEQ typically gives DMAs and responsible persons 18 months to submit new or updated implementation plans following the issuance of a TMDL and WQMP. For this WQMP, DEQ will continue using the 18-month time frame for implementation plan submittal. For point sources, wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. (p. 73-74) MS4 permit holders must also develop and submit a TMDL implementation plan that demonstrates how nonpoint source load allocations will be met. This plan must include management strategies to reduce runoff and erosion that discharge directly to waterbodies. (p97)

Comment: Clarification is needed around these statements and associated requirements. The City and others just submitted updated TMDL Implementation Plans as required by DEQ following the recent 5-year review. Portland's implementation plan (dated March 1, 2019) already covers mercury and describes strategies that the City is using to address this and other TMDL pollutants. Will the City be required to re-submit this plan in 18 months? Please clarify or amend the requirement to make an exception for DMAs that already have TMDL Implementation Plans that address mercury.

Response: DEQ agrees that keeping the five year reporting cycle consistent between the Willamette Basin TMDLs will be more efficient. The last five year review for the Willamette Basin occurred in 2018. The next five-year review will occur in 2023 and will include implementation activities related to the 2019 Mercury TMDL. In other words, the next five-year review will include information about mercury-related strategies that some DMAs started implementing in the middle of their current five year cycle. The objective of this timeline is to retain a consistent five-year reporting cycle for current and future Willamette Basin TMDLs. Some designated management will continue to have alternate five year cycles based on previous implementation and reporting schedules, for example DMAs in the Molalla-Pudding subbasin.

Following the issuance of the mercury TMDL, updated TMDL implementation plans to meet the WQMP will be due within 18 months (i.e. around May 2021 if TMDL approved by end of November 2019). DEQ basin coordinators will review and approve updated implementation plans to ensure plans meet requirements in the revised mercury WQMP. Depending on the content of the implementation plan, some DMAs may already meet requirements, while others will not. It is likely that DMAs will need to make some updates to align with the WQMP, including development of measurable objectives if absent. The implementation plan may also need language to clarify how a DMA's existing MS4 or other program meets the WQMP.

41. Comments from: Rowe, Blake of Oregon Wheat Growers League

R_B#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

R_B#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon’s farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

R_B#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

R_B#4: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

R_B#5: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

R_B#6: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may

be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

R_B#7: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

R_B#8: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include “an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system.” In addition, modeling to support the TMDL update “must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…” These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ’s mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

R_B#9: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to gaged flows, the modelers reported that "Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows"; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading. DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural

land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

R_B#10: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is "estimated to be 361 g/day", a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value "351.42 g/day" for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

R_B#11: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the

low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

R_B#12: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

R_B#13: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

R_B#14: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each separately. -Providing examples in which "sites", which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

R_B#15: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including "sites" as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A "random effect" is a statistical term for describing a site specific effect on the value of a variable. The term "fixed" effect refers to how the value of a variable changes according changes in the value of another variable. In the case of the TSS surrogate analysis, the "random effect" is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

R_B#16: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the

water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

R_B#17: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate "to estimate allocations for pollutants addressed in the TMDL". However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be "used for evaluating effectiveness of the TMDL" because monitoring of "total mercury can be difficult and cost-prohibitive". This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

R_B#18: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

R_B#19: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are

protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

R_B#20: Suggested Change ID #303

Description: WQMP - Implementation Plans - global sources

Comment: In Timeline for Attainment section, ODF appreciates the recognition of global mercury emissions and air deposition as the primary mercury source in Oregon. Messaging to other entities (local, regional, national, global) about this issue is important.

Response: DEQ agrees with the comment.

R_B#21: Suggested Change ID #312

Description: Modeling - LA modeling is based on uncertainty

Comment: Load allocation modeling is based on uncertainty. Mercury wasteload allocations are based on six separate and contested computer models, each with accompanying uncertainties. Additionally, the 'mass balance model' has compounded uncertainties because it utilizes two models' outputs as the inputs. This layering of uncertain modeling injects significant uncertainty into the load allocations.

Response: Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

R_B#22: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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42. Comments from: Secord, Richard and Laura

S_RL#1: Suggested Change ID #8

Description: WLA - 700PM - suction dredging removes (98% of) mercury from streams

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because a 2002 EPA study and a 2005 State Water Resources Control Board Division of Water Quality staff report found that suction dredging extracts up to 98% of mercury from streams

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. DEQ clarifies that the 2005 CA Waterboards study (referenced in the TMDL as Humphreys 2005) found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

S_RL#2: Suggested Change ID #27

Description: WLA - 700PM - TMDL proposes leaving mercury in streams rather than allowing impacts during suction mining which removes mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ staff are idiots or have an anti-mining agenda to propose leaving 100% of mercury and lead in streams rather than risk reintroduction of 2% during removal of 98% with free suction dredging.

Response: DEQ clarifies that the study referenced in the TMDL as Humphreys 2005 found that suction dredging in a mercury hotspot recovered approximately 98% of the mercury from an enriched test sample and at the same time found that the 2% mercury lost from the dredge was more than ten times higher than hazardous waste classification levels. Further, the same study found that the mercury lost during dredging was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. As noted in DEQ's response to comments on the 2014 renewal of the 700-PM permit, California's interpretation of its own data found "Removal of such mercury by suction dredges will likely be site-specific and, regardless of how much is removed, the amount of mercury discharged remains the most relevant factor when conducting the water-quality impact assessment." "Finally, the total mass of elemental mercury removed from the stream by dredge operators is likely insignificant relative to the total amount of mercury remaining in watersheds affected by gold mining."

S_RL#3: Suggested Change ID #41

Description: General - comment period too short

Comment: NA

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe required in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

S_RL#4: Suggested Change ID #44

Description: General - DEQ did not include miners in the decision making process

Comment: NA

Response: DEQ does not agree that miners did not have opportunity to participate in the TMDL process. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL. A 25-member Advisory Committee was established with representation by stakeholders from both point sources and nonpoint sources that met 2 years and for which all meetings were publicized and open to the public. As DEQ determined allocations in January through July of 2019, DEQ also held

meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. All affected parties were also invited to review materials, contact DEQ staff with questions and provide comments at a public hearing, held at two locations spanning the Willamette Basin, and throughout a 66 day public comment period.

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43. Comments from: Eliason, Michael of Association of Oregon Counties

E_#1: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures - rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the

options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

E_#2: Suggested Change ID #135

Description: WQMP - Stormwater - PS and NPS - Program cost to local governments, citizens

Comment: The proposed TMDL rules will be extremely burdensome for small communities and county governments who lack the resources to design and create the type of programs needed
to identify and reduce 88% of non-point source mercury pollution. Our residents expect clarity, predictability and reasonableness. We cannot justify to permit applicants that the increased burden is due to a potential 1/15th of 1% of potential mercury loading. Applicants could be subject to hiring engineers, paying for design plans, increased structural facilities, and increased County fees and other technical costs – again, in the rural area where vegetation and infiltration generally occurs.
The new requirements are trying to reduce large scale pollution that is beyond the control of local governments to handle alone.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

E_#3: Suggested Change ID #188

Description: WQMP - Stormwater - MS4 boundary needs to be defined in order to determine where non-urban DMA requirements apply

Comment: Jurisdictions with an MS4 permit become responsible for the non-point source pollutants outside of the permit boundary. For these areas, the local municipality will need to implement the Six Minimum Control Measures required for non-permitted urban DMA. However, there is no clear definition for "MS4 permit boundary" to identify the areas that fall into this category. The vague requirement creates additional uncertainty and makes it more difficult for local municipalities to comply. The vague boundaries also question the previous condition that a DMA could partner with adjacent municipalities to implement the Six Minimum Control Measures. Whether or not this partnership is still allowed is unclear.

Response: The term "MS4 permit boundary" describes where MS4 permitting requirements apply within a permit holder's jurisdiction. Each MS4 permit holder has information indicating where that boundary is. Generally, DEQ uses the Urban Growth Boundary (UGB) for Phase I permit holders. For Phase II permit holders, the boundary is based on the U.S. Census designated urbanized area (UA), which is defined based on a number of characteristics. MS4 permit holders must apply permitting requirements based on their permit specifications.

The six stormwater control measures would apply to areas which are outside the MS4 permit boundary, but still within the city or county jurisdiction. In cases where cities and counties can show that the MS4 permit covers their entire jurisdiction, where appropriate, then the six stormwater control measures are already being applied based on implementing the MS4 permit. Cities and counties must include this important information in their TMDL implementation plan update and clearly articulate how the six stormwater requirements are being met. The overall goal is to ensure that urban areas in MS4 jurisdictions are implementing, at a minimum, the six stormwater control measures identified in Table 13-10 throughout its jurisdiction. DEQ added language to the WQMP to clarify these goals.

DEQ also made changes to the WQMP to affirm that cities or counties may continue to partner with other jurisdictions, as appropriate, to meet these requirements. If jurisdictions pursue these partnerships, DEQ encourages cities and counties to have formal agreements in place to ensure requirements are met.

E_#4: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas

with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

E_#5: Suggested Change ID #226

Description: WQMP - Stormwater - Entities required to implement reduction programs where mercury is not detected

Comment: The WQMP acknowledges the lack of data available to determine the amount of mercury displaced by smaller communities but still imposes new, more strict regulations with difficult reduction benchmarks. For example, tests conducted on road construction projects in Linn County could not detect any amount of mercury in the soil, and yet they would still be required to perform the additional reduction programs under the new rule. Even with this uncertainty, small municipalities (including two additional counties) will be required to reduce mercury loads from nonpoint sources by 75%.

Response: DEQ acknowledges that there is uncertainty inherent to modeling estimated mercury loads, particularly from source categories with limited data available. However, as noted in Section 13.3.1.11, adequate information on mercury in stormwater from urbanized areas is available for DEQ to conclude that environmentally significant concentrations of mercury are found in stormwater from developed areas and, therefore, reductions are needed. DEQ further clarifies that the 75% reduction noted in the comment applies only to stormwater discharges into waters within the Willamette Basin from developed areas not already covered by an MS4 permit.

E_#6: Suggested Change ID #236

Description: WQMP - Stormwater - Need clear means of demonstrating compliance with mercury reduction goals

Comment: An 88% reduction goal for non-point sources of mercury without data or a clear means of measurement sets local governments up for noncompliance.

The identified projects for rural communities are broad, expensive, and not easily measured. Regulated entities cannot create and implement a program without a clear means of demonstrating compliance and remain good stewards of public money.

Collection and measurement practices used to identify mercury pollutants are difficult and uncertain, requiring extensive resources. Both MS4 Phase I and Phase II permit holders will be expected to show their progress toward attaining a 75% reduction benchmark without a firm standard of measurement, increasing the risk of noncompliance.

The Draft document needs to specifically state how a county would demonstrate compliance, including addressing Oregon weather events and slope stability issues that are out of a counties control.

Mercury loading is based on a wide variety of diffuse sources, conditions, variable soils, and weather. According to the Oregon Association of Clean Water Agencies (ACWA), the Draft Mercury TMDL includes invalid bases for methodology. For these reasons, several counties are concerned as to how specifically we would demonstrate compliance.

The Draft TMDL requires a 75 percent reduction of mercury loads across the sector of all “non-permitted urban DMAs”, which is a 1 percent estimated total load. This insignificant impact would be impossible to demonstrate specific to the County. We cannot get into a situation where compliance cannot be demonstrated.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

Counties will work with DEQ basin coordinators to update or revise TMDL implementation plans to include required management programs in the WQMP. DMAs will demonstrate compliance with the mercury TMDL by implementing the DEQ-approved TMDL implementation plan. Compliance with TMDL requirements for MS4 permittees will be demonstrated through compliance with their permit. DEQ acknowledges that events, such as rain, flooding, and fire are natural events beyond human control. DEQ is developing a monitoring strategy to assess implementation actions in meeting mercury water quality standards over time.

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44. Comments from: Kirsch, Paul of G.A. Miller Drainage District

K_P#1: Suggested Change ID #111

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #1

Comment: We are concerned the lack of clarity and potential negative impacts related to the role of irrigation districts and similar entities in implementing water quality standards will lead to increased conflict and costly litigation rather than collaborative partnerships necessary to achieve measurable water quality improvements.

Response: DEQ must address the elements of a TMDL described in OAR 340-042-0040 (4) (a-l) in order to meet the rule as well as to attain approval from EPA. One of the elements required in a TMDL is, "Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans," (OAR 340-042-0040 (4) (G). DEQ has authority to identify persons responsible for implementing the TMDL, which includes but is not limited to DMAs. DEQ uses the term "responsible persons," to identify "persons…responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans."

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill

permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

K_P#2: Suggested Change ID #117

Description: Editorial - "Responsible person" term not well defined

Comment: The proposed Willamette Basin Mercury TMDL and associated WQMP utilizes the term "Responsible Persons" (RPs), which appears to be a new term that is undefined under either Oregon statute or rule, with uncertain meaning and tremendous potential for legal liability. While DEQ has stated RPs are not Designated Management Agencies (DMAs), the draft TMDL lists water conveyance entities as a "DMA category" (see Appendix E), thereby creating additional uncertainty over what this term means and what implications it has for districts. We agree irrigation districts are not DMAs, which are defined in OAR 340-042-0030(2) as entities "that [have] legal authority of a sector or source contributing pollutants." However, it is unclear what the legal distinction and potential liabilities are in implementing TMDLs as an RP versus a DMA.

Response: DEQ agrees that the column header in the table shown in Appendix E is inaccurate and the column header was revised to reflect responsible persons as well as Designated Management Agencies.

In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

K_P#3: Suggested Change ID #174

Description: WQ Impairments - No evidence that district activities contribute to mercury in basin

Comment: There is no evidence that district activities directly contribute to mercury loads and therefore are unlikely to have any impact on the amount of mercury in the Willamette Basin.

Response: DEQ acknowledges that the TMDL does not include data specific to water conveyance entities. In other words, there are no system- specific data available to support inclusion or exclusion of water conveyance entities from the TMDL. An important element of this TMDL is to at a minimum identify where these systems exist on the landscape and what maintenance and operations activities are implemented within these systems. This represents progress toward a better understanding of the potential impact of water conveyance systems on water quality. DEQ identified these entities as responsible persons because of their process, practice, activity or resulting condition may contribute mercury.

K_P#4: Suggested Change ID #176

Description: WQMP - Funding of RPs

Comment: In addition to the lack of clarity and authority, irrigation districts and similar entities do not have resources to implement the proposed TMDL and related WQMP. Many of the proposed RPs are small districts with little or no paid staff. These small entities lack the financial resources and management structure to implement the proposed WQMP, increasing the likelihood of non-compliance. Even entities with staff struggle with understanding what role their particular district has in addressing mercury TMDL allocations. Our organizations remain committed to conducting outreach and education to our respective members, but we are extremely concerned about the potential unfunded regulatory burden being placed on these entities.

Response: DEQ acknowledges the fiscal impact to all entities responsible for implementing the TMDL. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to coordinate and collaborate on implementation in order to improve implementation efficiency as well as reduce/ share costs when feasible.

K_P#5: Suggested Change ID #177

Description: WQ Impairments - Source of mercury

Comment: In the proposed TMDL, DEQ acknowledges the lack of information about water conveyance entities' impacts regarding mercury and would appear to be requesting more information about operations so that it can further regulate entities that may not have any control over the amount of mercury entering or returning to waterways in the Willamette Basin. While DEQ staff have asked districts to provide detailed descriptions of their water conveyance systems under the auspices that it would lead to being excluded as an RP, such information is unlikely to be provided due to potential liabilities and safety concerns associated with such descriptions being accessible online. Coupled with the lack of clarity over what the role of an RP is in the first instance, we are concerned that information provided in good faith will be used create more onerous and unattainable allocation reduction burdens for individual districts, in addition to only fueling more litigation.

Response: An important element of this TMDL is to at a minimum identify where these systems exist on the landscape and what maintenance and operations activities are implemented within these systems. This represents progress toward a better understanding of the potential impact of water conveyance systems on

water quality. It is important to obtain system- specific information in order to implement the TMDL as well as address other concerns stated by OWRC, i.e. a lack of system- specific data in the TMDL.

K_P#6: Suggested Change ID #179

Description: WQMP - Responsible persons - Clarify responsibility of RPs

Comment: In summation, OWRC and OFB appreciate DEQ's ongoing efforts to protect Oregon's water quality, but we have significant concerns about the proposed implementation approach. Placing additional unclear and unfunded mandates upon irrigation districts and similar entities will only lead to additional conflict and litigation rather than improved conditions. We continue to be supportive of irrigation districts and similar entities actively participating in collaborative, basin-wide efforts through local SWCDs and working with appropriate DMAs like ODA. While a long-term solution is needed, at the very least, we urge you to clarify that irrigation districts and similar entities are not responsible for developing or implementing water quality management plans related to activities not within their scope of operations, control, or legal management authority. Your time and consideration of our comments is greatly appreciated.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics

of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

K_P#7: Suggested Change ID #189

Description: WQMP - Responsible persons - No Authority to Designate Water Conveyance Systems as RPs - Comment 73

Comment: The Proposed TMDL seeks to regulate Designated Management Agencies ("DMAs") and "Responsible Persons." DMAs are defined by DEQ's regulation as "a federal, state or local governmental agency that has legal authority of a sector or source contributing pollutants and is identified as such by the Department of Environmental Quality in a TMDL." OAR 340-042- 0030(2). A regulatory definition for "Responsible Persons" does not exist. At most, "Responsible Persons" are only referenced in relation to DMAs in the establishment of water quality management plans: (G) Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. "(I) Schedule for preparation and submission of sector-specific or source-specific implementation plans by responsible persons, including DMAs, and processes that trigger revisions to these implementation plans." OAR 340-042-0040. (Emphasis added). Yet, in the Proposed TMDL, DEQ deems" [a] responsible person is an entity identified in a TMDL that has responsibility to meet assigned allocations and/or surrogate measures." (Proposed TMDL at 77-169) The regulations tie Responsible Persons to "management strategies," which again, focuses on controlling pollution being added to regulated waterbodies. OAR 340-042-0030(6) (defining "management strategies" as "measures to control the addition of pollutants to waters of the state and includes application of pollutant control practices, technologies, processes, siting criteria, operating methods, best management practices or other alternatives.") (Emphasis added). This definition calls into question DEQ's proposal to hold Water Conveyance Systems accountable for pollutants already in regulated waterbodies.

Response: The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

K_P#8: Suggested Change ID #373

Description: WQMP - Responsible persons - "water conveyance entities" is a new term that hasn't been defined by statute.

Comment: Commenter is concerned that "water conveyance entities" is a new term that hasn't been defined by statute.

Response: Water conveyance entities were identified as responsible persons in the Water Quality Management Plan of the TMDL. DEQ used the term as it is understood according to its commonly

understood meaning. However, in response to the comment and to avoid any confusion, DEQ has identified individual entities by name when identifying them as responsible persons in the WQMP.

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45. Comments from: Niewendorp, Clark

Nw_C#1: Suggested Change ID #34

Description: General - Are TMDL authors OR licensed engineering geologists or civil engineers?

Comment: NA

Response: DEQ's Willamette Basin Mercury TMDL was written by a team of DEQ staff, in coordination with EPA and EPA's contractor Tetra Tech. None of the DEQ team are registered professional geologists or environmental/civil engineers. The TMDL Technical Support Document was authored by Tetra Tech. The Tetra Tech team was led by a nationally recognized expert and registered Professional Hydrologist with 32+ years of experience in watershed planning, risk assessment, water quality management, and development and application of hydrologic and water quality models.

Nw_C#2: Suggested Change ID #49

Description: General - DEQ did not include miners in the TMDL Advisory Committee

Comment: NA

Response: The Willamette Basin drains approximately 12% of the state of Oregon or 11,460 square miles, includes 12,760 miles of streams and supports 70% of Oregon's population. DEQ strived to engage all affected stakeholders in discussions regarding development of the revised TMDL, including establishing an Advisory Committee with 25 non-DEQ members that committed to participate for 2 years to provide input on source identification, allocations and prioritization for implementation. Advisory Committee members were selected in consideration of the 2006 TMDL, which identified nonpoint source land uses as the largest mercury source reductions needed. Included in the Advisory Committee was a representative from the Oregon Department of Geology and Mineral Industries. As DEQ determined allocations in January through July of 2019, DEQ also held meetings with specific groups of designated management agencies, responsible persons and other affected parties. These groups included agriculture uses, forestry uses, municipalities, water conveyance entities and 700PM-permitted miners. While DEQ believes the right proportional participation balance was struck on the large Advisory Committee, DEQ will consider inviting a representative of the suction dredge mining community to participate in future Willamette Basin Advisory Committee opportunities where relevant.

Nw_C#3: Suggested Change ID #94

Description: WLA - 700PM - remediation of Champion Mine also cleaned up mercury in Brice Creek so additional sampling is needed

Comment: Do not prohibit suction dredge mining in Brice Creek because Champion Mine remediation also cleaned up mercury in Brice Creek and additional sampling is needed to show current mercury contamination levels

Response: In response to this comment, DEQ reviewed available reports on the Champion Mine remediation activities and post-removal action sampling, including sediment sampling in Champion Creek between 2004 and 2012 (report available at: https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=bb0d35d9-a2bd-4906-bc01-ad7b9dc1b9c6pdf&s=Champion Mine 2012 FINAL Monitoring Report 1-10-13.pdf). DEQ did not find that removal actions were conducted within Champion Creek, rather tailings piles were removed from the uplands and a wetland treatment system was installed to prevent metals contaminated discharges from leaving the uplands. Post-removal action sampling at five locations within Champion Creek between 2004 and 2012 detected mercury at concentrations ranging from 0.08 mg/kg to 8.78 mg/kg. Sediment samples in 2012 detected mercury in Champion Creek sediments ranging from 0.16 mg/kg to 5.7 mg/kg. DEQ included this reference and updated information in the TMDL as further confirmation of the presence of mercury contamination in Champion Creek. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

Nw_C#4: Suggested Change ID #104

Description: Reasonable Assurance - Monitoring strategy is needed to determine if management approaches work

Comment: Is there going to be a monitoring program that gauges the success or failure of those management goals with well-defined performance milestones, monitoring strategies, and evaluation criteria? The monitoring program should not be based on the TSS surrogate.

Response: Section 14.1.6 of the TMDL includes a high level description of the planned Assessment and Monitoring Strategy. DEQ and EPA are continuing to coordinate on ensuring the monitoring strategy is comprehensive and will measure success of management measures.

Nw_C#5: Suggested Change ID #105

Description: General - The TMDL and TSD should be peer reviewed

Comment: It is our understanding the DEQ Mercury TMDL modeling provided by TetraTech was not peer reviewed and has not been validated.

Please explain how the TMDL and TSD were peer reviewed.

Response: DEQ's Willamette Basin Mercury TMDL was written by a team of DEQ staff, in coordination with EPA and EPA's contractor Tetra Tech. Prior to finalization of the draft TMDL, additional staff, managers, leadership and attorneys from both DEQ and EPA reviewed the document. The TMDL was then published for public review and comments submitted were carefully considered and changes were integrated, as warranted. The TMDL Technical Support Document was authored by Tetra Tech. The Tetra Tech team was led by a nationally recognized expert and registered Professional Hydrologist with 32+ years of experience in watershed planning, risk assessment, water quality management, and development and application of hydrologic and water quality models.

Nw_C#6: Suggested Change ID #106

Description: Modeling - limitations are glossed over

Comment: NA

Response: DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. These uncertainties are noted throughout the TMDL Technical Support Document and are an inevitable result of incomplete data, as cited in the comment, and approximations required to simulate a large and complex system. While information is incomplete, the Clean Water Act does not require complete information to move forward with a TMDL. Federal Regulations define the TMDL as the sum of wasteload allocations for point sources and load allocations for nonpoint sources, and in turn define load allocations as "best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading" (40 CFS 130.2(g)). In addition, requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" The requirements of both the court and the Clean Water Act were met because the structure of the revised TMDL follows that of the 2006 TMDL and the modeling and technical assessments for the revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

Nw_C#7: Suggested Change ID #107

Description: Source Assessment - Legacy Metals Mining and naturally occurring geology are both contributing sources of mercury to Cottage Grove and Dorena Reservoirs

Comment: Actual text: "about the Cottage Grove and Dorena Lake reservoirs … The THg-MeHg data collected from the reservoir, as well as the data for the URRW above it, cannot be attributed entirely to past legacy metal mining. Today you have to consider other possibilities for the THg problem in Dorena

Lake. For instance, sediment yields influenced by commercial logging involving clear-cuts, selective cutting, and splash dams."

Response: DEQ agrees that total mercury loads to Cottage Grove and Dorena Lake consist of a mixture of mining and other sources. As shown in Table 5-21 of the TMDL Technical Support Document, the largest sources of total mercury load in the Coast Fork HUC8 (17090002) are forest and shrubland, which together contribute more than four times the load attributed to mining sources. DEQ also agrees that there is more to be learned about the exact contributions from legacy mining sources and thank the commenter for the information and interpretation. DEQ agrees that mining sources are significant and therefore the TMDL includes actions to address mining sources.

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46. Comments from: Baumgartner, Robert P. of Clean Water Services

B_RP#1: Suggested Change ID #66

Description: Reserve Capacity - require further reductions for reserve capacity

Comment: Table 10-1, page 62. "Reserve Capacity is not allocated as a percent reduction, rather an additional 1 percent reduction is required from atmospheric deposition, which will be used for any needed reserve capacity."

Allocating a reserve capacity for future sources is valuable but creating a reserve by expecting further reductions in atmospheric deposition may not be supportable. It is stated in the TMDL that atmospheric deposition is largely out of the States control, because a large majority of the loading originates in the global atmospheric pool. Since the watershed currently exceeds the mercury target set in the TMDL, it may be more justifiable to call for further reductions from sources within the Basin which are controllable.

Response: 'DEQ agrees and has made this change on page 65, Section 10.2: in the last paragraph change "10 percent" to "11 percent" for reduction in local atmospheric sources: The 11 percent reduction for atmospheric sources is anticipated to occur through controls on local emissions within Oregon, but to greater extent through on-going reductions being achieved nationally (United Nations Environment Programme, 2019) and in the future through enactment and implementation of international treaties.'

B_RP#2: Suggested Change ID #120

Description: Allocations - Table 10-1 - source sector clarifications needed

Comment: Allocation Table (Section 10, Table 10-1, p62)

Please clarify information in Table 10-1, particularly regarding source sectors and associated allocations. Some sectors are repeated with conflicting allocations, making it difficult to understand how each sector is defined and what the requirements are. For example, Non-Permitted Urban Stormwater is included both as its own sector and with the "general nonpoint source" sector with allocations of 75% and 88% reductions, respectively.

This should be revised to reflect the 75% reduction being sought from this sector. Similarly, atmospheric deposition is specified as both an 88% reduction and an 11% reduction.

Page 62. Table10-1 is confusing because it indicates general nonpoint source and background captures non-permitted urban stormwater and atmospheric deposition, then lists these two sources separately. While they are unified for existing loads, they are listed separately for allocations. This could be displayed more clearly by displaying the source sectors as below or you could add notes to the 75% and 11% required reductions. (EPA comment #15)

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. For clarity, particularly with regard to implementation, DEQ used different terminology for labeling source categories in the TMDL and WQMP than was used for labeling source categories in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. No sector is assigned more than one allocation, as summarized in the revised Table 10-1.

B_RP#3: Suggested Change ID #125

Description: WQMP - MS4 effectiveness evaluation

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117) In the second sub-bullet, please remove the term "monitoring" and replace with "evaluation" to allow both qualitative and quantitative methods for evaluating control measure effectiveness.

The second sub-bullet, beginning, "An effectiveness monitoring strategy…" should instead require a strategy for evaluating the effectiveness of control measures. The use of the term "monitoring" could be interpreted to require only water quality monitoring, which is not necessary the most effective way to evaluate the effectiveness of control measures, which are predominantly Best Management Practices. Requiring evaluation of effectiveness allows more flexibility across the range of control measures.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language.

B_RP#4: Suggested Change ID #129

Description: WQMP - Stormwater - requirements for current MS4 permit holders

Comment: Nonpoint source stormwater management requirements for MS4 Permit holders (Section 13.3.1.11.1) TMDL Text: As DMAs for nonpoint sources of mercury, MS4 permit holders must also implement the six stormwater control measures, as described in Table 13-10, in their jurisdictional areas outside of the urbanized area covered by their permit. (p96)

Comment: The application of the MS4 six minimum measures in non-MS4 areas is problematic, particularly in Portland which has a combined sewer area that is already covered as a separate source in the TMDL and has a large area served by Underground Injection Controls (UICs), which is regulated by the Safe Drinking Water Act and covered by the City's Water Pollution Control Facility (WPCF) UIC permit. Please clarify that DEQ's intention for these non-MS4 areas is to rely on existing regulatory mechanisms and not the six minimum MS4 measures. Please clarify further that the education and outreach effectiveness evaluation listed in Table 13-10 does not apply to existing MS4 Phase I permit registrants, as it is not a requirement in Section 13.3.2.2.1 of the WQMP and Phase I communities are already conducting education activities as required by the MS4 permit. Furthermore, the City is concerned that DEQ's broad-brush approach with the six minimum measures takes limited DMA and DEQ resources away from more important priorities. The rationale for such an approach was not adequately addressed in the TMDL, as it was not demonstrated how each of the six measures will actually contribute to reductions of mercury. The Illicit Discharge Detection and Elimination (IDDE) requirement, for example, will require tremendous resources for parties to implement with little to no effect on mercury sources, while the focus should be on erosion control.

Response: DEQ agrees with several of the comments and revised Section 13.3.1.11 in the WQMP to address needed clarifications. DEQ clarified that existing regulations related to water quality protection, such as permits associated with the Underground Injection Program to protect discharges to groundwater, will not be replaced by stormwater control measures because discharges from these areas do not go to surface water. DMAs should contact DEQ if they have questions about the applicability of required stormwater control measures in areas where other related regulations exist.

The six stormwater control measures have long been recognized by EPA and others as an effective approach in reducing pollutants from urban runoff. The control measures were not intended to address any one pollutant, but rather many pollutants found in urban stormwater, including sediment and mercury. In keeping with EPA Guidance cited in the TMDL/WQMP, implementation of wasteload allocations in stormwater permits are typically expressed in the form of best management practices. DEQ's analysis indicated that mercury is present in all land uses, including urban areas, and can be transported to waterbodies either through runoff or attached to sediment. Furthermore, many cities are already familiar with these stormwater control measures and will be able to use their extensive experience in evaluating effective urban BMPs and practices to control erosion and runoff. Note that DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

In addition, DEQ anticipates that extending the six stormwater control measures outside a city's MS4 permit area, but still within a city's jurisdiction will not be insurmountable. This "implementation gap" is likely small for most cities, some of which are already applying some of the stormwater control measures to these areas. While the six minimum stormwater measures in Table 13.10 are less prescriptive than MS4 permit requirements, MS4 permit holders may choose to implement requirements under their permit within and outside the urbanized area of their permit for implementation consistency. This approach would either meet or exceed the requirements in Table 13.10.

Finally, it is not DEQ's intention to duplicate any existing efforts of DMAs, including its public outreach and education program. To avoid any confusion, DEQ revised language in the public and education program component in Table 13.10 to clarify that DMAs must perform a qualitative assessment of at least

one education and outreach component as part of TMDL annual reporting. This qualitative assessment is not the same as the requirement in the Phase I MS4 permit to conduct a comprehensive effectiveness evaluation. DEQ anticipates that MS4 permit holders would continue applying their public outreach and education programs to these "implementation gap" areas outside their permit coverage using approaches already gleaned from the effectiveness evaluation.

B_RP#5: Suggested Change ID #198

Description: TMDL Target - Northern Pikeminnow as standard

Comment: In addition, the LOC again reiterates is support of the ACWA Comments dated August 29, 2019, and specifically would like to echo concerns over the underlying assumptions based on consumption of Northern Pikeminnow. We would like to have additional information regarding the use of this fish species as the water quality standard is based on fish consumption of 175 grams per day (equal to 30, 6-oz servings a month).

Response: The data and analysis used in the development of the TMDL will be available through our website. The selection of the Northern Pikeminnow to calculate the load capacity was not based on the assumption that this fish species is consumed at the rate of 175 grams per day, so DEQ does not have any additional information regarding this. Please see the Margin of Safety section of the TMDL for the rationale for the selection of Northern Pikeminnow.

B_RP#6: Suggested Change ID #237

Description: Allocations - General text revision

Comment: Section 10, Allocations: On page 61 of the TMDL, the next-to-last sentence of the first paragraph states, "The waste load allocations are used to establish effluent limits in discharge permits." Since the TMDL is not suggesting inclusion of numeric effluent limits in permits but rather narrative management practices to implement the wasteload allocations, this sentence should be revised to state that "the implementation strategy associated with the wasteload allocations is incorporated into discharge permits."

Response: DEQ did not make changes to the statement: "The waste load allocations are used to establish effluent limits in discharge permits." While it is true that DEQ is not establishing numeric effluent limits in wastewater permits, once the TMDL is acted on by EPA, DEQ will implement narrative water quality-based effluent limits in permits that are consistent with the assumptions and requirements of the wasteload allocation for the discharge prepared by the State and approved by EPA. This is consistent with the Code of Federal Regulations, EPA guidance and precedent on multiple other states.

B_RP#7: Suggested Change ID #238

Description: Allocations - Table 10-1 PS clarification

Comment: Table 10-1 allocates a 10 percent reduction to NPDES Wastewater Point Source Discharges, but the TMDL applies this reduction only to major municipal NPDES discharges and excludes minor municipal facilities as de minimis and not subject to the 10 percent reduction. Table 10-1 should be explicit that only major municipal NPDES discharges are subject to the 10 percent reduction allocation. It would be helpful to be explicit on permit expectations (even if none) for de minimis sources to limit future confusion related to permit conditions. Also, any clarification of how the reduction would apply if a minor source becomes a major source due to growth or pretreatment would be helpful. Provide a note in Table 10-1 that clarifies the 10% NPDES wastewater point source discharges reduction applies to major municipal NPDES wastewater discharges only because minor municipal facilities are considered de minimis in other sections and not subject to the 10% reduction.

Response: DEQ did not make the requested changes to Table 10-1. The table correctly identifies the sector-specific allocation of a 10% reduction that is aggregated across all permitted wastewater discharges. Section 10.2 further specifies the permits covered under this sector and explains DEQ's rationale for aggregating the allocations, as allowed under the Clean Water Act (per 40 CFR 130.2(i)) and supported in multiple guidance documents and by precedent in multiple approved TMDLs from other states. Section 10.2 goes on to give a brief overview of the wasteload allocation implementation approach and notes that implementation details are specified in the Water Quality Management Plan, which is found in Section 13 of the TMDL. Section 13.3.2.1.1 provides the explicit information regarding permit requirements by permit type, as requested in the comment. DEQ determined that the WQMP is the appropriate location for such implementation details. Finally, as noted in Sections 13.6 and 14 of the TMDL, DEQ will monitor and evaluate progress toward the goal of attaining mercury water quality standards and intends to adaptively manage progress in attaining those goals, which can over time entail application of additional requirements within sectors, as warranted by evaluation results.

B_RP#8: Suggested Change ID #239

Description: Editorial - WQMP - WLAs will not be incorporated into permits but implemented by incorporating the management strategies identified in Section 13.3.2

Comment: Section 13.1.1, Implementation Plans: This section states that wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. Since the draft TMDL includes specific permit conditions that will be included in NPDES permits to implement the sector-specific wasteload allocations, this section should clearly state that the wasteload allocations will be implemented by incorporating the management strategies identified in Section 13.3.2. and not by including the sector-specific wasteload allocations from Table 10-1 into NPDES permits. Clearly state that the wasteload allocations will be implemented by incorporating the management strategies identified in Section 13.3.2

Response: DEQ agrees with the comment and revised the text of Section 13.1.1.

B_RP#9: Suggested Change ID #240

Description: WQMP - Six minimum measures not appropriate for rural areas

Comment: Section 13.3.1.11, Local Government: Cities and Counties. The District has an established working relationship with the City of Gaston (which is within the District's jurisdiction, but outside the

MS4) and with Washington County (a co-implementer than also will be responsible for rural areas outside the MS4) that ensures successful cooperation to address water quality in the Tualatin basin. The comments below reflect the District's concern that the WQMP's highly prescriptive requirements will impact that relationship and divert local resources away from programs that have shown demonstrated success. The WQMP's requirement to implement the six minimum measures from the Phase II rule is not appropriate for sparsely populated regions outside of MS4 permitted areas, such as those in rural Washington County. Although much of Washington County and other counties in the basin are densely urban, the area outside the MS4 areas and outside the Urban Growth Boundaries and are distinctly rural, typified by dispersed population in agricultural and predominantly less developed areas. The six minimum measures were developed for urban areas; applying them outside MS4 permitted areas could appear to be an attempt to impose MS4 permit requirements on locations that are neither Phase I nor Phase II communities. A more tailored approach that provides the opportunity for the counties to develop control strategies better designed for the rural areas would be more effective than narrowly construed application of the six minimum control measures. Of particular concern is the specificity of the descriptions in Table 13-10 and the resource demands they will exert. This specificity does not reflect a consideration of local resources and needs, as required by the Maximum Extent Practicable (MEP) standard for municipal stormwater discharges. The MEP standard requires consideration of unique local conditions such as receiving waters, size of the community, fiscal resources, hydrology, geology, and capacity to perform operation and maintenance.

Rather than imposing these requirements on small communities and rural counties, the TMDL should describe the six minimum measures more generally and provide them as potential elements to be considered for inclusion in programs tailored to local needs and capabilities. General descriptions of the six minimum measures should not include thresholds (such as land disturbance area for construction site runoff control or post- construction) or treatment levels (such as TSS removal targets). Program elements such as mapping and inventorying hundreds of miles of roadside ditches as part of an Illicit Discharge Detection and Elimination program may not be a good use of resources. Clearly, should an illicit discharge be identified as a source of mercury, it should be controlled. Similarly, regulation of waste materials at construction sites beyond that regulated by the 1200C permit should be left to the discretion of the local government in their development of a TMDL implementation plan dependent on the likely source of mercury.

This requirement is especially significant for large counties with broad geographic jurisdiction. Counties covering broad geographic areas will need to coordinate on the six minimum measures within the urban growth boundaries of multiple cities and towns with a range of existing programs (or no programs at all, currently). This presents practical implementation challenges that take time to work through. Also, implementation of the six minimum measures in counties with large geographic areas essentially imposes an urban stormwater management program on largely rurally zoned lands (e.g., rural residential, rural commercial/industrial, etc.). The six minimum measures that are the basis of the MS4 Phase II NPDES permitting program were originally written and intended for managing runoff from urbanized areas. The imposition of these measures in a rural context lacks scientific support and poses a significant risk of unintended consequences and counterproductive actions. We do not think it is appropriate to use the Mercury TMDL as a mechanism for obtaining what is essentially MS4 Phase II NPDES permit coverage watershed wide. Given the largely rural extent of these areas, and the range of actions required to implement the six minimum measures, significant time and resources would be necessary to develop and implement storm water programs for runoff from rural lands without significant impact on or benefits for water quality.

What is the purpose or benefit of extending urban based measures to a rural area? What non-point source would we need to identify? The make-up of Benton County is such that our small staffing levels would be

stretched even further as we traverse the county implementing the measures that have very little, if any benefit.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

B_RP#10: Suggested Change ID #241

Description: WQMP - 13.3.1.17, Clean Water Services

Comment: Section 13.3.1.17, Clean Water Services: a. The District and 12 co-implementers implement a single Stormwater Management Plan only within the urban portions of Washington County, which is a much smaller area than the Tualatin Basin in the county. The first paragraph of this section should be corrected.

a. This section begins by affirming that the District's MS4 permit serves as its TMDL implementation plan for the MS4 area (i.e., point sources). Then, repeating a requirement from 13.3.1.11, it requires the District to update its TMDL implementation plan to ensure inclusion of measures to reduce runoff and erosion that discharge directly to waterbodies (i.e., nonpoint sources), and to post its nonpoint source implementation plan on its website.

The District applies the MS4 programs (including those to control erosion and runoff from construction sites, to eliminate illicit discharges, and to regulate industrial and commercial facilities) to nonpoint (non-MS4) discharges under the District's authority to manage surface waters in its jurisdiction. In addition, the District requires riparian protection and restoration as part of development outside of the MS4, and performs riparian corridor work and stream restoration outside the MS4 to improve water quality. The District will develop a TMDL implementation plan documenting the measures to address nonpoint sources of stormwater discharge, covering the District and co-implementers.

Response: DEQ revised language in Clean Water Service's section to clarify that the MS4 permit applies to urban areas of Washington County and not throughout the Tualatin Basin.

DEQ staff will work with Clean Water Services following the issuance of the Mercury TMDL to ensure that all WQMP requirements for nonpoint sources of mercury will be met in a revised TMDL implementation plan.

B_RP#11: Suggested Change ID #242

Description: WQMP - 13.3.1.22 editorial

Comment: 7. Section 13.3.1.22, Reservoir management: The introductory paragraph to section 13.3 on page 78 states, This section of the plan describes management measures, as required in 340-042-0040(4)(1)(C), to reduce loadings of mercury to Willamette Basin waterbodies to meet TMDL load and wasteload allocations. It is organized by nonpoint and point source DMAs and responsible persons. For

some of the DMAs, DEQ included a list of management measures as an implementation or "good practice" baseline. The list is not intended to be comprehensive or prescriptive and DMAs and responsible persons may propose alternative approaches or management strategies.

Since Table 13-19 is titled "Examples of Best Management Practices," it seems that the BMPs in Table 13-19 are not intended to be prescriptive and that DMAs may propose alternatives as provided in the quoted paragraph. However, the sentence at the top of page 111 refers to these BMPs as "requirements." That sentence should be revised to refer to the examples of reservoir BMPs that DMAs may consider in developing their management strategies.

Response: DEQ clarified that the table titled "Examples of Best Management Practices" are not intended to be prescriptive.

B_RP#12: Suggested Change ID #243

Description: WQMP - Editorial - 13.3.2.1.3 remove permit implementation tools

Comment: 8. Section 13.3.2.1.3, Additional NPDES wastewater permit implementation tools: Since the WQMP does not recommend including effluent limits in NPDES discharge permits, this section on variances and intake credits is not relevant and could lead to confusion. DEQ should remove this section from the final WQMP.

Response: DEQ agrees with the comment and removed Section 13.3.2.1.3.

B_RP#13: Suggested Change ID #244

Description: WQMP - MS4 submittals - do not require multiple submittals of SWMP to address mercury

Comment: 9. Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System: This section requires the inclusion of specified terms in MS4 Phase I permits upon renewal to implement the TMDL. The first bullet requires a mercury minimization section within the "Stormwater Management strategy." Presumably this refers to the permittee's Stormwater Management Plan (SWMP), not a separate document. Given the comprehensive nature of SWMPs, a second, redundant document should not be required. This section should be clear that it refers to the SWMP.

Including new requirements to create a separate mercury plan/update of the existing Stormwater Management Plan outside of the typical permit renewal cycle is an inefficient use of already limited time for both MS4 and DEQ staff and serves no environmental benefit, as DEQ already has copies of our documents. We request that DEQ use the same permit renewal and reporting cycle required for the MS4 permit be utilized for any language updates needed to specifically satisfy the Mercury Water Quality Management Plan, as we do not see new or additional information that we have/can provide beyond what is extensively documented and reported to DEQ annually.

It's unclear if the "mercury minimization section" referenced here is intended to be a stand-alone submittal, part of an annual report, or a Stormwater Management Plan (SWMP) revision. The latter is inappropriate. A new SWMP is generally required upon re-issuance of the MS4 permit, so this provision

as written would force permittees to revise their SWMPs within two years of having drafted an entirely new SWMP, which is a very resource-intensive process and technically constitutes a permit modification. The SWMP comprehensively addresses all pollutants associated with stormwater runoff (including and especially sediment), so creating a duplicative or obsolete section within the SWMP that repeats all the existing pollution reduction strategies simply is not useful. Please modify language in the first bullet as noted to clarify this as a stand-alone submittal along with, or as part of, the second annual report.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language in Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System.

B_RP#14: Suggested Change ID #245

Description: TSD - Table 5-9 average flows

Comment: Table 5-9: Table 5-9 apparently includes a mix of actual and design flows presented in the "Average Flow" column. Actual and design flows can differ substantially. Since the purpose of the evaluation is to estimate current mercury loads, it would be more appropriate to use actual flows rather than design flows.

Response: DEQ compiled submitted flow monitoring records and provided the compiled data to EPA's contractor, Tetra Tech, to be used for establishing existing mercury loads. If available, actual effluent records were used to estimate an average annual discharge for a facility. However, no flow records were available for the four Clean Water Services facilities: Durham, Forest Grove, Hillsboro, and Rock Creek. Therefore, flow information submitted to DEQ in 2017 as part of the variance applications for the four Clean Water Services wastewater treatment plants was applied. This is discussed in Section 5.3.5 POTW Sources in the TMDL Technical Support Document and presented in the table notes for Table 5-9. The TMDL Technical Support Document was revised to further clarify the use of design flows for these select facilities.

B_RP#15: Suggested Change ID #246

Description: TMDL Target - Northern Pikeminnow

Comment: Target Fish Species: The District continues to have concerns with the use of the Northern Pikeminnow as the target fish species in the TMDL, particularly around communication to the public. Unfortunately, the primary message to the public is likely to be that fish in the Willamette River are highly contaminated and should not be consumed, which is not an accurate or appropriate message. To convey a more accurate picture of fish consumption considerations in the Willamette River basin, DEQ should reconsider the use of a fish that is not widely consumed. Additionally, the use of the Northern Pikeminnow as the target fish species establishes an unrealistic goal for the TMDL. DEQ should use more widely consumed fish to provide more meaningful and realistic shorter-term goals for in-stream mercury concentrations, perhaps with longer term targets for other fish.

Response: Commenter is referred to the discussion of the Northern Pikeminnow in Section 11 Margin of Safety for justification of its selection.

B_RP#16: Suggested Change ID #247

Description: Modeling - input clarification

Comment: Stormwater modeling: DEQ should provide more information in the Technical Support Document on the approaches and data used for stormwater modeling. In particular, the areas used for MS4 modeling should be provided, along with the jurisdictions used in the model, the impervious areas and estimated effective impervious area used. Understanding these model inputs is critical for developing benchmarks and conducting future PLREs and WLAAs. Having these inputs will allow meaningful comparisons to the modeled current loads.

Response: Spatial data used in the MS4 modeling will be made available from DEQ websites with the issuance of the TMDL and provided to DMAs for use in implementation.

B_RP#17: Suggested Change ID #296

Description: WQMP - MS4 Phase 1 co-permittees should not be required to submit individual TMDL Implementation Plans

Comment: Section 13.3.1.11.1 requires MS4 permittees to develop and submit TMDL implementation plans demonstrating how nonpoint source load allocations will be met, including management strategies to reduce runoff and erosion that discharge directly to waterbodies. Under an approach long recognized by DEQ, the District is the stormwater authority for urban Washington County, with Washington County and the cities of Banks, Beaverton, Cornelius, Durham, Forest Grove, Hillsboro, King City, North Plains, Sherwood, Tigard, and Tualatin recognized as co-implementers, along with the District, of a single, comprehensive Storm Water Management Plan. The District is the sole MS4 Phase I permittee for discharges from the MS4 in urban Washington County to waters of the state. Although not permittees, the 12 co-implementers are covered by the District's MS4 permit, as correctly described in Table 9-5 and noted in Appendix E. To be consistent with this established structure, the WQMP should not require individual TMDL implementation plans or nonpoint source plans from each of the co-implementers, rather the TMDL should allow a more comprehensive approach.

Response: DEQ acknowledges Clean Water Service's status as the stormwater authority for urban Washington County. It is not necessary for the eleven co-implementers to develop separate TMDL implementation plans to include required mercury actions following the issuance of this TMDL, as long as CWS continues in this implementation role. DEQ added language to the WQMP based on similar comments to clarify that jurisdictions can continue partnering with other entities to meet TMDL requirements. If jurisdictions pursue these partnerships, DEQ encourages cities and counties to have formal agreements in place to ensure requirements are met given their legal status as a DMA. Please include these details in the TMDL implementation plan.

B_RP#18: Suggested Change ID #300

Description: WQMP - MS4 PLREs and WLAAs should both develop benchmarks and be conducted in the second permit cycle

Comment: Section 13.3.2.2.1 - MS4 Phase 1 requirements - The last bullet requires submittal of a pollutant load reduction evaluation (PLRE) and Wasteload Allocation Attainment Analysis (WLAA). The previous bullet acknowledges that there are insufficient data to develop benchmarks Since the same data used to create benchmarks would be required to conduct both the PLRE and WLAA, these analyses should be treated the same as the requirement to develop benchmarks. That is, that benchmarks, PLREs, and WLAAs should not be required in the first permit cycle. Instead, the permit should require collection and submittal of mercury data during the first permit cycle. The benchmarks should be established and PLRE and WLAA should be conducted in the second permit cycle.

Response: DEQ clarifies that development of benchmarks is not required for evaluation of non-structural controls. DEQ included the statement "due to data limitations, mercury benchmarks are not applicable in the first permit cycle after the TMDL is finalized" to acknowledge that initial data sets may not be adequate for developing mercury benchmarks for evaluation of structural controls. However, qualitative evaluation, as required for non-structural controls, is expected in reporting of pollutant load reduction evaluations and wasteload attainment analyses during the first permit cycle following issuance of the TMDL.

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47. Comments from: Christensen, Vivian

Ch_V#1: Suggested Change ID #368

Description: WQS - Prioritize health of Oregonians when updating allowable mercury emissions

Comment: Comment states the deleterious effects of mercury on land, air and water quality and human health and asks DEQ to prioritize health over profits by setting stricter mercury emissions standards.

Response: DEQ agrees that mercury can have deleterious effects and believes that requiring DMAs to develop and submit measurable objectives and milestones related to the implementation of this TMDL will result in water quality benefits.

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48. Comments from: Sweeney, Sam

Sw_S#1: Suggested Change ID #112

Description: Source Assessment NPS Atmospheric, groundwater, soil mercury - difficult for ODA and partners to differentiate between the natural and human causes of erosion and mercury

Comment: Section 6.2, Table 6-7, p. 42 In summary, the following Nonpoint Sources may impact agricultural activities: Surface Runoff of atmospherically deposited mercury: Estimated Load of Total Mercury (g/day) 118.0; Relative Contribution to Total Load 32.7% Groundwater: Estimated Load of Total Mercury (g/day) 60.6; Relative Contribution to Total Load 16.8% Erosion of mercury containing soils: Estimated Load of Total Mercury (g/day) 154.6; Relative Contribution to Total Load 42.8%

ODA Comment: Both the Nonpoint Sources (NPS) of surface runoff of atmospheric mercury and erosion of soil mercury estimates are substantial. Both of these sources of mercury result from natural and human-caused erosion. It will be difficult for ODA and partners to differentiate between the natural and human causes of erosion.

Chapter 9, Section 9.2, p. 48 This section notes that a significant portion of the mercury in the Willamette Basin is deposited atmospherically. Figure 5-19 of the TMDL Technical Support Document indicates that 86 percent of surface runoff and 91 percent of sediment erosion may be affected by the natural and human activities within the forestry, agriculture and urban development land use areas.

ODA Comment: ODA does not have the capability to differentiate between natural and human sources of mercury. ODA will not be able to identify or separate the contribution of sediment and mercury of agriculture from other sources.

Response: DEQ acknowledges that differentiating between varied nonpoint sources of mercury and sediment is challenging. In order to help address this, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. This strategy will help DEQ characterize water quality trends within HUC8 watersheds. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading. DEQ encourages ODA, other state agencies, and watershed partners to be collaborative partners in future monitoring efforts in the basin.

Sw_S#2: Suggested Change ID #175

Description: WQMP - DMA designation

Comment: It is appropriate for the Oregon Department of Agriculture (ODA) to be listed as a DMA and to continue implementing the Agricultural Water Quality Management Program (under SB 1010) within districts. ODA's program ensures there is clarity for individual farmers and ranchers on what requirements need to be followed and what steps can be taken to achieve compliance. Under ORS 568.930, landowners within boundaries of water quality management area plans are already required to comply with plan rules, regardless of whether they are receiving water from an irrigation district or similar entity and are subject to penalties if they do not comply. ODA has educational tools and technical assistance to provide landowners and operators to help resolve water quality issues. ODA also has the authority to take enforcement action against landowners and operators who do not voluntarily comply with water quality standards, implementation plans, and related area rules. Oregon farmers are doing what they are required to do in the individual river basin plans.

Response: DEQ agrees that ODAs agricultural water quality program is helping to ensure TMDL implementation related to agricultural activities and farming practices.

Sw_S#3: Suggested Change ID #303

Description: WQMP - Implementation Plans - global sources

Comment: In Timeline for Attainment section, ODF appreciates the recognition of global mercury emissions and air deposition as the primary mercury source in Oregon. Messaging to other entities (local, regional, national, global) about this issue is important.

Response: DEQ agrees with the comment.

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49. Comments from: Bielenberg, Dave of East Valley Water District

B_D#1: Suggested Change ID #33

Description: WQMP - Responsible persons - Remove or add entity to the TMDL as a responsible person

Comment: Remove or add entity to the TMDL as a responsible person

Response: The Creswell Water Control District has jurisdiction to operate water flow from a drainage system that discharges to the Coast Fork Willamette River, a major tributary to the Willamette River.

B_D#2: Suggested Change ID #111

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #1

Comment: We are concerned the lack of clarity and potential negative impacts related to the role of irrigation districts and similar entities in implementing water quality standards will lead to increased conflict and costly litigation rather than collaborative partnerships necessary to achieve measurable water quality improvements.

Response: DEQ must address the elements of a TMDL described in OAR 340-042-0040 (4) (a-l) in order to meet the rule as well as to attain approval from EPA. One of the elements required in a TMDL is, "Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans," (OAR 340-042-0040 (4) (G). DEQ has authority to identify persons responsible for implementing the TMDL, which includes but is not limited to DMAs. DEQ uses the term "responsible

persons," to identify "persons…responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans."

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

B_D#3: Suggested Change ID #114

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #2

Comment: OWRC represents some, but not all, of the irrigation districts, water control districts, water improvement districts, drainage districts, and other similar entities listed as "water conveyance entities" in the proposed TMDL. Many of OFB's members are members or operators of the aforementioned irrigation and drainage districts. We are supportive of achievable and implementable water quality standards in the Willamette Basin and throughout Oregon, and recognize that DEQ is under stringent, court-ordered deadlines for implementing TMDLs. However, the inclusion of our members as RPs is highly problematic as this new term lacks statutory authority and clarity as to what districts would be responsible for, which unnecessarily and inappropriately places liability on districts and increases the risk of litigation. The lack of clarity also reduces the likelihood that TMDL load allocations will ever be attained.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

B_D#4: Suggested Change ID #117

Description: Editorial - “Responsible person” term not well defined

Comment: The proposed Willamette Basin Mercury TMDL and associated WQMP utilizes the term “Responsible Persons” (RPs), which appears to be a new term that is undefined under either Oregon statute or rule, with uncertain meaning and tremendous potential for legal liability. While DEQ has stated RPs are not Designated Management Agencies (DMAs), the draft TMDL lists water conveyance entities as a “DMA category” (see Appendix E), thereby creating additional uncertainty over what this term means and what implications it has for districts. We agree irrigation districts are not DMAs, which are defined in OAR 340-042-0030(2) as entities “that [have] legal authority of a sector or source contributing pollutants.” However, it is unclear what the legal distinction and potential liabilities are in implementing TMDLs as an RP versus a DMA.

Response: DEQ agrees that the column header in the table shown in Appendix E is inaccurate and the column header was revised to reflect responsible persons as well as Designated Management Agencies.

In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

B_D#5: Suggested Change ID #172

Description: WQMP - Conveyance entities - lack of clarity about responsibilities of RPs #3

Comment: The inclusion of irrigation districts, drainage districts, and similar agricultural water suppliers as generic "water conveyance entities" also fails to acknowledge the separate and distinct statutory authorities and responsibilities of each type of entity. There are significant differences in not only the authorities, but the specific purposes for which different districts were formed under ORS chapters 545, 547, 552, 553, and 554. For example, irrigation districts are formed most commonly by a group of farmers for the purpose of delivering water to farms and other agricultural water users. Drainage districts are similarly formed by a group of farmers for the purposes of delivering water away from farms. In either circumstance, our members manage the conveyance of water and have limited or no control over the quality of the water they receive or deliver. While we do not represent all of the entities listed, we are not aware of any information that justifies any of the forty-seven entities being listed as RPs without further clarification.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

B_D#6: Suggested Change ID #173

Description: WQMP - Entities lack statutory authority, which also means reasonable assurance is not met

Comment: Irrigation districts, drainage districts, and similar entities generally lack statutory authority to manage the quality of the water they deliver. They are responsible for performing certain water management functions for their assessed district patrons, most commonly operations and maintenance of water delivery infrastructure. These entities are responsible for managing and conveying a quantity of water and are generally not responsible for, nor do they have the statutory authority, to manage the quality of the water they deliver. Districts lack both the authority and resources to implement water quality measures for mercury or other pollutants. There are currently no methods, resources, or authority for districts to reduce mercury in water. Not only do irrigation districts, drainage districts, and similar entities lack authority to manage water quality, they also lack statutory authority to compel compliance by member patrons and are not responsible for the land management activities of individual water users within districts. In the Willamette Basin and throughout Oregon, districts regularly engage with their local Soil and Water Conservation Districts (SWCDs). They provide their water users with information and resources available from local SWCDs as well as the Natural Resources Conservation Services (NRCS). However, districts are generally not legally authorized, nor possess the financial means, to implement or enforce water quality improvement measures upon the individual farmers within their districts, and not all of them have the requisite knowledge and experience to convey information about these programs to their patrons.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

B_D#7: Suggested Change ID #174

Description: WQ Impairments - No evidence that district activities contribute to mercury in basin

Comment: There is no evidence that district activities directly contribute to mercury loads and therefore are unlikely to have any impact on the amount of mercury in the Willamette Basin.

Response: DEQ acknowledges that the TMDL does not include data specific to water conveyance entities. In other words, there are no system- specific data available to support inclusion or exclusion of water conveyance entities from the TMDL. An important element of this TMDL is to at a minimum identify where these systems exist on the landscape and what maintenance and operations activities are implemented within these systems. This represents progress toward a better understanding of the potential impact of water conveyance systems on water quality. DEQ identified these entities as responsible persons because of their process, practice, activity or resulting condition may contribute mercury.

B_D#8: Suggested Change ID #176

Description: WQMP - Funding of RPs

Comment: In addition to the lack of clarity and authority, irrigation districts and similar entities do not have resources to implement the proposed TMDL and related WQMP. Many of the proposed RPs are small districts with little or no paid staff. These small entities lack the financial resources and management structure to implement the proposed WQMP, increasing the likelihood of non-compliance. Even entities with staff struggle with understanding what role their particular district has in addressing mercury TMDL allocations. Our organizations remain committed to conducting outreach and education to our respective members, but we are extremely concerned about the potential unfunded regulatory burden being placed on these entities.

Response: DEQ acknowledges the fiscal impact to all entities responsible for implementing the TMDL. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to coordinate and collaborate on implementation in order to improve implementation efficiency as well as reduce/ share costs when feasible.

B_D#9: Suggested Change ID #178

Description: WQMP - Conveyance entities - How to separate sedimentation resulting from conveyance systems from that resulting from upland agricultural activities

Comment: Specific to impacts due to modeling used in the load allocations impacting our members, it is worth noting that while DEQ states water conveyance entities "are responsible only for sedimentation resulting from conveyance systems, not from upland agricultural activities," it is unclear how this separation will be made since there is no data allocating mercury to alleged water conveyance activities versus upland agricultural activities. We are concerned this approach may lead to conflict between the named entities, stymieing the types of collaborative partnerships and projects needed to make real progress in improving Oregon's water quality.

Response: DEQ is not requiring water conveyance entities to conduct water quality monitoring at this time, however they will be responsible for submitting TMDL implementation plans to DEQ that clearly show best management practices are/ will be utilized to reduce erosion and sediment movement during operation and maintenance of the system. Water conveyance entities that fully implement their DEQ-approved TMDL implementation plan will be considered to be in compliance with the TMDL.

In addition, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under authority or control by DMAs or responsible person, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

B_D#10: Suggested Change ID #179

Description: WQMP - Responsible persons - Clarify responsibility of RPs

Comment: In summation, OWRC and OFB appreciate DEQ's ongoing efforts to protect Oregon's water quality, but we have significant concerns about the proposed implementation approach. Placing additional unclear and unfunded mandates upon irrigation districts and similar entities will only lead to additional conflict and litigation rather than improved conditions. We continue to be supportive of irrigation districts and similar entities actively participating in collaborative, basin-wide efforts through local SWCDs and working with appropriate DMAs like ODA. While a long-term solution is needed, at the very least, we urge you to clarify that irrigation districts and similar entities are not responsible for developing or implementing water quality management plans related to activities not within their scope of operations, control, or legal management authority. Your time and consideration of our comments is greatly appreciated.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

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50. Comments from: Carlin, Jayne of EPA

C_J#1: Suggested Change ID #52

Description: Beneficial Uses - protection of aquatic dependent wildlife

Comment: EPA recommends that ODEQ include analysis or references/data/studies that support its position that achieving the mercury human health criterion in fish tissue will also protect aquatic dependent wildlife.
Pages 11-12, 14, 23

Response: The Environmental Quality Commission adopted numeric mercury water quality standards for the protection of beneficial uses identified for the Willamette Basin. In addition, the EQC adopted a narrative water quality standard for toxic chemicals. In July 2017, EPA approved California's statewide water quality standards for mercury in fish tissue for the protection of aquatic life and wildlife dependent species. The approved prey fish objective for protection of wildlife was 0.05 mg MeHg/kg fish. DEQ's opinion is that wildlife species present in Oregon are similar to those in California and would not be more sensitive to mercury exposure. Based on this EPA action in California, and that the EQC has not adopted fish tissue numeric criteria for Oregon, DEQ anticipates the Oregon fish tissue criterion of 0.04 mg MeHg/kg fish would be protective of human health and wildlife uses.

C_J#2: Suggested Change ID #53

Description: General - waterbodies listed for mercury

Comment: Table 1-1 and page 2, 14, 17. The State indicates that the TMDL covers all perennial and intermittent streams in the Willamette River Basin (WRB) including the mainstem Willamette and Middle Fork Willamette. While EPA supports the State's comprehensive application of the TMDL, EPA's ultimate approval/disapproval can only apply to those waterbodies listed for mercury on its most recent (2012) Section 303(d) list of waters needing a TMDL.

Response: DEQ acknowledges that EPA's action will only apply to those waterbodies listed for mercury based on the 2012 section 303(d) list of waters needing a TMDL. DEQ appreciates EPA's acknowledged support of DEQ's watershed approach in developing a basin-wide TMDLs. For Willamette Basin mercury reductions, the watershed approach is anticipated to be particularly effective, given widespread air deposition of mercury as the driving source. It is DEQ's understanding that, following EPA approval, any waterbody within the Willamette Basin where future data shows is impaired for mercury, and the state's water quality standards have not changed, will not require a TMDL, and will be designated a Category 4A – TMDLs needed to attain applicable water quality standards have been approved.

C_J#3: Suggested Change ID #54

Description: Beneficial uses - questions from EPA

Comment: Section 2, page 23. The last two sentences in the last paragraph of the Beneficial Uses section state: "To determine if there is risk to human health from consuming mercury in fish, Oregon Health Authority first compares mean concentration found in tissue of a particular species to current screening values of 0.2 mg/kg for vulnerable populations and 0.6 mg/kg for the general population (Oregon Health Authority, 2016; Hillwig, 2019). This is similar to the value used (0.35 mg/kg) for the fish consumption advisories in place for the 2006 TMDL."

Is there an averaging period for these screening values (ex. 0.35 mg/kg over 2 months)? Also, as presented the defined action levels listed to establish a fish consumption advisory are much less protective than DEQ's water quality criterion. Is this correct? Do these values create a greater risk to the targeted population for which the State's revised fish tissue criterion is intended to protect?

Response: The Oregon Health Authority is the state agency responsible for issuing fish consumption advisories based on contaminant concentrations in fish. DEQ is the state agency that is responsible for developing water quality standards to protect the applicable beneficial uses of a waterbody. Although DEQ does review fish consumption advisories for mercury as a basis for listing a waterbody on the state's 303(d) list of impaired waterbodies, the overarching goals between these two evaluations differ. DEQ developed the methylmercury fish/shellfish tissue standard of 0.040 mg/kg to protect the beneficial use of "fishing", which allows people to safely consume up to 175 grams of fish per day (or about 23 8-oz fish meals a month) over their lifetime. The TMDL was developed to meet the beneficial use of "fishing", rather than how much fish are safe to eat based on the amount of mercury already present in fish tissue. Therefore, comparing OHA's methodology for issuing mercury fish consumption advisories to DEQ's water quality standard is not an appropriate comparison. DEQ added language to the TMDL document to clarify this important distinction.

C_J#4: Suggested Change ID #55

Description: WQ Standards - ensuring Washington's criteria for mercury will be achieved

Comment: Section 2 pages 23, 24. The Willamette River discharges to the Columbia River, which is a waterbody shared with the State of Washington. For that reason, the narrative should describe how the TMDL ensures that Washington's criteria for mercury will be achieved at the state boundary.

Response: It is the State of Oregon's policy to meet the water quality standards of a downstream state. The Columbia River is a shared waterbody with the State of Washington at the mouth of Willamette River, so DEQ considers Washington to be a downstream state.

The state of Washington's methylmercury fish tissue criterion, along with numerous other human health criteria were promulgated by EPA in November 2016 and reside in 40 CFR 131.45. Washington State's methylmercury fish tissue criterion is 0.03 mg/kg is slightly more stringent than Oregon's fish tissue criterion of 0.040 mg/kg. Although Washington state's criterion is slightly more stringent, the modeling to develop the TMDL's water column surrogate of 0.14 ng/L to meet the fish tissue criterion was based on several conservative assumptions some of which were used for the implicit margin of safety and others that were used to be protective of the resource and address all listings in the basin. A margin of safety is expressed as unallocated assimilative capacity. Whereas conservative analytical assumptions used in establishing the TMDL were used for additional protections and assure protection of the resource. These include:

Implicit Margin of Safety 1) Use of the Northern Pikeminnow This fish species is the most efficient bioaccumulator of mercury among the species considered. Furthermore, the Northern Pikeminnow is not a popular commercial or recreational target. Instead, pikeminnow may be consumed on an occasional basis by recreational or substance fishermen.

Conservative Assumptions

1) Use of the total mercury median concentration. The food web model used the TMDL target concentration of total mercury. The statistical distribution for the Monte Carlo simulations of the Food Web Model was right-skewed and use of the median as a measure of central tendency results in a lower surrogate value than the average concentration.

2) Use of total mercury concentration in fish tissue. The modeling assumed all the mercury in fish tissue was total mercury, rather than methylmercury in fish tissue. Total mercury concentrations in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concertation in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration.

Dilution 1) The Willamette River discharges to the Columbia River. The Willamette River has less flow than the Columbia River with the following dilution factors of: minimum = 2.5; median = 11.2; maximum = 43.6. Therefore, water from the Willamette would be diluted by 1 to 2 orders of magnitude below the Willamette Mercury TMDL total mercury targets and therefore would be protective of the downstream state's water quality standard.

Based on the above conservative assumptions and the dilution factors, DEQ anticipates that the TMDL total concentration of mercury inwater surrogate of 0.14 ng/L is sufficient to meet the state of Washington's methylmercury tissue criterion, which is applicable downstream of the Willamette River on the Columbia River.

C_J#5: Suggested Change ID #56

Description: General - include more information on Hg cycling

Comment: Section 5.1, page 27. Include information that specifically focuses on what is known and unknown about Hg cycling in the Willamette Basin. For example, information could be included that discusses what is known about the percent of Hg that is particulate bound in the Willamette Basin under current conditions since the TMDL has a large emphasis on reducing erosion. Include this information in Chapter 1 or 7.

Response: DEQ did not make changes to Section 5.1. This section was authored by Chris Eckley, EPA's mercury expert, and contains a compilation of the most recent literature explaining the highly dynamic and complex behavior of mercury as it cycles though the environment. Little information is available specific to mercury cycling in the Willamette Basin or local percentages of particulate bound species. As noted in Section 1.2.1 of the TMDL Technical Support Document, 2006 modeled load estimates were largely dependent on the assumptions for total mercury delivery ratios (for atmospheric deposition) and sediment delivery ratios (for soil erosion). A more elaborate modeling effort in 2019 aimed to improve the estimates, but uncertainty in the underlying assumptions persists, despite the many validation and calibration efforts described in Sections 3, 4 and 5 of the TMDL Technical Support Document. DEQ retained the 2006 focus on control of erosion as the chief mechanism for reducing mercury transport to streams in the Willamette basin, not because of information confirming specific particulate binding percentages, but due to the overwhelming majority (>95%) of basin sources being associated with soils (either through soil content or via deposition onto soils).

C_J#6: Suggested Change ID #57

Description: Modeling - Mercury Translator Equation

Comment: Recommend including the following language in section 6.1.2 on page 32: "In the Willamette Basin, on average only X% of the total mercury is methylmercury. Therefore, the majority of total mercury is in an inorganic form." In some systems, methylmercury can be a large percent of total mercury therefore the statement that "total mercury supplies the pool…for methylation" would not be accurate. The term "total mercury" here is being used to refer to non-methylated forms of mercury, or inorganic mercury. But this is not explicitly stated.

Response: DEQ has updated the discussion in the TMDL to the following (first paragraph of Section 6.1.2):

DEQ used the information from the Food Web Model to relate total mercury concentrations in water to dissolved methylmercury in fish tissue for higher trophic level fish species. Based on paired samples in the Willamette River Basin, about five percent of the total mercury concentration observed in water is methylmercury. Therefore, a majority of total mercury is inorganic, however, under certain environmental

conditions, methylation can occur converting stored inorganic mercury to methylmercury. A total mercury concentration target is established for the TMDL to reduce methylation potential and because loads from sources in the basin are predominately in the inorganic mercury form.

In the same manner in the 2006 TMDL, DEQ used an empirical translator equation to relate dissolved methylmercury and total mercury in water column. The translator was applied to estimate target total mercury concentrations based on critical dissolved methylmercury exposure concentrations for different fish species. DEQ used this empirical relationship to represent the complex, non-linear methylation process that depends on temperature, carbon, sulfur, reduction/oxidation conditions, and other variables. The details of the translator equation development are given in Section 4 of Appendix A: Technical Support Document.

C_J#7: Suggested Change ID #58

Description: Modeling - Describe what "potency factors" are and how they are derived. Provide references or details for re-emission and retention rates

Comment: Section 6.4.1.2, page 40. The third sentence in the first paragraph in this section states that "The method used to account for the mercury level from soils was to estimate potency factors for use in the Mass Balance Model". This is followed by: "The potency factors varied with geology, soil properties and land use type. The main effect of land use was the retention and re-emission rates related to the vegetative cover (e.g. forest, shrub, or cultivated land). Using this approach, several potency factors for soils were estimated and are listed in Table 6-6."

This is the first time in the text that the idea of "potency factors" is introduced. It is unclear what they are or how they were derived. Additional text should be added to explain these and/or a reference should be provided where more information is available. Additionally, from the text it sounds like re-emission and retention rates were used for each land use type to calculate potency factors. What re-emission rates were used for this purpose? A citation or additional detail should be provided.

The same paragraph included the following sentence: "There was not a sufficient amount of data to determine whether there was significant variation between HUCs for land cover other than forest or shrub and single values were used for each land use for the entire basin."

It is unclear what data is needed to calculate a potency factor. What is the source of this data for forest and shrub lands and why is it not available for other land uses? And if potency factors are addressed in the TMDL's draft Technical Support Document, then it would be helpful to refer the reader to the applicable section and/or page number.

Response: The Technical Support Document Section 5.3.2 discusses soil Hg model input development, including soil potency factors (mass of mercury per mass of sediment expressed as uk/kg). DEQ has revised the TMDL with a reference to the Technical Support Document and a definition of potency factor.

C_J#8: Suggested Change ID #59

Description: Loading Capacity - address inconsistencies

Comment: Section 7 states that the THg loading capacity is 42 g/d and that the THg excess load is 318 g/d. However, on the preceding page in Table 6.7 the total load is presented as 361.3 g/d. 361.3-42=319, not 318. This is potentially due to roundoff, however, the excess load listed as a bullet on page 43 (318 g/d) and existing load listed in Table 6-7 (361.3 g/d) does not match the loads presented in the equations on page 45 (351.42 g/d for the existing load and 309.25 g/d for the excess load). The apparent inconsistencies need to be addressed.

Response: The value "351.42 g/day" for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

C_J#9: Suggested Change ID #60

Description: Loading Capacity - Ensure 0.14 ng/l target will be achieved in Tualatin, Coast Fork, and Lower Willamette subbasins

Comment: Section 7.2, pages 44, 45. To determine a basin wide load capacity, ODEQ calculated a basin wide existing mercury concentration, from which to derive a percent reduction needed to achieve the 0.14 ng/l TMDL target. In estimating the existing basin-wide concentration, the Coast Fork subbasin data were excluded because: 1. the concentrations there were higher than in other subbasins; 2. the mining impacts were unique; and 3. mining related sources are actively being remediated (e.g. Black Butte mine). The resulting basin-wide concentration (1.2 ng/l), is below the median value for the Coast Fork subbasin which is approximately 1.6 ng/l from Figure 7-1. The basin-wide concentration is also below the median concentrations in the Tualatin (0010) and Lower Willamette (0012) subbasins. Consequently, using a median concentration calculated in this way to determine a percent reduction which is applied equally to all subbasins does not appear to be protective of the three subbasins noted above. Because their existing medium concentration values are above 1.2 ng/l, a higher percent reduction appears to be needed in these subbasins in order to achieve the 0.14 ng/l target. Each of these three subbasins includes waterbodies currently 303(d) listed for mercury. For that reason, we believe the TMDL may not be protective in these locations, and that a revised LC and allocation approach is needed to ensure that the TMDL allocations are calculated so that 0.14 ng/l target will be achieved in all subbasins.

The loading capacity and all components (WLA, LA, RC) are defined for the TMDL based on the at-source loads, not the delivered loads. If the TMDL progress is to be evaluated based on observed future loads (derived from water column mercury monitoring {or surrogate measures} and flow at key points of interest in the basin) then future loads will need to be compared to the delivered load capacity, not the at-source load capacity, which equals 28.7 g/day (239.17 g/day existing delivered load reduced by 88%). Individual sources (e.g.., MS4 outfalls) could evaluate their progress using their allocations defined based on at-source loads because the point of evaluation is close-to or at the source, but overall progress must be evaluated using the delivered load, else progress will not be evaluated accurately.

Response:

Summary of DEQ Analysis:

Based on the conservative assumptions used in the basin analysis, DEQ concludes that the basin-wide allocation approach is protective of the Willamette Basin streams and this TMDL will meet water quality standards in the entire basin, including all listed reaches and the HUC8s of the Coast Fork, Tualatin and Lower Willamette. DEQ concludes this based on the following reasons:

- Total mercury medians representing the most current conditions for the Lower Willamette and Tualatin HUC8s are two percent and nine percent higher than the total mercury basin-wide median, as opposed to 44 percent and 59 percent higher using the dataset through 2011. This confirms expectations of in-stream responses due to the significant mercury reduction actions that have occurred since 2011 through implementation of the 2006 TMDL.
- The median total mercury water column target of 0.14 ng/L was used, which is 40 percent lower than the mean concentration of 0.23 ng/L. The State has discretion for interpreting application of water quality standards when not described in the water quality standard. Though using the mean is consistent with the standard developed to protect over multiple exposures and with fish consumption advisory listings, use of the median is more conservative.
- DEQ assigned a higher reduction allocation for legacy mine-related mercury sources. Together with the nonpoint source and point source reductions, the effective reduction requirement in the Coast Fork is 93 percent, which is higher than the basin-wide reduction.
- DEQ opted to use the at-source rather than the delivered loads, as a measure of conservatism in calculating the existing loads, loading capacity, excess loads, needed reductions and allocations.
    - This resulted in 65 percent larger existing loads and, thus, larger reductions needed to meet the in-stream target.
    - DEQ worked with EPA and Tetra Tech to provide an example of this difference in the Tualatin subbasin and demonstrated how some sources in the Dairy Creek watershed require smaller at-source reductions to achieve the 88 percent overall reduction at the outlet of the Tualatin HUC8. This smaller at-source reduction was estimated to be 35 percent less and is therefore conservative in the Dairy Creek and, eventually, the outlet of the Tualatin HUC8.
- EPA's proposed allocation scenarios are disproportionate to source contributions and inconsistent with state discretion in setting allocations in consideration of relative contributions of sources. The proposed allocation scenarios are also not cost-effective or technically or programmatically feasible and are, therefore, unlikely to be implemented. The allocation scenarios are also inconsistent with EPA's 2008 guidance *TMDLs Where Hg Loadings are Predominantly from Atmospheric Deposition* and EPA's 2010 *Guidance for Implementing the January 2001 Methylmercury WQ Criterion*.

In summary, a 40 percent overall reduction due to using medians instead of means; an additional five percent increase in load reductions for the Coast Fork; and 65 percent overall reductions from using at-source instead of delivered loads more than offsets the total mercury median levels for the Lower Willamette and Tualatin HUC8s that are two percent and nine percent higher than the basin-wide median and addresses the unique source reduction needed in the Coast Fork HUC8.

An image of the spreadsheet upon which this comment was based is provided below as Figure 9. When the existing condition is characterized as the median of observed total mercury data by specific HUC8, as EPA suggests, rather than using the basin-wide median, as DEQ did, the TMDL allocated loads are greater than the load capacity for some subbasins. Specifically, the Coast Fork, Tualatin and Lower Willamette subbasin allocated loads exceed load capacities by 35 percent, 67percent and 72 percent, respectively.

Subsequent to providing the above comment, EPA provided example allocation spreadsheets with two potential options of allocations calculated at the HUC8 level for DEQ to consider adopting. DEQ prepared a table comparing DEQ's allocations and those proposed by EPA (see Table 2 below).

<u>DEQ Detailed Response</u>:

Due, in part, to differential limitations in the datasets used in the TMDL models, EPA's suggested use of the dataset at the HUC8 level is not the best approach for describing total mercury existing conditions. DEQ concludes that it is scientifically inappropriate to assign allocations at the HUC8 level with the TMDL approach developed and datasets used for this TMDL. Therefore, and in consideration of the supporting information presented below, DEQ retained the basin-wide approach and analysis for setting basin wide allocations in this TMDL.

A. EPA's statement that the basin-wide median concentration is below the medians of the Coast Fork, Tualatin and Lower Willamette HUC8s implies that the HUC8 medians were calculated from extensive data that were collected at the outlet and listed reaches of the HUC8s. This implication fails to acknowledge that the HUC8 medians are not appropriate to compare to the basin-wide median and that much of the data were collected from smaller streams and tributaries within the HUC8 and not at the HUC8 outlets or listed reaches. DEQ concludes that this comparison simplifies the inherent complexity of the evaluation and weakens the collective efforts of DEQ, Tetra Tech and EPA to increase robustness of the modeling and analytical approach.

B. Subbasin datasets that were used in the models are limited and do not represent current conditions or upstream loads. To estimate existing condition at the HUC8 level, conditions within the listed reach and at the outlet of the HUC8 should be considered. EPA's proposed approach does not do that because of the limited number of data points and the temporal and spatial differences in the dataset. Much of the data used is old (collected prior to 2012) and cannot represent existing conditions at a finer scale than the basin-scale.
    1. In the Tualatin subbasin, there are only 18 total mercury samples. Most were not collected near the HUC8 outlet and none were collected since 2011. To calculate a HUC8-level total mercury median with this limited dataset uses samples from unlisted creeks that are not representative of the listed reaches of the Tualatin or an accurate estimate of total mercury concentrations leaving the HUC8. See Figures 1 and 2 for a map of sample locations and a time-series plot.
    2. The Lower Willamette subbasin includes about 130 datapoints, the bulk of which were collected on Johnson Creek, Fairview Creek and Kelley Creek, none collected since 2011 and the two collection locations farthest downstream are well above the outlet of Columbia Slough and five river miles from the outlet of the Willamette to the Columbia. To calculate a HUC8-level total mercury median with this dataset uses data from unlisted creeks that are not representative of the listed reaches of the Lower Willamette or an accurate estimate of total mercury concentrations leaving the HUC8. See Figures 3 and 4 for a map of sample locations and a time-series plot.
    3. Mercury concentrations in the Coast Fork subbasin dataset reflect the legacy mining concentrated there, and as such, are a poor representation for the basin-wide conditions. As noted in Section 7.2 of the TMDL, the Coast Fork subbasin data were removed for calculating the basin-wide total mercury median.

C. Development of the TMDL Target, Loading Capacity and linked modeling approach was undertaken in close coordination between Tetra Tech, DEQ and EPA, with the implications of these decisions discussed as the process moved forward. Section 7.2 of DEQ's TMDL and Section 4.2.1 of Tetra Tech's TMDL Technical Support Document provide detailed explanations for applying the Food Web Model and Mercury Translator at the basin-scale to calculate the TMDL target. DEQ also applied the basin-wide approach to calculating the loading capacity, excess load and allocations for several reasons. Pooled data at the basin-scale is superior to evaluation at the HUC8-scale because:
    1. Basin-scale water quality data was matched with fish tissue data;
    2. Potential variability due to the known data disparities between HUC8s is addressed; and,

3. Basin-scale data is a better indicator of the central tendency of the data than at smaller spatial scales. Targeting the central tendency of the data is important because we are trying to protect human health from continued and repeated exposures, rather than variable exposure. The basin-wide fish tissue data are consistent with this premise, in that fish tissue concentrations are fairly uniform (with the exception of Cottage Grove and Dorena Reservoirs) and lack high values that represent a risk for acute toxicity. This further supports the use of medians rather than highest concentrations to be protective.

D. DEQ addressed EPA's concern for the potential of some local areas having higher mercury concentrations than the basin-scale median by using multiple conservative assumptions, in addition to the margin of safety. These conservative assumptions are discussed in Sections 6 and 7 of the TMDL. To further address EPA's concern, DEQ undertook additional analyses to quantify some of the conservative assumptions:
   1. DEQ compared using the median of 0.14 ng/L over the mean of 0.23 ng/L as the total mercury water column target to meet the 0.040 mg/kg methylmercury target in fish tissue (see Table 4-4 in the TMDL TSD). This resulted in a water column target that is 40 percent lower and is expected to address any regional differences in the dataset.
   2. DEQ compared using the higher total mercury load distribution within the stream network of 132 kg/yr as opposed to the load delivered to the Columbia River of 87.1 kg/yr (see Figures 5-17 and 5-18 from the TMDL TSD). This 65 percent higher existing load results in greater reductions needed from all source sectors and across all HUC8s to meet the basin-wide water column target. DEQ notes that the difference between at-source and delivered loads varies at the HUC8-level. DEQ evaluated information on At-source and Delivered loads for the Tualatin subbasin provided in Tetra Tech's November 15, 2019 memo on sediment reduction scenarios in the Tualatin which differed by approximately 74 percent (4.13 kg/yr at-source, 3.04 kg/yr delivered). This confirms that applying the conservative basin-wide at-source loads as existing condition to calculate reductions needed allocations is equally or more conservative on the HUC8-scale.
   3. As noted in EPA's comment and shown on Figure 5, the total mercury medians in the three subject HUC8s are slightly above the basin-wide median. However, each is within the distribution of the majority of the data used to calculate the basin-wide median and therefore, need not be treated differently from the rest of the basin. Nonetheless, DEQ evaluated additional total mercury data collected between 2012 and 2019 in the mainstems of the Lower Willamette and Tualatin Rivers (see Table 1 for a summary of data characteristics and Figures 7 and 8 for data locations). To target data representative of listed reaches and HUC8 outlets, DEQ selected sampling locations that were on the mainstems and close to the center of the channel and excluded sample locations near the shores of the rivers. No data from the tributaries in the subbasins were included in this updated dataset because data from side channels and near the influence of tributaries is not representative of the listed reach or the outlet of the HUC8. This updated dataset was not used in the TMDL modeling and improves the understanding of existing condition in these subbasins. As shown in Figure 6 and Table 1, total mercury medians at the outlet of these subbasins are lower than those used in Figure 7-1 of the TMDL and within 2 percent and 9 percent, respectively, of the basin-wide median. The results of this analysis will be provided in the text and appendices of the TMDL.
   4. The unique mining sources in the Coast Fork require prioritization and higher reductions than other subbasins. In Section 10 of the TMDL, DEQ clarified that a higher reduction is required in the Coast Fork subbasin. Legacy mining, which is to most significant source of mercury to the Coast Fork/Cottage Grove Reservoir, requires a 95 percent reduction. Together with the 88

percent general nonpoint source reduction and some stormwater and wastewater point source reductions (75 percent and 10 percent, respectively), an effective reduction of 93 percent is required in the Coast Fork subbasin.

E. DEQ's approach follows EPA's 2008 guidance *TMDLs Where Hg Loadings are Predominantly from Atmospheric Deposition* and EPA's 2010 *Guidance for Implementing the January 2001 Methylmercury WQ Criterion.*

1. DEQ's approach improves on EPA-approved Mercury TMDLs from 25 other states by using a total mercury water column target derived from the methylmercury fish tissue criterion, rather than defaulting to the methylmercury fish tissue target alone. While this adds complexity to the evaluation, it also adds robustness. In addition, measuring reductions in total mercury in the water column will allow DEQ to better understand progress sooner and adaptively manage implementation of the TMDL toward achieving reductions of methylmercury in fish tissue over time.
2. DEQ's TMDL presents "documentation of the approach used to establish linkage between the numeric target and mercury sources, the basis for any assumptions, the strengths and weaknesses of the approach, and the results of any modeling," as required in the 2008 guidance. Sections 5, 6 and 7 of the TMDL explain the necessity of the basin-wide approach, referring frequently to the technical arguments and validation in Sections 2, 3, 4 and 5 of Tetra Tech's TMDL Technical Support Document.
3. EPA's 2010 guidance gives states "discretion in setting allocations and notes that factors to be considered include relative contributions of sources, cost-effectiveness, technical and programmatic feasibility, previous experience with the approach being considered, likelihood of implementation, and past commitments to load reductions." DEQ considered all these factors in setting the allocations. Implementation of the Water Quality Management Plan and the monitoring framework will support effective application of the accountability framework.
4. The 2008 guidance states that "where point sources are contributing a very small amount of the total mercury load, allocation proportional to their relative contribution is typical in approved mercury TMDLs." The revised Willamette Basin Mercury TMDL is using a fish tissue target and the proportion of non-stormwater point source mercury load is < 5%, therefore maintaining allocations in proportion is appropriate.
5. In contrast, EPA's proposed allocation scenarios are disproportionate to source contributions and inconsistent with state discretion in setting allocations in consideration of relative contributions of sources. The proposed allocation scenarios are also not cost-effective or technically or programmatically feasible and are, therefore, unlikely to be implemented.

F. Implementation of mercury reductions has been occurring throughout the Willamette Basin for more than two decades, including significant actions that occurred after collection of the most recent data used in the TMDL analyses (through 2011). Many of these actions occurred in subbasins prioritized for targeted efforts, including the Tualatin, Lower Willamette and Coast Fork so that resulting in-stream responses were not reflected in the TMDL analyses. Some of these actions are listed below and are anticipated to contribute to lower median total mercury concentrations in each subbasin:

1. Clean Water Services continues to implement MS4 stormwater reductions and mercury minimization plans at their four municipal sewage treatment plants that discharge to the Tualatin subbasin. Data collected between 2006 and 2018 from these facilities shows treatment efficiencies of 97% to 99% mercury removal. The data also show significant decreases in

mercury concentrations in biosolids, which confirms decreases in influent concentrations resulting from dental amalgam controls put into place beginning in 2007.

2. In the Lower Willamette subbasin, about a third of the City of Portland is served by a combined sewer system that carries sewage and some stormwater to the Columbia Blvd. Wastewater Treatment Plant for treatment before discharge to the Columbia River. The City of Portland completed this system in phases between 2000, 2006 and 2011 to reduce combined sewage overflows to the Columbia Slough by 99% and to the Willamette River by 94%. Loads of sediment and runoff that potentially contain mercury have also been reduced. Since the majority of mercury data used for TMDL modeling were collected prior to the completion of CSO controls, reductions in mercury since its completion are not reflected in modeling outputs.
3. Also in the Lower Willamette subbasin, DEQ completed four in-water sediment and bank remediation projects after the most current TMDL in-water samples were collected in 2011. Removal, capping and bank stabilization at the following locations reduced mercury, along with other contaminants, that TMDL data does not yet account for: Zidell at River Mile 13.5 to 14 in 2011 and 2012; Central District Greenway at River Mile 14.1 in 2013; and PGE properties at River Miles 13.1 and 13.5 in 2015 and 2016. In addition, other in-water remedial actions are planned and bank stabilization and significant stormwater control projects throughout the Portland Harbor reach (River Miles approximately 2-11) have been implemented since collection of the 2011 data used in the TMDL.
4. Remediation of Furnace Creek at the former Black Butte mercury mine was completed in 2018. Because this source area was contributing a substantial percentage of the mercury load to the Coast Fork, and additional remediation work is planned in Dennis Creek, DEQ anticipates very significant reductions will be reflected in post-remediation data.

In consideration of the supporting information presented in this memo, DEQ concludes that the basin-wide allocation approach is protective of the Willamette Basin streams and this TMDL will meet water quality standards in the entire basin, including all listed reaches and the HUC8s of the Coast Fork, Tualatin and Lower Willamette.

Qualitative Summary of Allocations and Potential Alterations

Fundamentally, treating the calculated basin-scale instream target, which reflects the central tendency of the basin, as a precise value applicable to the subbasins is an extrapolation not supported by the data. However, DEQ undertook a stepwise evaluation to optimize the allocation spreadsheets using potential alteration scenarios that could be considered. DEQ cautions that adoption of any of the scenarios that follow would require careful consideration, particularly in light of departures from the agreed to basin-scale approach to the linked TMDL analyses, the need for substantial additional development of the record and to support reasonable assurance findings.

As noted in DEQ's discussion of conservative assumptions above, using the median of total mercury concentrations in the Northern Pikeminnow (0.14 ng/L) as the water column target is 40 percent more conservative than using the mean (0.23 ng/L). Figure 10 is an image of DEQ's allocation spreadsheet altered to reflect use of the mean, instead of DEQ's conservative approach of using the median. As shown in Figure 10, this scenario shows the allocation is met in the Coast Fork, but post-reduction loads still exceed the allocations in the Tualatin by 45 percent and the Lower Willamette by 54 percent.

Figure 11 is an image of DEQ's allocation spreadsheet altered to reflect both use of the mean Northern Pikeminnow total mercury concentration (0.23 ng/L) and using the more recently collected data in the Tualatin and Lower Willamette subbasins, which is more reflective of current conditions, as discussed in

points D.3. and F. above. The scenario shown in Figure 11 indicates that the allocations are met in the Coast Fork and the Tualatin, but post-reduction load is still exceeded in the Lower Willamette by 20 percent.

Finally, Figure 12 is an image of DEQ's allocation spreadsheet altered to reflect use of the mean Northern Pikeminnow total mercury concentration (0.23 ng/L), the more recently collected data in the Tualatin and Lower Willamette subbasins and increasing the atmospheric deposition allocation requirement from 11 percent that DEQ used in the TMDL to 70 percent. The scenario shown in Figure 12 meets the calculated allocations in all subbasins.

Supporting Figures and Tables

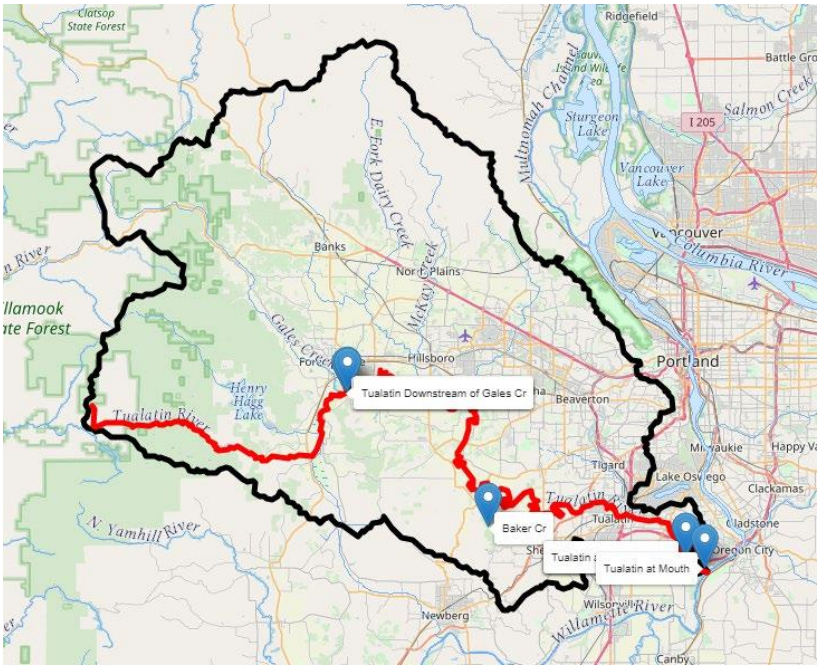

Figure 1. Locations of sample locations of total mercury observations used in the Willamette mercury TMDL in the Tualatin HUC08.

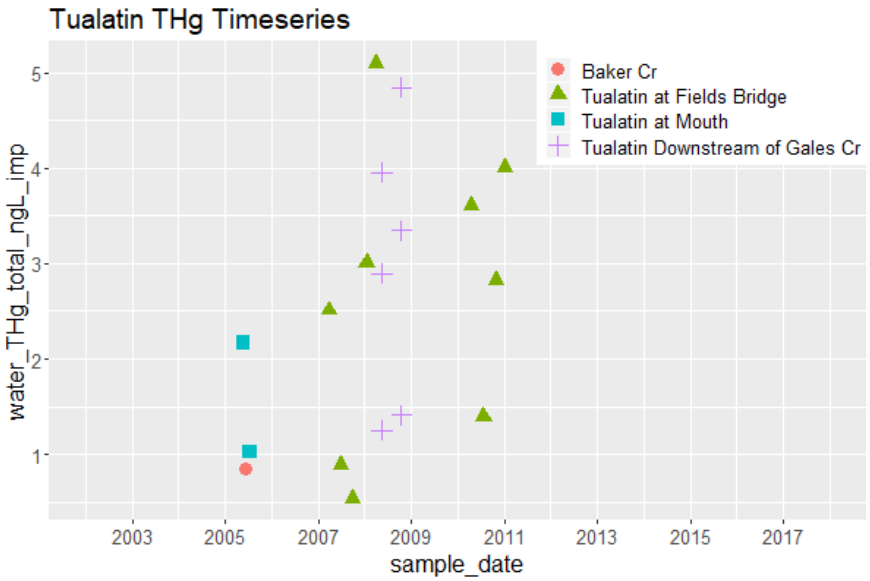

Figure 2. Time-series plot of total mercury concentration observations from the Tualatin HUC8 used in Willamette mercury TMDL. (Note: Observation from Baker Creek was not used in calculation of median total mercury for Tualatin HUC08.)

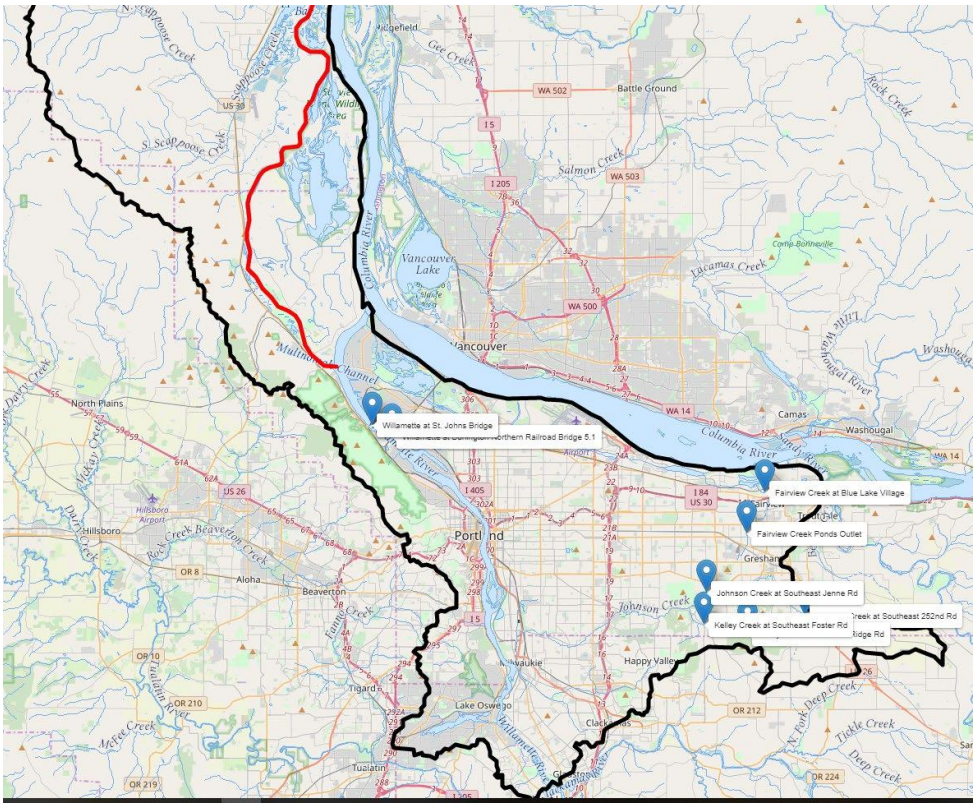

Figure 3. Locations of sample locations of total mercury observations used in the Willamette mercury TMDL in the Lower Willamette HUC08.

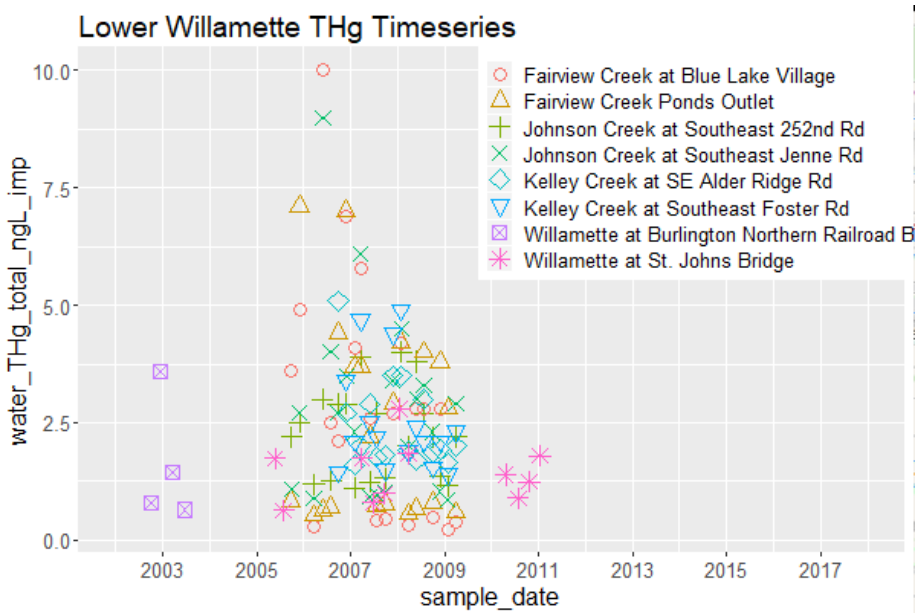

Figure 4. Time-series plot of total mercury concentration observations from TMDL the Lower Willamette HUC08 used in Willamette mercury TMDL.

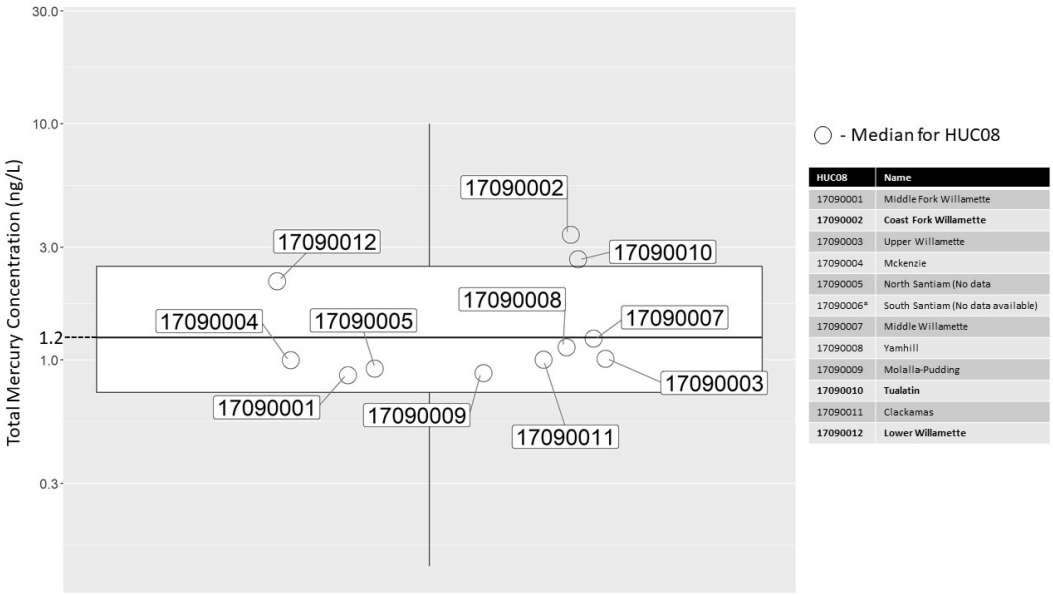

Figure 5. Comparison of the individual medians of the HUC08 total mercury data to the distribution of the data represented by the boxplot of the data used to calculate the basin-wide existing condition of 1.2 ng/L.

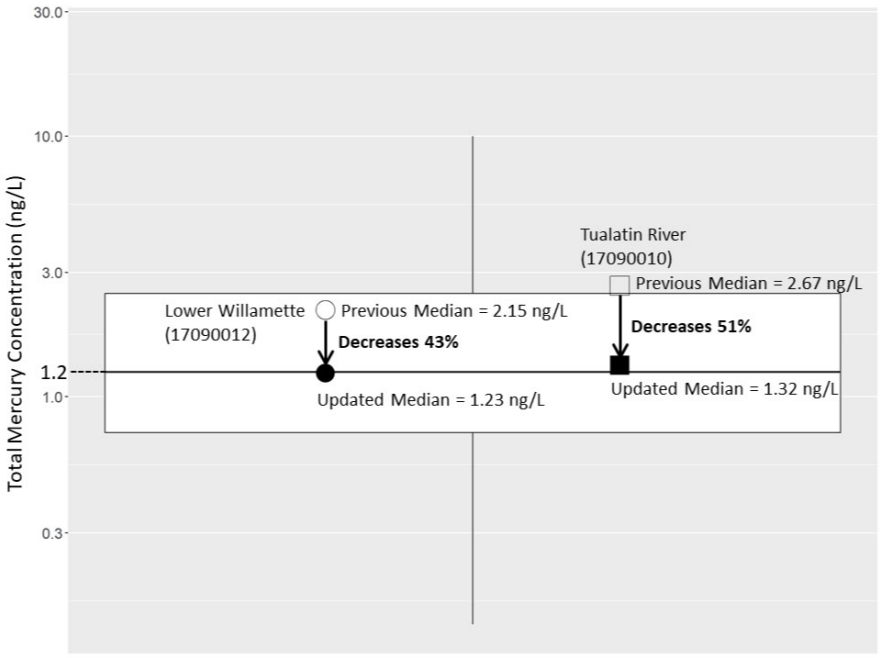

Figure 6. Comparison of the individual total mercury medians of the Lower Willamette and Tualatin HUC08s using data collected in the mainstems between 2012 and 2019 to mercury data to the distribution of the data represented by the boxplot of the data used to calculate the basin-wide existing condition of 1.2 ng/L.

Table 1. General characteristics of recent total mercury data.

HUC08	Data Source	Data Collected By	Number of Sampling Locations	Number of Samples	Time period data covers	New THg Median (ng/L)	Difference between New THg and Basin Median (ng/L) (%)
Lower Willamette	DEQ-AWQMS	City of Portland Bureau of Environmental Services	4	181	Jan-2013 to Dec-2017	1.23	0.03 ng/L 2%
Tualatin	Clean Water Services	Clean Water Services	13	221	Mar-2012 to Oct-2019	1.32	0.12 ng/L 9%

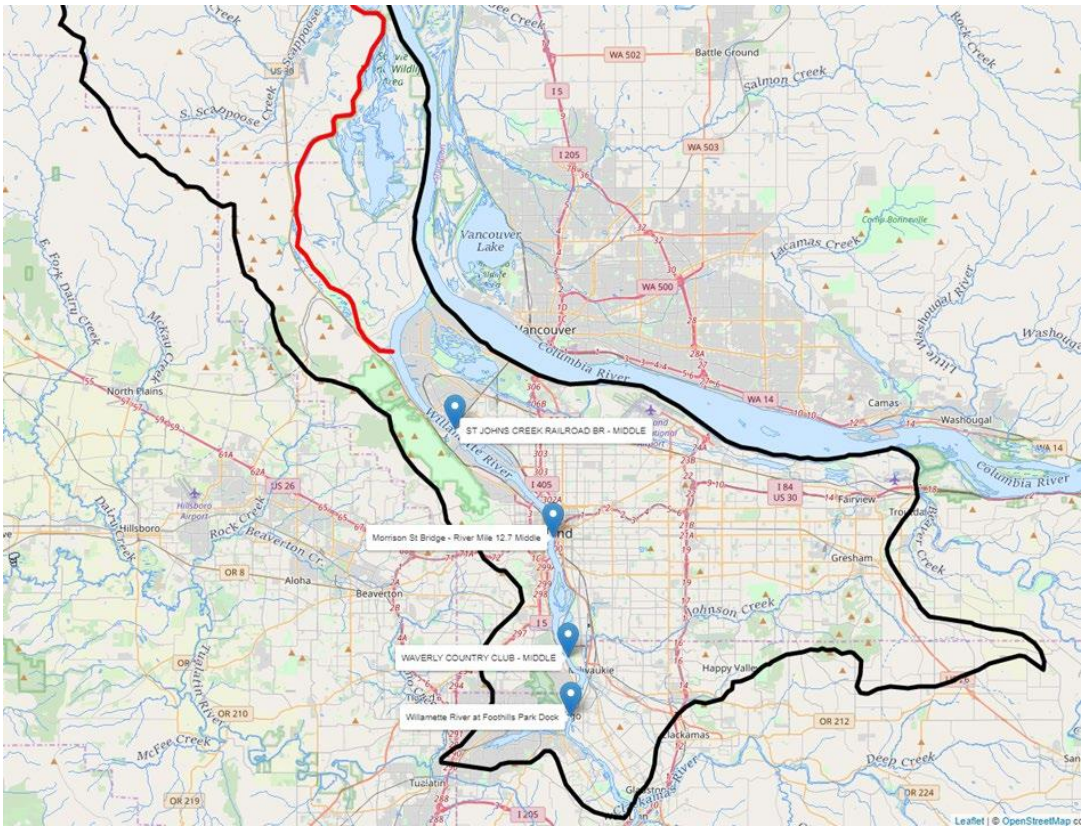

Figure 7. Sampling locations for more recent (2013-2017) Lower Willamette total mercury data. (Note: All locations are near the middle of the main channel of the Willamette River.)

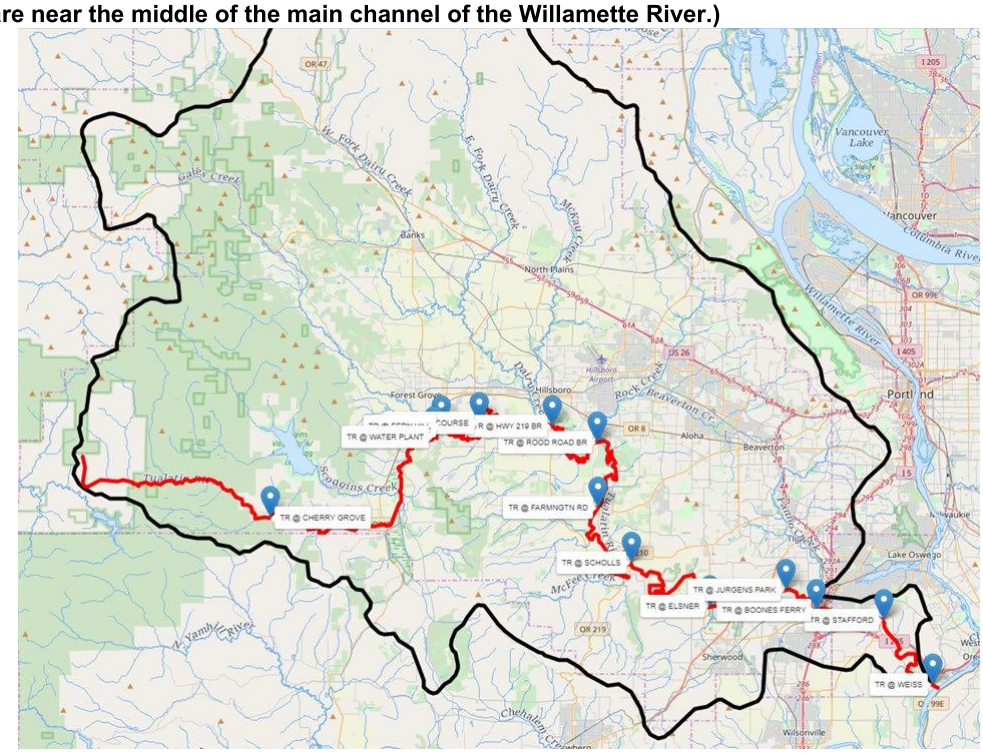

Figure 8. Sampling locations for more recent (2012-2019) Tualatin total mercury data. (Note: All locations are on the Tualatin River.)

Table 2. Comparison of DEQ allocations and EPA proposed allocation approaches.

Source Category	DEQ Basin-wide Reductions	EPA Basin-wide Approach	EPA HUC8-specific Approach
Atmospheric Deposition	11%	91%	91%
General Nonpoint Source (runoff, erosion, groundwater, background)	88%	91%	91%
MS4 & Unpermitted Stormwater	75%	91%	91%
Legacy Mines	95%	97%	97%
Point Source Wastewater	10%	87%	85%
Note: Both EPA approaches calculate higher Coast Fork reductions separately.			

Optimized Allocation by HUC08

Optimized percent reductions for by HUC08. The "solver" tool in Excel is used to find the optimum percent reductions given the lower and upper limit constraints. This sheet uses data from the "Load Capacities" and "At-Source Loads" sheets as input.

See link for more information about Microsoft Solver: Link to Microsoft Excel Solver information

Note: Medians of observed THg data by HUC08 from TMDL used for existing conditions

Load (kg/yr)

	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Total	Check
Total allocation	1.38	0.36	3.59	1.76	1.19	2.10	0.71	1.59	1.77	0.43	1.20	0.16	0.32	0.12	16.69	NA
Load for planned reductions (below)	0.81	0.59	3.45	1.11	0.68	1.11	1.42	1.57	1.31	1.31	0.88	0.57	0.33	0.10	15.25	1.44
		38%								67%		72%				

Planned Percent Reductions

Category	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Opt Reduction	Combined with Atm Dep Reduction	Lower Limit	Upper Limit
Runoff of atmospheric deposition (agriculture)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (forest)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (shrub)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (developed)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (other)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Atmospheric deposition direct to water	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	**11%**		0%	11%
Groundwater (agriculture)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	**60%**		0%	88%
Groundwater (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (developed)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	**22%**		0%	88%
Groundwater (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (agriculture)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (developed)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
MS4	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Urban DMAs	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Mines	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	**95%**		90%	95%
POTWs	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%
Industrial dischargers	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%

Figure 9. DEQ's allocations as in the TMDL using median of observed THg by HUC08 for existing conditions. The Total Allocation (Row 8) is determined from the 0.14 ng/L median THg target and existing condition is represented using median of THg of the observed THg data used in the TMDL by HUC08 (EPA comment). Row 9 is the load calculated for each HUC8 once applying the planned reductions. When comparing the HUC8 specifically for the Coast Fork (17090002), Tualatin (17090010), and the Lower Willamette (17090012), the row 9 values are greater than row 8 by 38%, 67%, and 72% respectively.

Optimized Allocation by HUC08

Optimized percent reductions for by HUC08. The "solver" tool in Excel is used to find the optimum percent reductions given the lower and upper limit constraints. This sheet uses data from the "Load Capacities" and "At-Source Loads" sheets as input.

See link for more information about Microsoft Solver: Link to Microsoft Excel Solver information

Note: Using mean rather than the median for NPM target THg and medians of observed THg data by HUC08 from TMDL used for existing conditions

	Load (kg/yr)															
	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Total	Check
Total allocation	2.27	0.60	5.90	2.89	1.95	3.46	1.17	2.61	2.90	0.71	1.97	0.26	0.53	0.20	27.42	NA
Load for planned reductions (below)	0.81	0.59	3.45	1.11	0.68	1.11	1.42	1.57	1.31	1.31	0.88	0.57	0.33	0.10	15.25	12.17
		Met								45%		54%				

Planned Percent Reductions

Category	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Opt Reduction	Combined with Atm Dep Reduction	Lower Limit	Upper Limit
Runoff of atmospheric deposition (agriculture)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (forest)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (shrub)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (developed)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (other)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Atmospheric deposition direct to water	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	**11%**		0%	11%
Groundwater (agriculture)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	**60%**		0%	88%
Groundwater (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (developed)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	**22%**		0%	88%
Groundwater (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (agriculture)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (developed)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
MS4	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Urban DMAs	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Mines	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	**95%**		90%	95%
POTWs	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%
Industrial dischargers	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%

Figure 10. Potential allocations scenario using Northern Pikeminnow mean (0.23 ng/L). Row 9 is the load calculated for each HUC08 once applying the planned reductions. If the mean THg for the NPM of 0.23 ng/L is used instead of the median (0.14 ng/L). When comparing the HUC8 specifically, the Coast Fork (17090002) load allocation is met; Tualatin (17090010), and the Lower Willamette (17090012), the row 9 values are greater than row 8 by 45% and 54% respectively.

Optimized Allocation by HUC08

Optimized percent reductions for by HUC08. The "solver" tool in Excel is used to find the optimum percent reductions given the lower and upper limit constraints. This sheet uses data from the "Load Capacities" and "At-Source Loads" sheets as input.

See link for more information about Microsoft Solver: Link to Microsoft Excel Solver information

Note: Using mean rather than the median for NPM target THg and more recent THg data used for Tualatin (17090010) and Lower Willamette (17090012) and medians of observed THg data by HUC08 from TMDL used for existing

	Load (kg/yr)															
	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Total	Check
Total allocation	2.27	0.60	5.90	2.89	1.95	3.46	1.17	2.61	2.90	1.44	1.97	0.46	0.53	0.20	28.35	NA
Load for planned reductions (below)	0.81	0.59	3.45	1.11	0.68	1.11	1.42	1.57	1.31	1.31	0.88	0.57	0.33	0.10	15.25	13.10
		Met								Met		20%				

Planned Percent Reductions

Category	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Opt Reduction	Combined with Atm Dep Reduction	Lower Limit	Upper Limit
Runoff of atmospheric deposition (agriculture)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (forest)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (shrub)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (developed)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Runoff of atmospheric deposition (other)	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	99%	**88%**	99%	0%	88%
Atmospheric deposition direct to water	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	**11%**		0%	11%
Groundwater (agriculture)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	**60%**		0%	88%
Groundwater (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Groundwater (developed)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	**22%**		0%	88%
Groundwater (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (agriculture)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (developed)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
Sediment (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
MS4	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Urban DMAs	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
Mines	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	**95%**		90%	95%
POTWs	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%
Industrial dischargers	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%

Figure 11. Potential allocations scenario using Northern Pikeminnow mean (0.23 ng/L) and more recent data on existing condition in the Tualatin and Lower Willamette. Row 9 is the load calculated for each HUC08 once applying the planned reductions. If the mean THg for the NPM of 0.23 ng/L is used instead of the median (0.14 ng/L). If use more recent THg data for the Tualatin and Lower Willamette to calculate the median THg for existing conditions. When comparing the HUC08 specifically, the Coast Fork (17090002) load allocation is met; Tualatin (17090010) is met; Lower Willamette (17090012) the row 9 values are greater than row 8 by 20%.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	**Optimized Allocation by HUC08**																		
2	*Optimized percent reductions for by HUC08. The "solver" tool in Excel is used to find the optimum percent reductions given the lower and upper limit constraints. This sheet uses data from the "Load Capacities" and "At-Source Loads" sheets as input.*																		
3	*See link for more information about Microsoft Solver:* Link to Microsoft Excel Solver information																		
4																			
5	Note: Increase atm reduction to 70% and using mean rather than the median for NPM target THg and more recent THg data used for Tualatin (17090010) and Lower Willamette (17090012) and medians of observed THg data by H																		
6		Load (kg/yr)																	
7		17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Total	Check		
8	Total allocation	2.27	0.60	5.90	2.89	1.95	3.46	1.17	2.61	2.90	1.44	1.97	0.46	0.53	0.20	28.35	NA		
9	Load for planned reductions (below)	0.63	0.50	3.14	0.98	0.59	0.99	1.06	1.52	1.25	1.24	0.81	0.46	0.31	0.08	13.55	14.80		
10			Met								Met		Met						
11																			
12		Planned Percent Reductions																	
13	Category	17090001	17090002	17090003	17090004	17090005	17090006	17090007	17090008	17090009	17090010	17090011	17090012	Multnomah	Columbia	Opt Reduction	Combined with Atm Dep Reduction	Lower Limit	Upper Limit
14	Runoff of atmospheric deposition (agriculture)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**88%**	100%	0%	88%
15	Runoff of atmospheric deposition (forest)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**88%**	100%	0%	88%
16	Runoff of atmospheric deposition (shrub)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**88%**	100%	0%	88%
17	Runoff of atmospheric deposition (developed)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**88%**	100%	0%	88%
18	Runoff of atmospheric deposition (other)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	**88%**	100%	0%	88%
19	Atmospheric deposition direct to water	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	**70%**		0%	11%
20	Groundwater (agriculture)	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%	**60%**		0%	88%
21	Groundwater (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
22	Groundwater (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
23	Groundwater (developed)	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	22%	**22%**		0%	88%
24	Groundwater (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
25	Sediment (agriculture)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
26	Sediment (forest)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
27	Sediment (shrub)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
28	Sediment (developed)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
29	Sediment (other)	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%	**88%**		0%	88%
30	MS4	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
31	Urban DMAs	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	**75%**		0%	75%
32	Mines	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	**95%**		90%	95%
33	POTWs	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%
34	Industrial dischargers	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	**10%**		0%	10%

Figure 12. Potential allocations scenario using Northern Pikeminnow mean (0.23 ng/L), more recent data on existing condition in the Tualatin and Lower Willamette and increased atmospheric deposition reductions. Row 9 is the load calculated for each HUC08 once applying the planned reductions. If the mean THg for the NPM of 0.23 ng/L is used instead of the median (0.14 ng/L). If use more recent THg data for the Tualatin and Lower Willamette to calculate the median THg for existing conditions. Increase reduction in atmospheric deposition to 70%. When comparing the HUC8 specifically, all subbasin load allocations are met.

C_J#10: Suggested Change ID #61

Description: Critical Condition - Expand critical condition discussion

Comment: Section 8, page 46. We recommend that discussion of critical conditions be expanded to address other factors which could be critical to loading and accumulation of mercury in fish tissue. For example, to the extent it is known, how have critical factors or conditions which relate to the conversion of inorganic mercury to methyl mercury been accounted for? Are higher loads which might occur in the winter/spring a significant factor contributing to exceedances of the fish tissue criteria, which should be accounted for in the analysis?

Response: In OAR 340-042, critical conditions could include: stream flow, sensitive beneficial uses, pollutant loading and water quality parameters so that water quality standards will be attained and maintained during all seasons of the year. Bioaccumulation of mercury in fish is a long-term process related to the intake of prey containing methylmercury and, to a lesser extent, methylmercury concentrations in the water. It takes several years for fish to accumulate enough methylmercury to exceed the fish-tissue criterion, resulting in the issuance of fish consumption advisories. Low stream flow times for assigning allocations would not be appropriate for long term bioaccumlation that occurs throughout the year. However, other critical conditions are addressed in this TMDL, such as sensitive beneficial uses, pollutant loading during precipitation and runoff events, and factors affecting methylation of mercury.

C_J#11: Suggested Change ID #62

Description: Source Assessment - Air emissions - National and Global

Comment: Section 9.1.2, page 47 The fifth sentence in the first paragraph in this section states "The assessment asserts that legacy mining mercury sources up until the end of the 19th century continue to contribute more mercury to soils and waters than all 20th century industrial sources combined and that the potential for its remobilization complicates analysis of fate and transport (United Nations Environment Programme, 2019)."

It is unclear which soils are being referred to here. Is this referring to soils specifically located near abandoned mines or is this the global soil pool? These statements can help add relevant information to the WRB, however, it must be clear how it applies to the WRB.

Response: The title of Section 9.1.2 is "National and global mercury emissions trends" and the information provided in the section is relevant to the global and national scale, rather than the Willamette River Basin. The information is provided for context to support the closing paragraph statements of these global and national sources being the major contributors in the basin and also largely outside of Oregon's control. DEQ inserted "United Nations assessment" to further clarify that soil sources discussed were global and not local to the Willamette Basin and also clarified the origination of most sources being outside of Oregon in the closing paragraph.

C_J#12: Suggested Change ID #63

Description: Source Assessment - Local air emissions. Give "within-Basin" air sources a specific allocation for their emissions

Comment: The TMDL indicates that 145 facilities in the WRB have reported atmospheric emissions of mercury. It goes on to indicate that these reported air emissions are being tracked, and controls of significant emissions are being required under recently adopted Cleaner Air Oregon rules (p. 47). More specifically:

"DEQ tracks these reported permitted air emissions and is requiring controls for significant emissions under recently adopted Cleaner Air Oregon rules. However, air deposition modeling was not undertaken for the TMDL, so loads deposited due to these air emissions have not been quantified and are not assigned a specific allocation in the TMDL."

EPA strongly supports Oregon's new air regulations and controls on these mercury emissions. The TMDL relies in part on controlling atmospheric sources as part of the basis for Reasonable Assurance, although recognizing the larger impact from international sources.

We recognize that modeling of these air emissions and their deposition was not undertaken as part of this TMDL. However, it is conceivable that at least particulate fractions of these emissions could deposit locally. To better link the objectives of the TMDL with the control mechanisms available within the Oregon air regulatory program, we recommend that these "within-Basin" sources receive a specific allocation for their emissions within the overall LA for Atmospheric Deposition in the TMDL, consistent with the statement regarding reductions of local emissions in the reasonable assurance section. Section

14.1.1 page 132. “Key reduction strategies include: control of all air emissions sources greater than 1 kg/year of mercury within Oregon.”

Since these are known mercury sources, and their control is relied upon in the reasonable assurance demonstration, ODEQ should consider including a specific allocation for them within the atmospheric deposition category.

Response: DEQ did not include a specific allocation within the atmospheric deposition category for the three facilities located within the Willamette Basin with reported mercury emissions greater than 1 kg/yr. The primary reason is that DEQ does not have current analytical tools to determine loads of mercury that could be deposited from these facilities and then carried to waterways, and therefore cannot set wasteload allocation reductions for these facilities. This lack of quantification does not, however, preclude targeting mercury emissions reductions from these facilities as a key strategy to be relied on for reasonable assurance in achieving the atmospheric deposition load allocation, especially given the significant emissions reductions demonstrated at facilities outside the Willamette Basin, noted in the Reasonable Assurance section of the TMDL. There are also other important considerations in not setting these facility-specific allocations. First, DEQ did not set facility-specific allocations for any other point or nonpoint sources. Rather DEQ set aggregate allocations, as allowed for in the Clean Water Act and documented in 40 CFR 130.2(I). It would, therefore, be inequitable to single out these facilities for individual allocations and not defensible given the level of information available on potential significance of mercury loads reaching waterways following emission from these facilities. In addition, the atmospheric deposition category is a nonpoint source sector with an aggregated load allocation. Assigning individual point source wasteload allocations within this nonpoint source load allocation sector would be needlessly complicated.

C_J#13: Suggested Change ID #64

Description: Source Assessment - Legacy Metals Mining. Include more information on mercury load entering Cottage Grove Reservoir

Comment: Section 9.2.3 page 52. The last two sentences in the last paragraph on this page state that “An example of this relationship is shown in Figure 9-3. The mercury load leaving Cottage Grove Reservoir was estimated by the modeling to be approximately 2.45 kg/yr (TetraTech, 2019).” Without a discussion of the Hg load entering the reservoir, it is hard to understand what the exported load represents. Presumably this is a smaller load than from the inflow. If available, more information regarding the load entering the reservoir should be presented.

Response: DEQ acknowledges that mercury loads flowing into and out of reservoirs are complicated by processes occurring within the reservoirs. The information presented in Section 9.2.3 is drawn from the TMDL Technical Support Document (as referenced) and intended to highlight the higher concentrations of mercury found in reservoirs to which tributaries impacted by legacy mining areas flow. Additional information on estimates of mercury in inflows, where available, is provided in the TMDL Technical Support Document, referenced in the TMDL.

C_J#14: Suggested Change ID #65

Description: Source Assessment NPS - Background and unquantified anthropogenic sources - define "natural" source of Hg

Comment: Summary of suggested change: Define what is considered a "natural" source of Hg Section 9.3 page 52. The fourth sentence in the first paragraph in this section states that "Also, the mercury attached to eroded soil that is delivered as sediment to the streams and rivers is from natural and anthropogenic sources. However, not all the surface runoff or the eroded soil are background sources and human activities do elevate the rates of these processes"

"Background" is clearly defined in the beginning of this section, but "natural" is not. It is not clear if these are considered the same or different, but based on the definition of "background", which includes Hg from the global pool of anthropogenic released Hg, we suggest defining what is considered a "natural" source. Presumably, this is Hg of geologic origin.

Additionally, because atmospheric deposition is such a large driver of Hg sources in this TMDL, it may be worth underscoring the point that the majority of the Hg in soil is estimated to be of anthropogenic origin that has accumulated from previous deposition from the atmosphere. See the reference below for more information related to this issue.

Amos et al, Legacy impacts of all-time anthropogenic emissions on the global mercury cycle. BIOGEOCHEMICAL CYCLES, VOL. 27, 410–421, doi:10.1002/gbc.20040, 2013

Response: DEQ is using definitions in OAR (OAR 340-042-0030(1)).

C_J#15: Suggested Change ID #66

Description: Reserve Capacity - require further reductions for reserve capacity

Comment: Table 10-1, page 62. "Reserve Capacity is not allocated as a percent reduction, rather an additional 1 percent reduction is required from atmospheric deposition, which will be used for any needed reserve capacity."

Allocating a reserve capacity for future sources is valuable but creating a reserve by expecting further reductions in atmospheric deposition may not be supportable. It is stated in the TMDL that atmospheric deposition is largely out of the States control, because a large majority of the loading originates in the global atmospheric pool. Since the watershed currently exceeds the mercury target set in the TMDL, it may be more justifiable to call for further reductions from sources within the Basin which are controllable.

Response: 'DEQ agrees and has made this change on page 65, Section 10.2: in the last paragraph change "10 percent" to "11 percent" for reduction in local atmospheric sources: The 11 percent reduction for atmospheric sources is anticipated to occur through controls on local emissions within Oregon, but to greater extent through on-going reductions being achieved nationally (United Nations Environment Programme, 2019) and in the future through enactment and implementation of international treaties.'

C_J#16: Suggested Change ID #67

Description: WLA - define "measurable mercury" and describe compliance and monitoring requirements

Comment: Section 10.2. The first sentence in the first complete paragraph on page 67 states that "For wastewater discharges, DEQ will require development and implementation of mercury minimization programs at facilities with measurable mercury, significant flows and activities that increase the potential for mercury in discharge, in order to achieve facility-specific portions of the aggregate 10 percent overall sector reduction. The facility-specific portions will reflect both current minimization programs and the potential for reductions from current conditions."

It is not clear how "measurable mercury" is defined in this statement and the mechanism by which monitoring for it will be required and tracked for compliance. It would be helpful to summarize the monitoring requirements for point sources and their timing, so it will be evident when and how progress towards achieving the 10% and 75% reduction from WWTPs and stormwater will be evaluated.

Response: DEQ changed "measurable" to "measured" to clarify that detection of mercury in effluent is a necessary requirement, along with flow volumes, for determining a facility's mercury discharge loads and their significance, as well as targeting mercury minimization measures. DEQ notes that the method detection limit for the EPA approved mercury analytical method for NPDES is 0.5 ng/L, which limits analysis and action on mercury at levels below the detection limit. Sections 13.3.2.1 and 13.3.2.2 provide DEQ's approach for implementing monitoring requirements for both wastewater and stormwater permits. DEQ notes that levels currently achievable will vary by wastewater facility and this will inform application of targeted minimization measures at each facility.

C_J#17: Suggested Change ID #68

Description: TSS Surrogate - valuable to have a less expensive surrogate

Comment: Section 10.3 pages 69, 70, 132. ODEQ is proposing to use total suspended solids (TSS) as a surrogate for mercury (p. 68, Section 10.3). EPA appreciates that monitoring for mercury can be expensive and that it can be valuable to have a less expensive surrogate(s) to help track implementation of the mercury TMDL, if the surrogate is reasonably related to mercury levels.

We have concerns regarding the statistical methodology ODEQ used to establish the TSS surrogate in this TMDL (Appendix H), based on review comments provided by Tetra Tech (Tetra Tech, 2019). We suggest responding to the suggestions raised by Tetra Tech, including exploring alternative statistical approaches, and exploring the use of alternative surrogates. We would be glad to discuss options with you, if needed.
Additional technical comments regarding the surrogate include the following:

Regarding: "TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009)" Comment: Eckley and Branfireun 2009 identified a relatively strong correlation between TSS and Hg in urban catchments but did not measure organic pollutants and also did not use TSS as a surrogate for Hg. Suggest removing this reference for this statement. A few lines down, the reference to this paper is more accurate.

Regarding: "A strong relationship was found between TSS and THg for this data" Comment: Would be useful to provide the R2 and p-value at the end of this sentence.

Comment: Given that the use of TSS as a surrogate for mercury is reliant on the assumption that mercury is largely associated with sediment particles in the Willamette basin, it would be valuable to summarize available data on the proportion of mercury which is in the dissolved phase vs. the particulate phase. This could help inform the utility of using TSS as a surrogate measure.

Response: DEQ appreciates this comment in support of using TSS as a surrogate for evaluating the effectiveness of TMDL implementation in achieving total mercury reductions. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

C_J#18: Suggested Change ID #69

Description: TSS Surrogate - clarify role of surrogate

Comment: The role of the TSS surrogate is also somewhat unclear. The TMDL indicates it will be used to track implementation, but it's not clear whether it would be appropriate to do so for all source types, or just certain types, such as agriculture, forestry, etc. For example, it's not clear whether it would be a valuable tool to use to track point source implementation. More detailed discussion of its appropriate use, and more broadly how TSS monitoring would relate to monitoring of TMDL targets for mercury in water and fish tissue, would be helpful.

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6. DEQ anticipates that implementation of allocations and surrogates to reduce high levels of solids and total mercury in the water column during high flows events will reduce the amount of mercury available for methylation. This in turn, will reduce the amount of methylmercury in the water and bioavailability for uptake into fish. Therefore, implementation of the allocations and surrogates will reduce high levels of solids in the water column and reduce the amount of total mercury in the aquatic system; which will reduce the amount of total mercury available for methylation to methylmercury; and lower levels of methylmercury in the water column, there will lead to less methylmercury bioaccumulated into fish tissue; and eventually lower fish tissue methylmercury concentrations.

C_J#19: Suggested Change ID #70

Description: Reserve Capacity - include the procedure to allocate, document and distribution of the reserve capacity

Comment: page 72: The third sentence in the paragraph in this section states that "Prior to allocating a portion of the reserve capacity to a new or expanded nonpoint source, DEQ will require implementation

of DEQ approved mercury minimization measures with data collection appropriate for achieving measurable objectives, as described in the Water Quality Management Plan for the appropriate sector."

Please include in the WQMP or as an appendix to the TMDL, the procedure to allocate, document and track distribution of the reserve capacity over time. This will ensure clarity and that the reserve isn't over allocated.

Response: DEQ determined that all nonpoint sources of mercury had been accounted for during the land use evaluation and subsequent analyses in developing the TMDL. While there may be some changes in ownership or use of some nonpoint source lands, DEQ does not anticipate identification of any additional new nonpoint sources of mercury. Therefore, DEQ removed the statement about requirements for allocating reserve capacity for new or expanded nonpoint sources.

C_J#20: Suggested Change ID #71

Description: WQMP - encourage opportunities for land management agencies to reduce MeHg production

Comment: Section 13, page 73. Currently, the WQMP makes little or no mention of MeHg production and is focused on THg loading, mostly based on erosion control. If a land management agency can identify opportunities to reduce MeHg production, it should be encouraged to do so as it would help meet the end objective of reducing MeHg in fish.

Response: DEQ agrees that if land managers can identify opportunities to reduce methyl mercury production, they should do so. The WQMP focuses on erosion and runoff control because management practices to reduce sediment are generally well known, whereas conditions that methylate mercury is still an evolving science.

C_J#21: Suggested Change ID #72

Description: WQMP - Potential delay in renewing NPDES permits and control measures/monitoring requirements

Comment: Section 13.1.1 page 74. The second full paragraph on this page states "For point sources, wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions."

Because there are a substantial number of NPDES permits covered in this TMDL, and because there exists a large backlog of NPDES permits needing to be renewed, does this mean that monitoring and implementation measures will only happen after the NPDES permit is renewed? If so, it seems there will be a substantial lag time before some NPDES permittees are required to monitor and implement mercury control measures. If there is a delay in issuing renewed NPDES permits and thus a delay in monitoring

and implementing mercury control measures, how will DEQ evaluate the overall effectiveness of implementing the TMDL? Should DEQ initiate monitoring requirements sooner?

Response: DEQ clarifies that, while the aggregated wastewater sector wasteload allocation applies to a substantial number of permits, requirements for implementation of mercury minimization measures and on-going monitoring only apply to the 23 major municipal sewage treatment plants listed in Table 9-3 and a subset of the 23 major and minor industrial facilities listed in Table 9-4. While there is a backlog of expired NPDES permits throughout Oregon, DEQ retooled the program in 2017 and has made progress on reducing the backlog. The Willamette Basin permits awaiting renewal will be included in DEQ's short-term (annual) and long-term (5-year) NPDES individual permit issuance plans available at https://www.oregon.gov/deq/Permits/Pages/default.aspx. Despite status in the queue for renewal, however, most of the major municipal sewage treatment plants have already developed mercury minimization measures, with many implementing them for decades. In addition, most major municipal sewage treatment plants and many industrial facilities are already required to monitor for mercury. This information will allow DEQ, upon permit renewal, to approve enhanced minimization plans to better target reductions. Because the sector-wide 10% reduction amounts to 0.44 g/day (or 0.16 kg/year) for the entire basin, DEQ anticipates achieving the aggregate reduction through implementation of minimization measures at facilities with nascent or least mature plans and cessation of suction dredge mining in the tributaries to Dorena Reservoir. For permitted facilities not currently monitoring for mercury and which are 5 or more years away from renewal, DEQ will consider requiring mercury monitoring prior to renewal.

C_J#22: Suggested Change ID #73

Description: WQMP - ensure rule or plan changes to meet mercury TMDL goals for the Ag sector

Comment: Section 13.3.1.4 page 82. The first paragraph in this section states "Implementation of the recommendations provided in area plans is voluntary, however ORS…stipulates that ODA must also adopt rules that protect water quality in areas designated as exclusive farm use and other agricultural lands."

Ag WQMP Rules are very general and are rarely revised. How will DEQ and ODA ensure that rule changes, such as those needed to implement broader riparian buffers, or plan changes that incorporate implementation actions to meet the mercury TMDL goals for the Ag Sector, get included in the plans and rules?

Response: DEQ acknowledges that there remains a need for improved riparian conditions on agricultural lands. In order to better characterize effective shade status in riparian areas on agricultural lands, DEQ recently performed an effective shade analysis for part of the Willamette Basin. The results of this analysis will be included in the 2019 Upper Willamette Water Quality Status and Trends Report. While the results of this analysis will primarily be used to help focus implementation in areas where riparian conditions are not meeting effective shade targets of the Willamette Basin Temperature TMDL, they may also be an indication of riparian conditions that are not able to provide for other functions, such as filtering pollutants and stabilizing stream banks, which is important for implementing the Mercury TMDL. ODA is expected to use the results of this analysis to help focus implementation and technical assistance for the purpose of protecting and enhancing riparian conditions.

If DEQ determines that agricultural practices subject to the Agricultural Water Quality Management Act are not making satisfactory progress meeting milestones or achieving load allocations, or if the area plan

and rules are not adequate to implement the load allocation, the department will provide ODA with comments on what would be sufficient to meet TMDL load allocations during each biennial review process and request the Environmental Quality Commission to petition ODA to make the necessary changes (OAR 340-042-0080(3)).

C_J#23: Suggested Change ID #74

Description: MOS - Agricultural sector. Supporting data needed

Comment: Section 13.3.1.4 page 83. Data/information should be presented to support the position that bare ground during wet winter months is the most important transport mechanism from agricultural lands. Also, roads in an agricultural setting (or forestry) may not be the best focal point for addressing mercury control. While roads are a known source of sediment, in the context of the overall landscape, roads likely represent a relatively small surface area, and therefore may not be a large source of atmospherically deposited Hg. It seems that establishing adequate riparian protections in agricultural lands would also be a critical strategy worth emphasizing to reduce mercury movement to waterbodies, minimize erosion, reduce water temperatures and protect streambank stability.

Response: Oregon Department of Agriculture's commitment to focusing on bare ground is based on the best professional judgement of on-the-ground staff that have identified bare ground as a recurring issue they see when they are in the field. Mike Powers (personal communication, 4/10/2019) indicated that ODA does not have data to support this assertion. DEQ agrees that agricultural road networks represent a relatively small footprint in the watershed, but DEQ does not have data about the impact of agricultural roads. And, hydrologically connected roads can be a source of sediment to waterbodies. Inventorying or collecting information on the impact of agricultural roads can help determine whether ODA should focus implementation efforts on other agricultural sources of sediment in the future.

DEQ acknowledges that there remains a need for improved riparian conditions on some agricultural lands. In order to better characterize effective shade status in riparian areas on agricultural lands, DEQ recently performed an effective shade analysis for part of the Willamette Basin. The results of this analysis will be included in the 2019 Upper Willamette Water Quality Status and Trends Report. While the results of this analysis will primarily be used to help focus implementation in areas where riparian conditions are not meeting effective shade targets of the Willamette Basin Temperature TMDL, they may also be an indication of riparian conditions that are not able to provide for other functions, such as filtering pollutants and stabilizing stream banks, which is important for implementing the Mercury TMDL. ODA is expected to use the results of this analysis to help focus implementation and technical assistance for the purpose of protecting and enhancing riparian conditions. In addition, DEQ believes keeping soil on the land instead is an important step in controlling soil movement to waterbodies.

C_J#24: Suggested Change ID #75

Description: MOS - ODF. Topics in Table 13-5 do not appear to be management strategies or pollutant sources

Comment: Section 13.3.1.5 page 87. Some of topics in the Table 13-5 do not appear to be "pollutant sources" or "management strategies to address sediment and mercury".

Please provide information that explains how the "Notification system (FERNS)" and how the "Member of Water Quality Pesticide Management Team, Pesticide Stewardship Partnerships" are related to Hg mobilization.

Response: Table 13-5 in the section related to the Oregon Department of Forestry lists a number of forestry management practices and programs employed to reduce erosion (and presumably any mercury attached to sediment). The TMDL implementation plan that ODF develops will contain additional detail about these practices and programs.

C_J#25: Suggested Change ID #76

Description: MOS - DSL - clarifications needed

Comment: Section 13.3.1.6 page 89. The sentence in the first paragraph under this heading states "DSL will continue…practices that reduce runoff, sediment and erosion."

While reducing runoff and erosion are important, it is not clear what is being conveyed in stating the need to reduce sediment. Are your intentions to say limit "sediment movement" in this statement? If so, it is suggested to add the word "movement" after "sediment" in the sentence. If not, please explain what is intended to be conveyed here.

Response: DEQ agrees that the intention of implementation as it relates to activities on DSL managed lands is to reduce sediment movement. The language in this section of the WQMP was updated to reflect this.

C_J#26: Suggested Change ID #77

Description: WQMP - State Lands - emphasize restoring/maintaining intact riparian areas

Comment: Table 13-7 page 89. The third item in Table 13-7 states "Encourage persons authorized to use state-owned land for grazing to prevent their animals from walking in or drinking directly from streams on state-owned property."
While EPA agrees with this statement, it might be more important for mercury control to emphasize restoring/maintaining intact riparian areas which could act as filters for movement of mercury into streams.

Response: The referenced language appears in Table 13-6 on page 89 of the draft WQMP. DEQ agrees that riparian buffers play an important role in filtering pollutants such as mercury and sediment, as well as reducing erosion and sediment movement through increased streambank stability. DSL does not have any rangeland class or agricultural class properties in the Willamette Basin. The TMDL WQMP was revised to reflect this.

C_J#27: Suggested Change ID #78

Description: WQMP - OPRD - apply buffers to non-fish bearing streams

Comment: Table 13-7. Pages 90 and 91. The second item in Table 13-7 states "Continue to require permittees with Agricultural Leases to apply best management practices to prevent and reduce runoff and erosion, including retaining 50 foot no-till buffers along fish-bearing streams, and maintaining ground cover during wet, winter months."

While EPA partially agrees with the statement (the proposed riparian buffer of 50 feet may not be adequate) this action should be applied to non-fish bearing streams as well. Non-fish bearing streams can be important conduits for mercury transport into the larger basin streams where fish reside.

Response: Oregon Parks and Recreation Department performs site evaluations for every agricultural lease application. GIS tools are used to delineate the riparian buffers established for all fish-bearing streams; the minimum buffer required is 50 ft. for fish-bearing streams. Agricultural buffers of 100 ft. are applied on the Willamette River. No farming activities are allowed within the riparian buffer area. While OPRD does not enforce a minimum riparian buffer on non-fish bearing streams, there are currently no guidelines in place that would restrict buffers on these streams if OPRD determines they are necessary for the protection of water quality or the environment. OPRD also has the authority to require buffers on landscape features which include but are not limited to surface bodies of water. DEQ will work with OPRD, as well as other DMAs, for evaluating implementation results.

C_J#28: Suggested Change ID #79

Description: WQMP - Stormwater management non-permitted urban DMAs

Comment: Section 13.3.1.11.2. Page 98. The third bullet in this paragraph states "Requiring or encouraging the use of low impact development to reduce the volume and rate of stormwater discharged to streams".

While EPA agrees that stormwater discharge should be reduced, it may be worth including a sentence indicating that these systems should also be designed to minimize MeHg production and, if possible, monitored for MeHg export.

Response: Although DEQ agrees that there is a possibility that some low impact development may provide conditions for methylation of mercury, it is not our intention for cities to monitor for methyl mercury export from these facilities at this time. However, DMAs may choose to conduct mercury monitoring of low impact development facilities, such as detention ponds, where stormwater monitoring indicates it is a potential source of methylation. DEQ is initially focusing its attention on potentially greater sources of methylation, such as may occur in large reservoirs across the Willamette Basin.

C_J#29: Suggested Change ID #80

Description: WQMP - OPRD - be aware that stormwater retention ponds could potentially produce MeHg

Comment: Table 13-7 page 91. The fifth management strategy identified in Table 13-7 states "Use on-site stormwater retention in new park designs to infiltrate stormwater".

Stormwater retention ponds are a form of impoundment that have the potential to increase MeHg production. While they may be effective in reducing the THg load to the river, they also have the potential to create stagnant water and MeHg production. On balance, and depending on the specific design, there may be net benefit to stormwater detention ponds, but we should be aware of the potential MeHg production.

Response: DEQ acknowledges EPA's comment.

C_J#30: Suggested Change ID #81

Description: WQMP - Stormwater management non-permitted urban DMAs. Clarify impact of fuel efficient vehicles on mercury reduction

Comment: Section 13.3.1.11.2 page 98. The fourth bullet under this heading states "Reducing emissions by purchasing more fuel-efficient vehicles for municipal fleets".

While this is generally a good practice, it is not clear how this relates to Hg inputs to the WRB. Is the assumption that there is Hg in fuel being burned? In general, the Hg content in gas is low. Please explain the value of this action in minimizing mercury emissions.

Response: Although mercury emissions from gas and diesel powered engines may be low and not a significant source of mercury, DEQ will encourage DMA efforts to reduce potential sources of mercury to the Willamette Basin where significant reductions are needed to meet the state's water quality standards for mercury. DMA implementation plans will include additional management practices to reduce sediment and mercury.

C_J#31: Suggested Change ID #82

Description: WQMP - Stormwater management - define timeline for communities with less than 5000 population

Comment: Section 13.3.1.11.2 page 99. Deadline for Fully Implementing Stormwater Control Measures – The third bullet under this title indicates that communities with a population under 5000 have no deadline for fully implementing stormwater control measures. It seems that a better approach would be to define the timeline for implementing, i.e., 10 years but offer extensions when necessary. Having a deadline would more likely promote implementation than not having an implementation deadline. Suggest including implementation deadlines with provisions to allow for extensions when needed.

Response: Cities and counties with a population less than 5,000 people are not required to implement the six stormwater control measures. Consequently, there are no deadlines specified in the WQMP. However, these cities and counties must evaluate the six stormwater control measures and identify the strategies and actions that they can implement to reduce mercury and sediment. DEQ basin coordinators will work closely with these small DMAs to track how they are evaluating stormwater control measures and meeting interim milestones in accomplishing these goals. For example, cities and counties may already be implementing pollution prevention activities, but are seeking funds to establish an illicit discharge and elimination system program within the next eight years. This goal could be included in the TMDL

implementation plan and then DMAs would report on the status of meeting these milestones in the annual report to DEQ.

C_J#32: Suggested Change ID #83

Description: WQMP - BLM - Clarify BLM's Plan was recently revised

Comment: Section 13.3.1.12 page 100. The second paragraph in this section identifies BLM's Resource Management Plan as the plan BLM follows for guiding its work. EPA recommends mentioning that the Resource Management Plan was recently revised and adopted (and supported by both DEQ and EPA) to appropriately document that it is a "current" work plan.

Response: The following sentence was added to section 13.3.1.12: "The Resource Management Plans for western Oregon, which include the Willamette Basin, were recently updated in 2015."

C_J#33: Suggested Change ID #84

Description: WQMP - Water conveyance entities - water quality monitoring

Comment: Table 13-17 and 13-18 page 109, 110. Neither Table 13-17 or Table 13-18 identify water quality monitoring as a measure for the water conveyance entities.

Water quality monitoring is essential for determining water quality trends relative to BMP implementation. EPA recommends that the tables specifically identify the need and commitment to collect data on sediment and mercury levels discharged from these operations along with other water quality parameters.

Response: DEQ agrees that monitoring sediment and mercury is critical for determining water quality trends relative to BMP implementation. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

C_J#34: Suggested Change ID #85

Description: WQMP - Reservoir Management - modify listed BMP description

Comment: Section 13.3.1.22 page 112. The third BMP in Table 13-19 states "In-reservoir sediment removal or encapsulation".

EPA suggests modifying the listed BMP to: “In-reservoir sediment removal or encapsulation only in areas where the historic sediment in the reservoir has significantly higher mercury concentrations than contemporary sediment deposition”.

Response: DEQ has added this clarification to the table.

C_J#35: Suggested Change ID #86

Description: WQMP - MS4 Phase II - require paired TSS/Hg samples

Comment: Section 13.3.2.2.1 page 117. No paired TSS/Hg monitoring is required of Phase II MS4 facilities. To provide valuable data on the success of the Phase II MS4s’ mercury control programs over time, EPA strongly recommends that paired TSS/Hg samples be collected as is required of Phase I facilities.

Response: DEQ’s general permit for Phase II MS4s became effective March 1, 2019 and includes conditions requiring erosion control, which are anticipated to reduce mercury discharges associated with the primary air deposition and soil sources of mercury in the Willamette Basin. As noted in the TMDL, DEQ intends to evaluate information required to be reported by Phase I and II MS4 permittees during the first permit cycles following issuance of the TMDL, in keeping with the Accountability Framework, to determine whether additional permit requirements may be needed to achieve the aggregated wasteload allocation for permitted stormwater discharges. DEQ expanded the text in Section 13.3.2.2.1 to include consideration of paired TSS and mercury samples from Phase II permittees as a specific example of potential requirements.

C_J#36: Suggested Change ID #87

Description: Monitoring Strategy - Have strategy available for final TMDL

Comment: The second paragraph in this section states: “Tracking of water quality status and trends will include DEQ tracking and reporting on: • TMDL implementation plan submittals, reviews, and approvals • DMA, responsible person and permittee implementation of management actions • Instream compliance points for allocations, in conjunction with revisiting the watershed modeling • Annual and other increment reporting from DMAs, responsible persons and permittees • Five-year reviews of implementation and evaluation of the TMDL and WQMP”

The Monitoring Strategy is a key component relied upon for adaptive management and reasonable assurance. Consequently, we feel it is important to have a draft of the Monitoring Strategy available for the final TMDL to complete the documentation for these TMDL components. We recommend explaining the major elements and commitments of the Strategy, and how they will be used in the future to assess status and trends in key monitoring elements.

Response: DEQ agrees that having a draft standalone Monitoring and Assessment Strategy is important. DEQ included a high-level description of the major elements and commitments of the Monitoring and Assessment Strategy in the TMDL.

C_J#37: Suggested Change ID #120

Description: Allocations - Table 10-1 - source sector clarifications needed

Comment: Allocation Table (Section 10, Table 10-1, p62)

Please clarify information in Table 10-1, particularly regarding source sectors and associated allocations. Some sectors are repeated with conflicting allocations, making it difficult to understand how each sector is defined and what the requirements are. For example, Non-Permitted Urban Stormwater is included both as its own sector and with the "general nonpoint source" sector with allocations of 75% and 88% reductions, respectively.

This should be revised to reflect the 75% reduction being sought from this sector. Similarly, atmospheric deposition is specified as both an 88% reduction and an 11% reduction.

Page 62. Table10-1 is confusing because it indicates general nonpoint source and background captures non-permitted urban stormwater and atmospheric deposition, then lists these two sources separately. While they are unified for existing loads, they are listed separately for allocations. This could be displayed more clearly by displaying the source sectors as below or you could add notes to the 75% and 11% required reductions. (EPA comment #15)

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. For clarity, particularly with regard to implementation, DEQ used different terminology for labeling source categories in the TMDL and WQMP than was used for labeling source categories in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. No sector is assigned more than one allocation, as summarized in the revised Table 10-1.

C_J#38: Suggested Change ID #136

Description: Editorial - Definition of TMDL

Comment: Page 13. The second sentence in the first paragraph states that "The amount of pollutant…and is calculated as the TMDL". We suggest changing the end of that sentence to "…is calculated as part of the TMDL". The parenthetical statement that follows seems to indicate the "assimilative capacity" has the same meaning as "TMDL" whereas TMDL includes the WLA+LA+MOS+ reserve capacity.

Response: DEQ agrees and has made this change.

C_J#39: Suggested Change ID #137

Description: Editorial - Table 1-1

Comment: Page 15. To be consistent with the values listed in the WQS section, we suggest also adding the numeric values in the respective sections in addition to percentage.

Response: The percent reductions are the surrogates we are using for allocations. We are not including the numeric values of the estimated loads used to calculate the percent reductions in order to avoid confusion.

C_J#40: Suggested Change ID #138

Description: Editorial - Table 1-1 #2

Comment: Page 15. "percent reduction g Total Mercury/day". We suggest "percent reduction in total mercury loading"

Response: DEQ must include a unit per day reduction to meet the court order. DEQ revised the language for clarity.

C_J#41: Suggested Change ID #139

Description: Editorial - Reserve Capacity

Comment: The reserve capacity is unclear as it currently reads in the table. We suggest changing the sentence to "…1% of the loading capacity or 0.42 g of total mercury per day".

Response: We are using the surrogate of percent reduction to set the TMDL. The suggested change "1% of the loading capacity or 0.42 g of total mercury per day" implies that the magnitude of 0.42 g can be substituted for the 1%. This is not the case. The 0.42 g is the result of applying the 1% to the estimated total load, which was used in the TMDL analysis. This is a subtle difference, but very important.

C_J#42: Suggested Change ID #140

Description: Editorial - Land use

Comment: Page 20. A period is needed after "TMDL" in the fourth sentence in the first paragraph.

Response: DEQ agrees and has corrected this typographical error.

C_J#43: Suggested Change ID #141

Description: Editorial - Mercury Cycling

Comment: We suggest replacing the Eckley et al, 2015 reference which is from a power point presentation for a conference and is not available on the internet. That old reference is: Eckley, C., Eagles-Smith, C., Kowalksi, B., Tate, M., Krabbenhoft, D., Danehy, R., & Woodruff, L. (2015). Effects

of timber harvest on mercury cycling in the Pacific Northwest, USA. Joint Assembly of the AGU, CGU, GAC and MAC Conference. Montreal, Canada.

We suggest replacing the old reference with the peer-reviewed (and publicly available) paper, which covers the same information as was in the presentation: Eckley, C.S., Eagles-Smith, C., Tate, M.T., Kowalski, B., Danehy, R., Johnson, S.L., Krabbenhoft, D.P., 2018. Stream mercury export in response to contemporary timber harvesting methods (pacific coastal mountains, Oregon, USA). Environ. Sci. Technol. 52, 1971-1980.

Response: DEQ agrees and changed this reference.

C_J#44: Suggested Change ID #142

Description: Editorial - Explanation of models

Comment: Section 6.1. We suggest changing "…determining the load capacity the revised TMDL is based on two fundamental methodological…" to "determining the load capacity for the revised TMDL consists of two fundamental methodological…" in the very first line of the first sentence in the paragraph.

Response: DEQ agrees and has made this change.

C_J#45: Suggested Change ID #143

Description: Editorial - Food Web Model

Comment: The word "Topic" in the title line for Table 6-1 should be changed to "Trophic". p. 31 states that the estimated BMF values "fall near or within 90% confidence intervals by trophic levels on the national values." This should instead say "near or within 95% confidence intervals". The error is due to a misstatement in TT's previous round of comments.

Response: DEQ agrees and has made this change.

C_J#46: Suggested Change ID #144

Description: Editorial - Food Web Model #2

Comment: p. 31 is missing a reference in the last paragraph (currently listed as a placeholder, "(ref)").

Response: DEQ agrees and has added this reference.

C_J#47: Suggested Change ID #145

Description: Editorial - Table 6-2 Biomagnification

Comment: The “L” in the formula “L/kg” should be defined in a footnote to the table.

Response: “L” is the accepted symbol for liter. Adding footnote for “L” is not necessary.

C_J#48: Suggested Change ID #146

Description: Editorial - Mercury Translator Equation

Comment: p. 32. The word “to” should be added between the word “equation” and the word “go” in the third sentence in the first paragraph in this section.

Response: DEQ agrees and revised wording in this paragraph.

C_J#49: Suggested Change ID #147

Description: Editorial - Mercury Translator Equation #2

Comment: Page 32 Section 6.1.2. It is a bit confusing stating that the translator was for different fish species in the following sentence: “In the same manner in the 2006 TMDL, DEQ used an empirical translator equation go from dissolved methylmercury information to total mercury in water column for the different fish species using more recent observed data.” Perhaps change to “In the same manner in the 2006 TMDL, DEQ used an empirical translator equation to go from dissolved methylmercury information to total mercury in the water column using more recent observed data. The translator was applied to estimate target total mercury concentrations based on critical dissolved methylmercury exposure concentrations for different fish species.”

Response: DEQ agrees and has made this change.

C_J#50: Suggested Change ID #148

Description: Editorial - Mercury Translator Equation - Terminology

Comment: Section 6.1.2 page 33. The use of non-contemporaneity in the first and fourth sentence of the second paragraph might not be understood by all readers. Suggest changing it to a more commonly understood phrase, e.g. not collected at the same time and place.

Response: Substitute “not collected at the same time and place” for “non-contemporaneity” in the document as suggested in comment.

C_J#51: Suggested Change ID #149

Description: Editorial - Mercury Translator Equation #3

Comment: Section 6.1.2. We suggest rewording the second sentence in the first paragraph on page 35 to:

The 0.14 ng/l total mercury target level in water needed to achieve the fish tissue criteria in Northern Pikeminnow was used to calculate a single load capacity of total mercury for the entire Willamette Basin.

Response: DEQ agrees and has made this change.

C_J#52: Suggested Change ID #150

Description: Editorial - Figure 6-4

Comment: Section 6.1.3 page 36. For Figure 6-4, change to bidirectional arrows as was done for the other conceptual models in the report.

Response: DEQ agrees and has made this change.

C_J#53: Suggested Change ID #151

Description: Editorial - Linkage analysis #1

Comment: Section 6.1.3 page 36. Add the word “to” between the word “Model” and the word “estimate” in the first sentence of the first paragraph on page 36.

Response: DEQ agrees and made this change.

C_J#54: Suggested Change ID #152

Description: Editorial - Linkage analysis #2

Comment: Figure 6-6 on page 38. Figure 6-6 is intended to represent the hydrologic response units however, the specific boundaries of the units are not very clear. Please edit the figure to make the boundaries more visible.

Response: The purpose of the schematic is to communicate the conceptual framework applied in the development of watershed hydrologic response units (HRUs). HRUs represent unique combinations of soil type, land use (pervious and impervious land), slope, and weather, thus, there are hundreds of unique HRUs included in the Willamette River Basin HSPF model. This schematic represents the HRU development process for conceptual/informational purposes. The true boundaries are quite complex and although HRUs are spatially explicit, variance in these characteristics over the landscape results in cases where neighboring cells represent alternative HRUs. Due to the resolution and complexity of the HRU grid the boundaries cannot be shown more visibly.

C_J#55: Suggested Change ID #153

Description: Editorial - Atmospheric Deposition #1

Comment: Section 6.1.4.1. Page 40. We suggest altering the following sentence: “Modeling found that most of the atmospheric sources of mercury deposited in the Willamette Basin originate outside the basin.” to: “Research indicates that most of the atmospheric sources of mercury deposited in the Willamette Basin originate outside the basin.”

Response: DEQ agrees and has made this change.

C_J#56: Suggested Change ID #154

Description: Editorial - Atmospheric Deposition #2

Comment: Section 6.1.4.2. Page 40. We suggest changing the following sentence: “The method used to account for the mercury level from soils was to estimate potency factors for use in the Mass Balance Model.” to: “The method used to account for the mercury level from soils was to estimate potency factors (mass of mercury per mass of sediment expressed as uk/kg) for use in the Mass Balance Model.”

Response: DEQ agrees and has made this change.

C_J#57: Suggested Change ID #155

Description: Editorial - Groundwater Loading

Comment: Section 7.8 page 43. Regarding paragraph 1: “In the Trask River Watershed Study (Eckley et al., 2018) baseflow THg concentrations in a forested watershed in coastal Oregon were consistently extremely low and generally less than 1 ng/L…”

The average concentrations from this study were around 0.7 ng/L. If we consider this “extremely” low, then what does that say about the proposed TMDL concentration that is an order of magnitude lower (0.14 ng/L)?

Consider removing the word “extremely” from the sentence.

Response: This comment must be from a previous version of the draft TMDL because there is no Section 7.8. The referenced statement now appears in Section 6.1.4.3 and was corrected based on EPA input to read “low.”

C_J#58: Suggested Change ID #156

Description: Editorial - Excess Load

Comment: End of section 7.2. Missing word. We suggest changing the last sentence on this page from “…and was used calculate allocations and remaining parts…”, to “…and was used to calculate allocations and remaining parts…”

Response: DEQ agrees and made this change.

C_J#59: Suggested Change ID #157

Description: Editorial - Seasonal Variation #1

Comment: Section 8 page 46. Missing word. We suggest changing the second sentence in the first paragraph in this section from "methylmercury concentrations fish tissue was considered by", to "…methylmercury concentrations in fish tissue was considered by"

Response: DEQ agrees and has made this change.

C_J#60: Suggested Change ID #158

Description: Editorial - Seasonal Variation #2

Comment: Section 8 page 46. Regarding: "In addition to the observed data that was collected for all of the seasons, DEQ determined that the different components of the linked models, especially the Mass Balance Model, adequately represent the seasonal variation of sources and processes that ultimately control the methylmercury concentration in fish tissue of the Willamette Basin."

Comment: This is a hard to follow sentence—suggest that it is re-written for clarity.

Response: DEQ agrees and has edited this sentence for clarity as follows: "The seasonal variation of the sources and processes that control the methylmercury concentration in fish tissue were captured in the observed data and the modeling approach. The observed data used in the TMDL analysis was collected throughout the year and across multiple years. DEQ determined that the Mass Balance model simulation ran at an hourly time-step adequately represents the seasonal variation of sources and processes of the Willamette Basin."

C_J#61: Suggested Change ID #159

Description: Editorial - Figure 5-19

Comment: Page 48. Regarding: "Figure 5-19 of the TMDL Technical Support Document indicates that 86 percent of surface runoff and 91 percent of sediment erosion may be affected by the natural and anthropogenic activities within the forestry, agriculture and urban development land use areas."

Comment: The meaning of this sentence is unclear. Recommend that it be re-written.

Response: The percent contributions given in Figure 5-19 of the TSD are for land use categories and could be misinterpreted for the land management activities given in the sentence proceeding the one addressed in this comment. In other words, "Forest" is not equivalent to "Forestry" in our analysis. The sentence was deleted to avoid this confusion.

C_J#62: Suggested Change ID #160

Description: Editorial - Impoundments

Comment: Section 9.2.2 page 48. Regarding: “In assessing impoundments in the Willamette Basin as sources of mercury, an important consideration is whether mercury is transported from reservoirs downstream.”

Comment: Suggest changing “mercury” to “methylmercury”

Response: DEQ agrees and has made this change.

C_J#63: Suggested Change ID #161

Description: Editorial - Allocations #1

Comment: Section 10, page 63. The equations for distributing the load allocations reference using the third column of Table 10-1. The percentages are actually from the eighth column of that table.

Response: DEQ agrees and has made this change.

C_J#64: Suggested Change ID #162

Description: Editorial - Allocations #2

Comment: Section 10, page 63. The word “reaming” in the first sentence in the second paragraph should be changed to “remaining”.

Response: DEQ agrees and made this change.

C_J#65: Suggested Change ID #163

Description: Editorial - Load allocations for nonpoint sources

Comment: Section 10.1 page 65. Text references “the 10 percent reduction for atmospheric sources” in the middle of the first paragraph; however, the allocations show an 11 percent reduction to provide a 1 percent reserve capacity.

Response: DEQ agrees and has made this change.

C_J#66: Suggested Change ID #164

Description: Editorial section 10.2 - insignificant sources of mercury

Comment: Section 10.2 page 67. “Insignificant” is used to describe some sources in the first sentence of the second paragraph. Given the bioaccumulative nature of mercury, we suggest using other terminology, such as “very minor”, to describe very small sources.

Response: DEQ agrees and has made this change.

C_J#67: Suggested Change ID #165

Description: Editorial - TSS

Comment: Table 10.2 page 70. Comment #1: This surrogate table is taken from Table 12 in Appendix H. The column headers appear to have been transcribed incorrectly as the data in the third and fourth columns of Table 10-2 are “Cumulative Reduction in THg Concentration” and “Estimation Reductions in TSS Concentration” in Table 2.
Comment #2: Also, more significant digits are presented in Table 10-2 than in the source table.

Response: We agree that all significant digits should align between Table 10-2 and Table 12 in Appendix H. We set significant digits to the tenth (0.1) spot.

We propose to make the following changes.

In Appendix H, the column headed “Estimated Reductions in TSS Concentration (mg/L)” should be “Allocation for Maximum Instream TSS (mg/L)”.
The column headed “Cumulative reduction in THg concentration (mg/L)” in Table 12 of Appendix H should be re-titled “Total reduction in TSS concentration (mg/L)”.

In Table 10-2, the column headed “Reduction TSS Concentration (mg/L)” should be re-titled “Total reduction in TSS concentration (mg/L)”.

C_J#68: Suggested Change ID #166

Description: Editorial - Allocations spreadsheet

Comment: Online link - The descriptions on the “Categories” tab cannot be fully seen and the sheet is protected.

Response: DEQ has corrected this error.

C_J#69: Suggested Change ID #167

Description: Editorial - “Responsible person” term not well defined #2

Comment: Section 13.1 page 73. The term “responsible persons” is used in second and third paragraphs of this section. Like “DMA”, “Responsible persons” has a specific legal meaning in DEQ regulations for which the definition should be presented.

Response: DEQ must address the elements of a TMDL described in OAR 340-042-0040 (4) (a-l) in order to meet the rule as well as to attain approval from EPA. One of the elements required in a TMDL is, "Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans," (OAR 340-042-0040 (4) (G). DEQ has authority to identify persons responsible for implementing the TMDL, which includes but is not limited to DMAs. DEQ uses the term "responsible persons," to identify "persons…responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans."

C_J#70: Suggested Change ID #168

Description: Editorial - Ag WQMA rules

Comment: Section 13.3.1.4 page 82. The word "protecting" in the first sentence in the first paragraph under this heading should be changed to "protect".

Response: DEQ revised the wording in this paragraph.

C_J#71: Suggested Change ID #169

Description: Editorial - ODSL

Comment: Section 13.3.1.6 page 88. Regarding: "Mercury may occur, or is likely or known to occur on the following types of state-owned land in the following ways…"

Comment: At the levels of concern in this TMDL, Hg is guaranteed to be everywhere in the basin. We suggest changing to: "Mercury occurs on all state-owned lands…"

Response: DEQ agrees and made this change.

C_J#72: Suggested Change ID #170

Description: Editorial - Water Delivery and Conveyance Systems #1

Comment: Section 13.3.1.22 page 110. Regarding: "Higher methylation rates produce more bioavailable mercury." Comment: In much of the Hg literature, "bioavailable Hg" refers to inorganic Hg that is bioavailable to methylating microorganisms. In this sentence bioavailable Hg is used to refer to MeHg.

Response: DEQ agrees and has changed the wording to: "Higher rates of MeHg production can result in reservoir fish having higher MeHg concentrations."

C_J#73: Suggested Change ID #171

Description: Editorial - Water Delivery and Conveyance Systems #2

Comment: Section 13.3.1.22 page 110. Regarding: "…and upland activities that may contribute elemental mercury to reservoirs." Comment 1: Change elemental Hg to inorganic Hg.
Comment 2: Also, it is unclear what upland activities are being referred to in this sentence. Please explain.

Response: DEQ revised this paragraph to clarify factors that may contribute to increased rates of methylation in reservoirs.

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51. Comments from: Mulder, Sidney of Polk County

M_SP#1: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

M_SP#2: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and

agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these

cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

M_SP#3: Suggested Change ID #320

Description: General - TMDL revisions need additional review and comment period

Comment: Lastly, it is requested that any permit revisions have an additional review and comment period to voice further concerns about any future permit changes.

Response: DEQ interprets that the commenter misconstrued the TMDL as a permit and intended the comment to request an additional period for review and comment prior to finalization of the TMDL. DEQ strives to consider all comments received during the public comment period and make changes to the TMDL, as appropriate. DEQ provided a 66 day comment period, in alignment with OAR 340-042-0050. In addition, DEQ established a 24-member Advisory Committee of stakeholders, which provided input on TMDL development over more than two years. The Willamette Mercury TMDL must be acted on by EPA on the court-mandated deadline of November 30, 2019. Therefore, no additional review and comment opportunity can be provided. However, DEQ's Basin Coordinators are committed to continue working with designated management agencies and responsible persons following issuance of the TMDL to develop implementation plans that meet the requirements of the final TMDL and to implement those plans going forward.

M_SP#4: Suggested Change ID #372

Description: Allocations & WQMP - Development density (rural vs urban) should be taken into account - remove non-permitted urban stormwater as a sector

Comment: There is no legal category of "Non-Permitted Urban Stormwater." The Clean Water Act, by definition, addresses urban stormwater by specifically defining urban area (UA) and requiring stormwater permits for UAs. The Phase II Final Rule required the NPDES permitting authority (i.e., DEQ) to develop a set of designation criteria to all small MS4s located outside of a UA serving a jurisdiction with a population of at least 10,000 and a population density of at least 1,000 people/square mile. Washington County's rural population density is approximately 44 people/square mile, or 95% short of an UA. This fact demonstrates the County is not and cannot be a defined UA, nor a small MS4, nor the non-existent "Non-Permitted Urban Stormwater" discharger.

The TMDL is not an MS4 program, and not a permit program, although an NPDES permit can include implementation activities of a TMDL program. Nonetheless, Washington County has TMDL responsibility only in the rural area, since Clean Water Services (a Service District) is the NPDES sole permittee for the entire urban area of the County.

There is a strong correlation between stormwater pollutants and development density, which is why counties should not be required to uphold the same permit requirements as incorporated communities. This matter was contemplated during the development of the MS4 Phase TI permit. After number of concerns were raised by counties, all counties were put into the “Small Community” category even though they exceed 10,000 people. The MS4 Phase II definition of Small Communities is, " … any permit registrant that has a population of less than 10,000 people or is a county that is the sole permit registrant/applicant. If the county is a co-registrant at the time of permit coverage or becomes a coregistrant at any time of permit coverage under this permit, it is not eligible for this exemption." This logic should be applied to this TMDL permit as well by allowing all counties to be subject to the same requirements as communities with a population of< 5,000 people.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities and roads. DEQ supports these core management programs, such as enforcement of prohibited pollutants, and ensuring erosion control measures are included in county building and grading permits as good approaches for county management. In addition, DEQ included a table of example BMPs and strategies most relevant to county activities.

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52. Comments from: Abraham, Kyle of Oregon Department of Forestry

A_K#1: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon’s farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

A_K#2: Suggested Change ID #270

Description: Editorial - Executive Summary 2.2 Landuse percent and NPS definition

Comment: (pg. 11) "Of the many different types of land use that exist within the Willamette Basin, forestry, agriculture, and urban uses dominate across the basin." ODF Comment: Please revise this by stating that land-uses that contribute to non-point sources dominate (X%) the total land area of the Willamette Basin. Also, please define non-point sources here.

Response: DEQ revised the TMDL to reflect this comment by adding examples of point sources and changing the sentence: "Of the many different types of land use that exist within the Willamette Basin, forestry, agriculture and urban uses dominate across the basin" to: "Of the many different types of land use that exist within the Willamette Basin, forestry, agriculture and urban uses comprise most of the area within the basin. Management actions on these land uses influence the amount of mercury from these sources that reach streams and rivers in the basin."

A_K#3: Suggested Change ID #271

Description: Source Assessment NPS - Streamflow Modifications

Comment: Establish a monitoring program to study the effects of flow modifications (reservoirs, dams) on Hg cycling in the watershed.

Response: The DMAs and responsible persons who own the largest reservoirs in the basin will conduct initial assessments and monitoring to evaluate factors that are affecting methylation rates, and then develop a plan to reduce those methylation rates. A monitoring program such as the one proposed by the commenter is a reasonable assessment approach, but should not postpone taking action to reduce the methylation rate.

As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expanded to allow for further analysis to better represent mercury sources, transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

A_K#4: Suggested Change ID #272

Description: Loading Capacity - Assumption of equal contributions for all HUCs

Comment: Recommend that the core assumption of equal contributions across watersheds be checked as part of implementation monitoring plans. Need to determine if there are particular HUC 8's that are driving the mercury contamination levels in the Willamette Basin

Response: Estimation of the particular contribution among the HUC08s will be one of the objectives in the Monitoring and Assessment Strategy

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A_K#5: Suggested Change ID #273

Description: Modeling - Clarify whether models accounted for uncertainty on internally/externally produced methylmercury

Comment: Clarify whether the model accounted for the uncertainty re: internally/externally produced methylmercury, or any way to quantify this uncertainty. Recommend monitoring in DEQ's implementation plan to get a better understanding of the potential linkages between carbon sources in water (dissolved organic carbon and particulate organic carbon) as one approach to improve understanding of mercury cycling and export, particularly in the forest environment.

Response: The uncertainty in the models and how it was accounted for is discussed in Sections 5, 6, 7 and 11 of the TMDL and Sections 2, 3, 4 and 5 of the TMDL Technical Support Document. DEQ added clarifying language to the noted TMDL sections as to conservative assumptions throughout the TMDL evaluations to address uncertainty. DEQ intends to use monitoring and modeling during implementation, including a better evaluation of reservoir methylation processes, to improve our representation of mercury/methylmercury system in the Willamette Basin. In addition, the Assessment and Monitoring Strategy will identify approaches for continuing to improve our understanding of mercury in the Willamette Basin.

A_K#6: Suggested Change ID #274

Description: Editorial - Sec. 6.1.4

Comment: Clarify how non-point sources vs. point sources were distinguished by land-use and how non-point and point sources were teased apart in Table 6-7. Add discussion on the connection between Table 6-7 and Table 1-3 for reader's benefit.

Response: Point sources are permitted and the information associated with the permit and facility characteristics was used to calculate the point source contribution. The land use was not used to distinguish point sources from nonpoint sources. Information in Table 6-7 is not directly related to items in Table 1-3. The information from Table 6-7 is used in the discussion in each of the sections referenced in Table 1-3.

A_K#7: Suggested Change ID #275

Description: Source Assessment NPS - Estimated Groundwater contribution

Comment: Groundwater as a mercury source should be included as a key monitoring opportunity in the implementation plan

Response: DEQ agrees that groundwater source need to be better characterized and intends to use monitoring and modeling during implementation to improve our representation of mercury/methylmercury system in the Willamette Basin.

A_K#8: Suggested Change ID #276

Description: Editorial - Sec 6.2

Comment: [Sec. 6.2]: "The great majority of the load (greater than 95%) is from nonpoint sources…..point sources accounting for less than five percent." Please be specific and change to: 'Based on the model output, nonpoint sources contributed 95.7% of the total load and point sources contributed 4.3%.

Response: DEQ did not make this change. Specificity can imply certainty and DEQ's language comports with the acknowledged uncertainty of the modeled load estimates in a statement conflating the source categories into just two bins – nonpoint and point sources. Table 6-7, directly below the text in the comment, provides the estimated loads from all source categories modeled.

A_K#9: Suggested Change ID #277

Description: Source Assessment NPS - Forestry load

Comment: Modeling indicates that a significant portion of the load is attributable to forestry and other land disturbing activities. ODF looks forward to addressing these concerns as part of the implementation plan under the FPA, both with describing its approach to sediment control and with identifying priority areas to clarify areas of uncertainty through monitoring.

Response: DEQ agrees that identifying priority areas for mercury and sediment movement is an important element of adaptive management and will help nonpoint source DMAs focus efforts and resources.

A_K#10: Suggested Change ID #278

Description: Load Allocation - large reduction for NPS

Comment: Identify the activities that have not implemented mercury minimization measures, leading to a large reduction requirement being applied for nonpoint sources.

Response: DEQ acknowledges that many DMAs have already been implementing programs and best management practices that reduce mercury and sediment movement in the Willamette Basin. DEQ anticipates there are different or additional measures that can be taken in order to achieve further reductions. Examples of measures that nonpoint sources can focus on include but are not limited to increased monitoring and analysis of BMP effectiveness in reducing sediment movement, increased efforts to protect and enhance riparian areas, increased efforts to reduce erosion and sediment movement from road networks. DEQ also anticipates that the Assessment and Monitoring Strategy DEQ and EPA are developing for the Willamette Basin will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL.

A_K#11: Suggested Change ID #279

Description: Load Allocations - TSS - Instream Surrogate Allocations

Comment: TSS should not be used as a surrogate for mercury concentrations at this time given the current uncertainty of the relationship between THg and TSS. We recommend further exploration of this proposed surrogate as part of the monitoring in the implementation plan.

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the strong relationship DEQ's analysis found between Willamette Basin TSS and total mercury measurements. In Section 10.3 DEQ established TSS surrogate targets and their use, which will be used as one tool for evaluating TMDL implementation effectiveness. The use of TSS surrogate targets and other tools will also be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A_K#12: Suggested Change ID #280

Description: WQMP - Implementation Plan - online posting requirement

Comment: It would be more efficient for implementation plans to be posted on DEQ's webpage under the relevant TMDL rather than to a DMA website.

Response: DEQ agrees that providing copies or links to DMA plans on DEQ's website would be an improvement and will consider moving forward with this recommendation outside of the Mercury TMDL process. DEQ also concludes that it is important for DMAs to make their plans available on their own websites as they may incur traffic from online users that may not access DEQ's website.

A_K#13: Suggested Change ID #281

Description: WQMP - Implementation Plan Proposed Management Strategies

Comment: If the included list of management measures is not prescriptive, its inclusion could be confusing to readers who see that listed measures are not in the final implementation plan and it may be assumed that they were missed.

Response: DEQ agrees and revised language in the introductory paragraph of section 13.3 to provide more clarity about the management measures described in this section.

A_K#14: Suggested Change ID #283

Description: Editorial - Table 13-4 ODF Rules Related to Water Quality and Erosion Control

Comment: Recommend including Reforestation (OAR 629-610-0000 through 629-610-0090) and Afforestation rules (OAR 629-611-0000 through 629-611-0020). ODF is also considering where and how to address fire prevention, managed fire, and wildfire as an aspect of this TMDL and is looking forward to having these discussions with DEQ.

Response: DEQ made this revision.

A_K#15: Suggested Change ID #284

Description: Editorial - Table 13-5

Comment: Change references to "Prescriptive rules for forest operations" to "Prescriptive and outcome-based rules for forest operations" (row 1) to better reflect the different approaches used in the FPA. Some rules are indeed prescriptive but others describe an outcome that landowners and operators can use a variety of means to achieve. Please add a bullet to row 4 (roads) with text: "Cease active road use during wet weather when roads have deep ruts or covered by a layer of mud that results in visible increases in stream turbidity (OAR 629-625-0700). Change reference to "Partnership for Forestry Education (last row)".

Response: DEQ made these revisions.

A_K#16: Suggested Change ID #286

Description: WQMP - Proposed Management Strategies - Department of Forestry - compliance audits

Comment: Reference to ODF Compliance Audits (Table 13-5 rows 1 and 11). Thank you for including this important ODF program.

Response: DEQ agrees that this is an important ODF program to highlight in the TMDL WQMP.

A_K#17: Suggested Change ID #287

Description: WQMP - Proposed Management Strategies - Department of Forestry - roads

Comment: Hydrologically-connected roads, potentially unstable road prisms, and metrics informing at-risk stream crossings are already included in the compliance audit protocol. Road inventories are also

included as an Oregon Plan voluntary measure. We look forward to discussions with DEQ about how existing programs can address these concerns as part of the implementation plan.

Response: DEQ acknowledges that existing programs may be in a good position to facilitate and support implementation of this TMDL. DEQ also looks forward to continued collaboration between agencies.

A_K#18: Suggested Change ID #288

Description: WQMP - Proposed Management Strategies - Department of Forestry - tethered logging

Comment: For tethered logging, ODF has already created guidance for landowners and operators for the information required to support a Plan for Alternate Practice (PFAP) to operate this new cutting, and sometimes yarding, system on steep slopes. We look forward to discussing with DEQ the information provided in the PFAP and how this existing business process can address any concerns.

Response: DEQ agrees that existing programs may be able to facilitate and support implementation of this TMDL. DEQ also looks forward to continued collaboration between agencies.

A_K#19: Suggested Change ID #301

Description: WQMP - Implementation Plans - Reservoir management monitoring

Comment: ODF is interested in the recommended monitoring and calibration efforts in this section as a model for what monitoring would be of highest interest for DEQ in the non-federal forest environment.

Response: This is one of the topics that DEQ will work to better understand during implementation through monitoring, assessment and updates to the analysis, which includes modeling. DEQ is working with EPA to develop a draft Assessment and Monitoring Strategy. DEQ will work with the DMAs, including ODF, to refine this Strategy and for identifying priorities for better understanding methylmercury and total mercury in the basin that can then be used for adaptive management of the TMDL.

A_K#20: Suggested Change ID #302

Description: WQMP - Implementation Plans - Reporting requirements for DMAs and RPs

Comment: ODF does not currently have a mechanism to report on watershed basins and will work with DEQ on the most efficient and effective way to create reports that meet TMDL needs. Appreciate the timeline flexibility and also look forward to discussing monitoring and adaptive management processes.

Response: DEQ appreciates ODF's participation and engagement during the TMDL development process and looks forward to collaborating with ODF after TMDL issuance to develop and refine monitoring and reporting approaches.

A_K#21: Suggested Change ID #303

Description: WQMP - Implementation Plans - global sources

Comment: In Timeline for Attainment section, ODF appreciates the recognition of global mercury emissions and air deposition as the primary mercury source in Oregon. Messaging to other entities (local, regional, national, global) about this issue is important.

Response: DEQ agrees with the comment.

A_K#22: Suggested Change ID #304

Description: WQMP - Implementation Plans - Monitoring for out of state Hg contamination

Comment: DEQ should engage in monitoring to track and distinguish, by monitoring and modeling, in- versus out-of-state air contamination rates in order to understand what is driving mercury contamination rates in our state.

Response: This is one of the topics that DEQ will work to better understand during implementation through monitoring, assessment and updates to the analysis, which includes modeling. DEQ is working with EPA to develop a draft Assessment and Monitoring Strategy to better understand the methylmercury and total mercury in the basin. The information from this Strategy will be used for adaptive management.

A_K#23: Suggested Change ID #305

Description: WQMP - Implementation Plans - Timely progress by Forestry

Comment: A collaborative approach to setting reasonable and attainable expectations for forest practices is best. A full accounting of the Hg cycle in Oregon is needed to adequately respond, otherwise an adaptive management approach is needed.

Response: DEQ agrees and anticipates that the draft Assessment and Monitoring Strategy DEQ and EPA are developing for the Willamette Basin will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. DEQ plans to use adaptive management during implementation of the TMDL. Use of adaptive management is briefly described in section 13.1.2 of the WQMP.

A_K#24: Suggested Change ID #306

Description: Editorial - Section 13.5

Comment: Recommend that references to the sphere of the FPA relating to "private" forestlands be changed to "non-federal" forestlands to account for its jurisdiction over other public lands such as those owned by the state or counties.

Response: DEQ made the suggested revision.

A_K#25: Suggested Change ID #307

Description: WQMP - Monitoring and Evaluation - Sec 13.6 Assessment & Monitoring strategy

Comment: Will the "Assessment and Monitoring Strategy to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin" include expectations for non-federal forestlands?

Response: Yes, DEQ will work with DMAs where possible to collect information, including monitoring data, to improve our representation of mercury/methylmercury system in the Willamette Basin. In addition, DEQ is working with EPA to develop the draft Assessment and Monitoring Strategy and will seek DMA input on this Strategy. DEQ expects the Strategy to help guide efforts on better understanding mercury in the basin.

A_K#26: Suggested Change ID #308

Description: Editorial - Table 13-22

Comment: Please add ODF to the list of agencies involved in the EQIP Program.

Response: DEQ made this revision.

A_K#27: Suggested Change ID #309

Description: Editorial - Table 13-22 - Add EFRP

Comment: Please add the Emergency Forest Restoration Program (EFRP)

Response: Thank you for the additional resource information; DEQ made this revision.

A_K#28: Suggested Change ID #310

Description: Reasonable Assurance - Validate proportionality approach to allocations

Comment: Recommend that monitoring plans include monitoring to validate using the proportionality approach to allocate aggregated LAs and WLAs

Response: This is one of the topics that DEQ will work to better understand during implementation through monitoring, assessment and updates to the analysis.

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53. Comments from: Geist, Greg of Clackamas County and Water Environment Services

G_G#1: Suggested Change ID #58

Description: Modeling - Describe what "potency factors" are and how they are derived. Provide references or details for re-emission and retention rates

Comment: Section 6.4.1.2, page 40. The third sentence in the first paragraph in this section states that "The method used to account for the mercury level from soils was to estimate potency factors for use in the Mass Balance Model". This is followed by: "The potency factors varied with geology, soil properties and land use type. The main effect of land use was the retention and re-emission rates related to the vegetative cover (e.g. forest, shrub, or cultivated land). Using this approach, several potency factors for soils were estimated and are listed in Table 6-6."

This is the first time in the text that the idea of "potency factors" is introduced. It is unclear what they are or how they were derived. Additional text should be added to explain these and/or a reference should be provided where more information is available. Additionally, from the text it sounds like re-emission and retention rates were used for each land use type to calculate potency factors. What re-emission rates were used for this purpose? A citation or additional detail should be provided.

The same paragraph included the following sentence: "There was not a sufficient amount of data to determine whether there was significant variation between HUCs for land cover other than forest or shrub and single values were used for each land use for the entire basin."

It is unclear what data is needed to calculate a potency factor. What is the source of this data for forest and shrub lands and why is it not available for other land uses? And if potency factors are addressed in the TMDL's draft Technical Support Document, then it would be helpful to refer the reader to the applicable section and/or page number.

Response: The Technical Support Document Section 5.3.2 discusses soil Hg model input development, including soil potency factors (mass of mercury per mass of sediment expressed as uk/kg). DEQ has revised the TMDL with a reference to the Technical Support Document and a definition of potency factor.

G_G#2: Suggested Change ID #115

Description: WQMP - Stormwater - impact to county staff time

Comment: Section 13.3.1.11 Local Government: Cities and Counties

One of our most significant concerns with the TMDL is the extension of the six minimum stormwater control measures to county areas outside of those already covered by our MS4 Phase II NPDES permit.

This requirement would be a significant impact to most counties. The six minimum control measures were originally designed to be implemented within urbanized areas not in rural, less densely populated areas such as where Marion County's TMDLs would take effect. Due to the geographic range covered by county boundaries, implementing these requirements would take significant time and resources without a clear benefit to water quality. County staff could be required to travel as far as 60 miles (about one hour each way) to visit sites implementing these minimum measures.

The increased level of implementation (financial, political, technical) as laid out in the Draft Mercury TMDL creates an unacceptable cost/benefit imbalance. This is especially true as a rural area management DMA (Linn County), with a de minimis effect on mercury. The necessity of creating new staff positions, reporting mechanisms, field review, and enforcement is a financial impact on the County that is not going to change mercury levels. Linn County (and also Washington County) is concerned regarding application of an Illicit Discharge & Detection Elimination program regarding mercury loading for the rural area. This program and EPA guidance targets industrial, commercial, residential urban, and municipal activities such as landfills, fleet storage, etc. Our biggest concern is the cost of an outfall field survey over 2,297 square miles of rural valley, hills, and mountains — which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Again, we are talking about controlling less than 1% of the Mercury in the form of uncontaminated sediment while there are not any proposed controls for 99% of the problem as proposed by the DEQ. Why is that happening?

[Similar language from Washington County]: Our biggest concern is the cost of an outfall field survey over 712 square miles of rural hills – which simply does not make sense. While this is required (as one of the six Minimum Management Measures) in Urban Phase 2 jurisdictions, they are still cities, and applicable where the MS4 serves an urban population. Perhaps the document could address what a rural area Nonpoint Source IDDE program would entail.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Note that DEQ is not requiring an outfall field survey as part of the core management program.

G_G#3: Suggested Change ID #129

Description: WQMP - Stormwater - requirements for current MS4 permit holders

Comment: Nonpoint source stormwater management requirements for MS4 Permit holders (Section 13.3.1.11.1) TMDL Text: As DMAs for nonpoint sources of mercury, MS4 permit holders must also implement the six stormwater control measures, as described in Table 13-10, in their jurisdictional areas outside of the urbanized area covered by their permit. (p96)

Comment: The application of the MS4 six minimum measures in non-MS4 areas is problematic, particularly in Portland which has a combined sewer area that is already covered as a separate source in

the TMDL and has a large area served by Underground Injection Controls (UICs), which is regulated by the Safe Drinking Water Act and covered by the City's Water Pollution Control Facility (WPCF) UIC permit. Please clarify that DEQ's intention for these non-MS4 areas is to rely on existing regulatory mechanisms and not the six minimum MS4 measures. Please clarify further that the education and outreach effectiveness evaluation listed in Table 13-10 does not apply to existing MS4 Phase I permit registrants, as it is not a requirement in Section 13.3.2.2.1 of the WQMP and Phase I communities are already conducting education activities as required by the MS4 permit. Furthermore, the City is concerned that DEQ's broad-brush approach with the six minimum measures takes limited DMA and DEQ resources away from more important priorities. The rationale for such an approach was not adequately addressed in the TMDL, as it was not demonstrated how each of the six measures will actually contribute to reductions of mercury. The Illicit Discharge Detection and Elimination (IDDE) requirement, for example, will require tremendous resources for parties to implement with little to no effect on mercury sources, while the focus should be on erosion control.

Response: DEQ agrees with several of the comments and revised Section 13.3.1.11 in the WQMP to address needed clarifications. DEQ clarified that existing regulations related to water quality protection, such as permits associated with the Underground Injection Program to protect discharges to groundwater, will not be replaced by stormwater control measures because discharges from these areas do not go to surface water. DMAs should contact DEQ if they have questions about the applicability of required stormwater control measures in areas where other related regulations exist.

The six stormwater control measures have long been recognized by EPA and others as an effective approach in reducing pollutants from urban runoff. The control measures were not intended to address any one pollutant, but rather many pollutants found in urban stormwater, including sediment and mercury. In keeping with EPA Guidance cited in the TMDL/WQMP, implementation of wasteload allocations in stormwater permits are typically expressed in the form of best management practices. DEQ's analysis indicated that mercury is present in all land uses, including urban areas, and can be transported to waterbodies either through runoff or attached to sediment. Furthermore, many cities are already familiar with these stormwater control measures and will be able to use their extensive experience in evaluating effective urban BMPs and practices to control erosion and runoff. Note that DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

In addition, DEQ anticipates that extending the six stormwater control measures outside a city's MS4 permit area, but still within a city's jurisdiction will not be insurmountable. This "implementation gap" is likely small for most cities, some of which are already applying some of the stormwater control measures to these areas. While the six minimum stormwater measures in Table 13.10 are less prescriptive than MS4 permit requirements, MS4 permit holders may choose to implement requirements under their permit within and outside the urbanized area of their permit for implementation consistency. This approach would either meet or exceed the requirements in Table 13.10.

Finally, it is not DEQ's intention to duplicate any existing efforts of DMAs, including its public outreach and education program. To avoid any confusion, DEQ revised language in the public and education program component in Table 13.10 to clarify that DMAs must perform a qualitative assessment of at least one education and outreach component as part of TMDL annual reporting. This qualitative assessment is not the same as the requirement in the Phase I MS4 permit to conduct a comprehensive effectiveness evaluation. DEQ anticipates that MS4 permit holders would continue applying their public outreach and education programs to these "implementation gap" areas outside their permit coverage using approaches already gleaned from the effectiveness evaluation.

G_G#4: Suggested Change ID #135

Description: WQMP - Stormwater - PS and NPS - Program cost to local governments, citizens

Comment: The proposed TMDL rules will be extremely burdensome for small communities and county governments who lack the resources to design and create the type of programs needed to identify and reduce 88% of non-point source mercury pollution. Our residents expect clarity, predictability and reasonableness. We cannot justify to permit applicants that the increased burden is due to a potential 1/15th of 1% of potential mercury loading. Applicants could be subject to hiring engineers, paying for design plans, increased structural facilities, and increased County fees and other technical costs – again, in the rural area where vegetation and infiltration generally occurs.
The new requirements are trying to reduce large scale pollution that is beyond the control of local governments to handle alone.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

G_G#5: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet

mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

G_G#6: Suggested Change ID #198

Description: TMDL Target - Northern Pikeminnow as standard

Comment: In addition, the LOC again reiterates is support of the ACWA Comments dated August 29, 2019, and specifically would like to echo concerns over the underlying assumptions based on consumption of Northern Pikeminnow. We would like to have additional information regarding the use of this fish species as the water quality standard is based on fish consumption of 175 grams per day (equal to 30, 6-oz servings a month).

Response: The data and analysis used in the development of the TMDL will be available through our website. The selection of the Northern Pikeminnow to calculate the load capacity was not based on the assumption that this fish species is consumed at the rate of 175 grams per day, so DEQ does not have any additional information regarding this. Please see the Margin of Safety section of the TMDL for the rationale for the selection of Northern Pikeminnow.

G_G#7: Suggested Change ID #240

Description: WQMP - Six minimum measures not appropriate for rural areas

Comment: Section 13.3.1.11, Local Government: Cities and Counties. The District has an established working relationship with the City of Gaston (which is within the District's jurisdiction, but outside the MS4) and with Washington County (a co-implementer than also will be responsible for rural areas outside the MS4) that ensures successful cooperation to address water quality in the Tualatin basin. The comments below reflect the District's concern that the WQMP's highly prescriptive requirements will impact that relationship and divert local resources away from programs that have shown demonstrated success. The WQMP's requirement to implement the six minimum measures from the Phase II rule is not appropriate for sparsely populated regions outside of MS4 permitted areas, such as those in rural Washington County. Although much of Washington County and other counties in the basin are densely urban, the area outside the MS4 areas and outside the Urban Growth Boundaries and are distinctly rural, typified by dispersed population in agricultural and predominantly less developed areas. The six minimum measures were developed for urban areas; applying them outside MS4 permitted areas could appear to be an attempt to impose MS4 permit requirements on locations that are neither Phase I nor Phase II communities. A more tailored approach that provides the opportunity for the counties to develop control strategies better designed for the rural areas would be more effective than narrowly construed application of the six minimum control measures. Of particular concern is the specificity of the descriptions in Table 13-10 and the resource demands they will exert. This specificity does not reflect a consideration of local resources and needs, as required by the Maximum Extent Practicable (MEP) standard for municipal stormwater discharges. The MEP standard requires consideration of unique local conditions such as receiving waters, size of the community, fiscal resources, hydrology, geology, and capacity to perform operation and maintenance.

Rather than imposing these requirements on small communities and rural counties, the TMDL should describe the six minimum measures more generally and provide them as potential elements to be considered for inclusion in programs tailored to local needs and capabilities. General descriptions of the six minimum measures should not include thresholds (such as land disturbance area for construction site runoff control or post- construction) or treatment levels (such as TSS removal targets). Program elements such as mapping and inventorying hundreds of miles of roadside ditches as part of an Illicit Discharge Detection and Elimination program may not be a good use of resources. Clearly, should an illicit discharge be identified as a source of mercury, it should be controlled. Similarly, regulation of waste materials at construction sites beyond that regulated by the 1200C permit should be left to the discretion of the local government in their development of a TMDL implementation plan dependent on the likely source of mercury.

This requirement is especially significant for large counties with broad geographic jurisdiction. Counties covering broad geographic areas will need to coordinate on the six minimum measures within the urban growth boundaries of multiple cities and towns with a range of existing programs (or no programs at all, currently). This presents practical implementation challenges that take time to work through. Also, implementation of the six minimum measures in counties with large geographic areas essentially imposes an urban stormwater management program on largely rurally zoned lands (e.g., rural residential, rural commercial/industrial, etc.). The six minimum measures that are the basis of the MS4 Phase II NPDES permitting program were originally written and intended for managing runoff from urbanized areas. The imposition of these measures in a rural context lacks scientific support and poses a significant risk of unintended consequences and counterproductive actions. We do not think it is appropriate to use the Mercury TMDL as a mechanism for obtaining what is essentially MS4 Phase II NPDES permit coverage watershed wide. Given the largely rural extent of these areas, and the range of actions required to implement the six minimum measures, significant time and resources would be necessary to develop and implement storm water programs for runoff from rural lands without significant impact on or benefits for water quality.

What is the purpose or benefit of extending urban based measures to a rural area? What non-point source would we need to identify? The make-up of Benton County is such that our small staffing levels would be stretched even further as we traverse the county implementing the measures that have very little, if any benefit.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

G_G#8: Suggested Change ID #246

Description: TMDL Target - Northern Pikeminnow

Comment: Target Fish Species: The District continues to have concerns with the use of the Northern Pikeminnow as the target fish species in the TMDL, particularly around communication to the public. Unfortunately, the primary message to the public is likely to be that fish in the Willamette River are highly contaminated and should not be consumed, which is not an accurate or appropriate message. To convey a more accurate picture of fish consumption considerations in the Willamette River basin, DEQ should reconsider the use of a fish that is not widely consumed. Additionally, the use of the Northern

Pikeminnow as the target fish species establishes an unrealistic goal for the TMDL. DEQ should use more widely consumed fish to provide more meaningful and realistic shorter-term goals for in-stream mercury concentrations, perhaps with longer term targets for other fish.

Response: Commenter is referred to the discussion of the Northern Pikeminnow in Section 11 Margin of Safety for justification of its selection.

G_G#9: Suggested Change ID #248

Description: Loading Capacity - resurfacing groundwater over daily capacity

Comment: Section 7 on page #43 ("Loading capacity and excess load"): According to the draft TMDL, the river's loading capacity – the amount of mercury the river can receive and still meet water quality standards – is 42 grams/day of total mercury. In table 6-7, "resurfacing groundwater" (springs, for example) is estimated to contribute far more total mercury: 60.6 grams/day. If the estimated amount of mercury discharged by resurfacing groundwater is verified to be correct as additional data is collected in the future, and if the amount of mercury in resurfacing groundwater is naturally occurring, and not the result of human activity, then the river's loading capacity for total mercury will never be met simply due to discharges of mercury in resurfacing groundwater. This would be true even if every property owner, every DMA, and every point source discharger somehow reduce their discharge of mercury to zero. Even if everyone does their part to reduce/control mercury in the future, natural erosion of soils will contribute more mercury, and volcanic eruptions and forest fires will cause even more mercury to be discharged into the river. This apparent fact – that the river's loading capacity for total mercury will probably never be met no matter what the people of Oregon do – should be featured in a more prominent location in the TMDL, including but not limited to the Executive Summary on page #11. Oregonians should all be taking reasonable and cost-effective steps to reduce and control our discharges of mercury, since this will result in better public health and environmental outcomes. But before the TMDL is finalized, acknowledgement of the river's loading capacity and the river's natural sources of mercury should be used by DEQ to set a more realistic, attainable goal in the TMDL for future mercury control and reduction in the watershed.

Currently, there is limited understanding of natural and anthropogenic mercury loads and therefore, the TMDL should be focused on realistic, attainable goals for mercury reduction. For transparency, this inability to attain the mercury loading capacity should be featured in a more prominent location in the TMDL, including in the Executive Summary on page 11 and in Section 14 regarding reasonable assurance.

Response: DEQ acknowledges that natural sources of mercury in the Willamette Basin are a significant portion of the overall loads entering the river system. However, DEQ's expectation is that all relevant management strategies will be applied to the controllable portions of each source toward achieving each responsible entity's portion of the aggregated reductions needed.

G_G#10: Suggested Change ID #249

Description: Source Assessment PS - Table 9-4 permit issues

Comment: Section 9.4.1.2 on pages #55-57 ("Industrial Wastewater Permits"):

This section describes evaluations made of existing industrial wastewater permits. Table 9-4 does not list the Blue Heron Paper Company NPDES permit (Blue Heron Permit) and associated allocation. Prior to its expiration, the Blue Heron Paper Company duly filed an application for renewal of the Blue Heron Permit as required. Water Environment Services (as successor to Clackamas County Service District No. 1 and the Tri-City Service District) purchased the treatment lagoon, outfall, and transferred the Blue Heron Permit into its ownership in 2012 after discussion with DEQ regarding the utilization of the Blue Heron Permit to support WES' operational and regulatory needs.

WES subsequently has filed, as part of the permit renewal application for the Tri City Plant NPDES permit, a request for consideration to consolidate the Blue Heron Permit and the Tri-City Permit, which includes all TMDL allocations. DEQ has not taken action on either permits, primarily due to uncertainty around temperature TMDL issues, and both are administratively extended at this time. Until such time as DEQ takes official action with respect to the Blue Heron Permit, it must be listed as an active permit that may discharge into the Willamette River and receive an retain all appropriate TMDL allocations, including mercury. WES' acquisition, care, maintenance, and commitment to remediate the brownfield portions of the site as reflected in a prospective purchaser agreement with DEQ is premised on the continued viability of the Blue Heron Permit and consistent, legal treatment under the Clean Water Act. The Blue Heron Permit should be listed as an active permit and should receive a waste load allocation under the Willamette River Mercury TMDL the same as any other active discharger of this character.

We further note that the TMDL document lists the West Linn Paper Company permit as not operating, but published reports state that the mill is restarting and the permit would be active and discharges continuing. The current state of activity or not of a permit does not remove an obligation by DEQ to make a waste load allocation to that permit under the TMDL. Only after DEQ takes official action to terminate an NPDES permit may it not consider such permits and assign waste load allocations under a TMDL.

Response: DEQ added "Blue Heron (not operating)" to the list of existing permitted industrial sources, in the same category as "West Linn Paper (not operating)." Like all permits on the list, application of requirements related to the permitted wastewater sector-specific aggregated allocation will be considered during renewal of each permit.

G_G#11: Suggested Change ID #250

Description: WQMP - Revise requirements for smaller Phase I MS4 communities

Comment: Section 13.3.2.2.1 on page #117 ("MS4"):

This section says renewed Phase I MS4 permits will need to include a requirement for the collection of stormwater samples for total mercury. This language is too prescriptive and should be revised. Smaller Phase I MS4 communities, such as the City of Rivergrove (population 371) should be specifically exempted from this requirement in the final WQMP because the collection and analysis of samples for total mercury is very expensive, clearly exceeding the Maximum Extent Practicable (MEP) performance standard in MS4 Permits. This is a continuing problem arising from the inclusion of small communities in the lumped MS4 Phase I permits in Clackamas County.

Other proposed requirements for renewed Phase I MS4 permits are also listed here. For example, the draft WQMP specifies that a "mercury minimization section within the Stormwater Management strategy" shall be developed and submitted to DEQ. Did DEQ intend to say a mercury minimization section should be added to permit holders' Stormwater Management Plans (SWMP)? If so, we have extensive

experience with SWMPs, since WES and our partners, including Clackamas County and the cities of Rivergrove and Happy Valley, have held a Phase I MS4 permit since 1995. We believe it would be counter-productive to add a complete new, unnecessary, and almost certainly unwieldy section to our SWMPs. We believe a better approach for accomplishing this objective would be to generate a written review our MS4 Permit SWMP's BMPs (Best Management Practices) to confirm that we're continuing to reduce mercury in our MS4's discharges to the Maximum Extent Practicable (MEP). This written review would be submitted to DEQ, and if gaps are identified, potential solutions include: I) insertion of one or more new BMPs in an updated SWMP, or II) one or more existing BMPs could be proposed for revision in an updated SWMP.

And finally, while we believe it is appropriate for the WQMP to suggest some general items for the DEQ's MS4 Permit writer to consider when the renewed Phase I MS4 Permit is written, the placement of specific future MS4 Permit requirements in the WQMP is inappropriate.

Response: Thank you for you input. As with other TMDLs, not every municipality will be required to collect every type of data under Schedule B of the renewed Phase I MS4 permits. In the Clackamas Group's 2012 permit, the responsibilities of Rivergrove were tied to those of SWMACC, now a part of WES, and the monitoring requirements for Johnson City, another small municipality, were separately tailored to their capacity. During the Phase I MS4 permit development process, DEQ will continue to ensure that monitoring requirements appropriately account for the capabilities of the individual regulated MS4 entities.

DEQ revised the language regarding mercury minimization plan submittal in the MS4 Phase I requirements for clarity.

DEQ retained the level of specificity on permit requirements in the WQMP. In support of Reasonable Assurance and the Accountability Framework described in Section 14 of the TMDL, it is imperative to be clear and transparent regarding requirements and expectations for each permittee, DMA and Responsible Person for the implementation of this TMDL.

G_G#12: Suggested Change ID #251

Description: WQMP - Urban vs. Rural Streams

Comment: Section 13.3.1.11 Local Government: Urban vs Rural Streams:

In the TMDL, it is important to be clear and consistent when using the terms urban and rural to describe streams and runoff. The draft WQMP incorrectly refers to "urban streams" when it is focused on a discussion of rural areas. And rural stormwater runoff is consistently and incorrectly referred to as urban runoff, and assumed to be of similar quality when data and published reports indicate otherwise.

Response: DEQ agrees that it is important to be consistent with references to urban and rural stormwater runoff in the WQMP and has revised the WQMP accordingly.

G_G#13: Suggested Change ID #252

Description: Editorial - Table 1-3

Comment: Table 1-3 on page #20 ("Land Use Areas…"):

This table contains a mixture of land uses and land cover (i.e. shrub land), yet the table's title includes the term "Land Use". If the title is retained, please remove land cover types, such as shrub land, and add land uses which were missed, such as "Rural Residential". Another option is to change the name of the table to "Land Cover" or a similar term. It is unclear what the intention of this section is as written.

Response: The differences between land use and land cover, along with the aggregated categories used in the TMDL are discussed in Section 1.2.2.

G_G#14: Suggested Change ID #253

Description: Editorial - Table 6-7 clarification

Comment: Table 6-7 on page #42 ("Estimate total mercury loads for source categories…"):

The "Point Sources" portion of the table includes a row for the estimated total load of mercury from NPDES-permitted MS4s. If the data in this row also includes the estimated total load of mercury from facilities and properties with the other types of stormwater discharge permits (such 1200-Z, 1200-A, and 1200-C), then please clearly state this fact here, or include the loads for these other types of permits on separate rows in the table. Note: On page #58, the TMDL says the modeled mercury load from all types of stormwater permits were combined into a single category. Therefore our assumption is that this section is incomplete.

Response: DEQ changed the source category to read "Permitted Stormwater discharges," removing the parenthetical reference to MS4.

G_G#15: Suggested Change ID #254

Description: Editorial - Table 9-5

Comment: Table 9-5 on page #58 ("Summary of MS4 Permits"):

In the portion of this table which is devoted to the Clackamas County MS4 permit, CCSD#1 and the SWMACC are included as copermittees. Please remove SWMACC and CCSD#1 the replace them with Water Environment Services as the single permit holder, per our permit transfer notices filed in 2017 and 2018, respectively.

Response: DEQ made this change to Table 9-5.

G_G#16: Suggested Change ID #255

Description: Allocations - Table 10-1 general stormwater permit loads clarification

Comment: Table 10-1 on page #62 ("Allocations"):

Similar to Table 6-7, the table includes a row for "NPDES MS4 Stormwater Point Source Discharges". If the data in this row also includes the estimated total load of mercury from facilities and properties with the other types of stormwater discharge permits (such 1200-Z, 1200-A, and 1200-C), please clearly state this fact here, or include the loads for these other types of permits on separate rows in the table. Note: On page #58, the TMDL says the modeled mercury load from all types of stormwater permits were combined into a single category. Therefore our assumption is that this section is incomplete.

Response: In contrast to the assertion in the comment, DEQ clarifies that the statement referenced on page 58 of the public notice draft TMDL does not state that 'the modeled mercury load from all types of stormwater permits were combined into a single category.' Rather, the statement refers to facts in the TMDL Technical Support Document explaining that the potential mercury contributions in stormwater managed through all of the general stormwater permits (NPDES 1200-A, 1200-Z 1200-C, 1200-CA and 1200-CN) were implicit within the modeled loads from MS4 stormwater runoff. In other words, the modeling did not estimate loads from general stormwater permits. The TMDL text on page 58 goes on to explain then, that the potential mercury loads from both MS4 permits and most general stormwater permits are addressed with assignment of point source wasteload allocations. DEQ did not add an additional footnote to Table 10-1, but revised the label for the source sector in Table 10-1 and throughout the TMDL to "NPDES Permitted Stormwater Point Source Discharges."

G_G#17: Suggested Change ID #256

Description: WQMP - WQ improvement - MS4 permit holders

Comment: Section 13.3.1.4 on page #82 ("Oregon Department of Agriculture"):

In the section titled "Regulatory Implementation through Agricultural Water Quality Management Area Rules", Strategic Implementation Areas (SIA) are portrayed as being "…a proactive approach to identifying specific agricultural activities in a specific watershed that are violating ODA rules, as well as legacy conditions that are adversely affecting water quality, and identifying conservation actions that will help achieve water quality goals". We believe the establishment of SIAs in 2014 was prudent. But the total acreage contained within all of the SIAs in the Willamette River's watershed is small compared to the total acreage of all agricultural lands in the watershed. What is the State of Oregon's plan for implementing a proactive regulatory approach for water quality improvement on the other agricultural lands in the Willamette River's watershed? Please also confirm that MS4 permit holders will not be assigned this responsibility, as it should be the State of Oregon which is the default designated management agency for this area.

Response: DEQ agrees that SIAs continue to be a prudent approach for addressing water quality impacts from agricultural practices. DEQ also agrees that the SIA program is limited in scope, however ODA will increase the number of SIAs they initiate every year beginning in 2020 and are also looking for funding that can be used to grow the SIA program and its impact. The WQMP was revised to acknowledge ODA's recent efforts to expand the SIA program.

MS4 permittees are responsible for implementing the TMDL as described in the TMDL WQMP.

G_G#18: Suggested Change ID #257

Description: Editorial - 2006 Willamette TMDL WQMP

Comment: Section 13.3 on page #78 ("Proposed Management Strategies…"):

On page #78 in the WQMP, DEQ mentions the 2006 Willamette TMDL WQMP for the first time in the updated mercury WQMP. We believe the updated mercury WQMP should mention the existing 2006 WQMP on its first page (page #73). In addition, the 2006 Willamette TMDL WQMP applies to several pollutants, so it will still be in effect for E. coli, water temperature, etc. even after the new mercury WQMP is in effect. The "public comment draft" mercury WQMP appears to fail to explain to the reader that the 2006 WQMP will continue to be in effect for these other pollutants; this omission should be rectified to avoid confusion.

Response: DEQ agrees with this suggestion and added descriptive language at the beginning of the WQMP that briefly describes that the 2019 TMDL updates the 2006 TMDL requirements. The WQMP requirements for other Willamette Basin TMDL pollutants established in 2006 remain effective.

G_G#19: Suggested Change ID #258

Description: WQMP - NPS - management of private property discharges

Comment: Section 13.3.1.11.1 on page #96 ("Nonpoint Source Stormwater Management Requirements for MS4 Permit Holders"):

We have one more comment about this section of the TMDL. WES and our partners provide stormwater management services in WES' retail urban service area. A portion of this area drains to drywells we own/operate and these areas are regulated by a DEQ issued Stormwater WPCF (Water Pollution Control Facilities) permit. Other portions of this area drain into the surface-discharging storm sewer system we own/operate (the MS4) and these areas are regulated by the DEQ-issued MS4 permit. But the remaining portion of this area isn't served by any storm sewer system we own or operate; in these geographic areas, we have little or no authority to control discharges from private property into creeks, wetlands or rivers, or into privately owned injection devices, such as drywells. Note that much of our existing authority is derived from the storm sewer systems we own and/or operate. We believe the TMDL should be revised to clearly state that the State of Oregon will continue to be legally responsible for regulating those discharges which flow straight to a surface water body from private property.

The TMDL says our TMDL Implementation Plan "…must include management strategies to reduce runoff and erosion that discharge directly to waterbodies." This sentence should be revised to state that DMAs are encouraged to voluntarily implement management strategies to reduce runoff and erosion that discharge directly to waterbodies. In these instances, we continue to be willing and able to provide education and technical assistance consistent with our jurisdictional boundaries, and we'll continue to refer property/business owners to DEQ or another state agency as directed when the services we offer aren't able to be sufficiently protective of surface water quality.

Response: Based on public comment, DEQ modified requirements for counties. Counties are unique in terms of land use and pollutant sources because they have a mix of both densely populated urban areas and sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned

lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns expressed by WES.

One of the core management programs that counties must implement is enforcement of prohibited pollutants. Counties must implement a program to reduce conveyance of mercury and mercury-related pollutants to waterbodies from county lands and properties, and must have authority to take enforcement action against entities contributing mercury-related pollutants, such as sediment, to county property and assets, such as roads. The enforcement program must prohibit mercury-related pollutants from discharging to waters of the state through enforcement of an ordinance or other legal mechanism, including appropriate enforcement procedures and actions to ensure compliance. DEQ recognizes that existing county ordinances or those to be adopted could likely be more comprehensive and prohibit discharges of other pollutants, rather than only those pollutants associated with mercury.

DEQ supports enforcement capability as an important tool in preventing future pollution. While DEQ continues to have authority to address discharges to waters of the state, cities and counties also have authority to control land uses within their jurisdiction that have the potential to negatively impact water quality, particularly in circumstances where discharge of pollutants affect county properties. DEQ appreciates WES's willingness to continue to also provide education and technical assistance to property owners.

DEQ added language to this section in the WQMP to confirm that DEQ will continue to have authority to address discharges to waters of the state, but that cities and counties also have that authority.

G_G#20: Suggested Change ID #259

Description: Editorial - Table 13-12 add protection of riparian areas

Comment: Table 13-12 on page #101:

This table lists examples of the U.S. Bureau of Land Management's BMPs. This table doesn't have a BMP for the protection of – or for the minimization of adverse impact to – riparian areas, but we believe it would be appropriate to include one. The U.S. Forest Service's table has a BMP which says: "…prescribe adequate no-harvest buffers on both perennial and intermittent streams within treatment areas". In the Willamette River's watershed, the BLM's land is typically forested, so the inclusion of a similar riparian area BMP for timber land management-related activity would be prudent.

Response: DEQ agrees that riparian protection and enhancement are important strategies that address multiple pollutants, including mercury and sediment. DEQ revised Table 13-12 to include BLMs Riparian Reserve management requirements.

G_G#21: Suggested Change ID #260

Description: Reserve Capacity - describe how reserve capacity would be available with sector specific percent reduction allocations

Comment: Section 12 on page #72 ("Reserve Capacity"): Reserve capacity is an allocation for potential increases in mercury loads from new or expanded sources. This section says reserve capacity may be

granted to NPDES permitted point sources and/or nonpoint source designated management agencies and responsible parties. It is not stated how the reserve capacity would be made available for new or expanded sources in a TMDL that includes sector-specific percent reduction allocations. Clarify how the reserve capacity would be made available for new or expanded sources in a TMDL, including sector-specific percent reduction allocations. Please also confirm that the groundwater comment provided above will not be determined as utilizing the entirety of the reserve capacity.

Response: In response to other comments, DEQ removed nonpoint sources for consideration for reserve capacity. This is because all potential nonpoint sources of mercury were captured through the land use evaluation process and, though ownership or land activities may change, no new nonpoint source areas are anticipated to be identified. As explained in Section 12 of the TMDL, DEQ will require demonstration of effluent condition and implementation of DEQ approved mercury minimization measures prior to a determination on allocating a portion of the 1% reserve capacity. This evaluation will occur prior to or during the permit application process for any new point sources or during the permit modification or renewal process for any expansions of existing permitted facilities. DEQ clarifies that reserve capacity is an additional 1% of the relative allocation of load capacity by sector (as shown in Table 10-1), from which portions can be allocated in addition to the sector specific percent reduction allocations.

G_G#22: Suggested Change ID #261

Description: WQMP - Air Emissions Mercury Reductions

Comment: Section 13.3.3.1 on page #118 ("Other DEQ Mercury Reduction Programs…"):

The section in the draft WQMP titled "Air Emissions Mercury Reductions" is very short – only one sentence – although four paragraphs about air emissions are provided in section 9.1 of the TMDL, and a list of stationary sources of mercury discharged into the air is found in Appendix G. Since "…atmospheric deposition is the major source of mercury" to the river (see page #116), more information should be provided in the WQMP to describe the work DEQ is and will be doing to reduce the amount of mercury which is discharged into the air from sources within Oregon.

Response: DEQ did not make this requested change. As noted in Section 10.2 of the TMDL, the TMDL Technical Support Document found that deposition of mercury onto the Oregon landscape is the dominant source of mercury reaching Willamette Basin streams and that while these deposited air emissions originate as a mix of global, national, regional and local sources, the largest portion is derived from historical deposition of global anthropogenic mercury emissions (TetraTech, 2019). While the percentage of air deposition from within the Willamette Basin cannot currently be quantified, potential air emission sources have been identified. DEQ reviewed mercury air emissions sources and quantifications from other states' TMDLs, particularly in the densely developed northeastern US, and found the types of facilities (coal burning power generation, medical and other waste incinerators) responsible for significant mercury emissions loads in those areas do not occur in the Willamette Basin. Thus, DEQ's brief description of focus on the three facilities in the basin know to emit more than 1 kg/yr of mercury is appropriate.

G_G#23: Suggested Change ID #262

Description: General - State Legislation on Mercury in Products

Comment: Section 13.3.3.1 on page #119 ("State Legislation on Mercury in Products"):

This section in the draft WQMP provides a list of successful historic mercury reduction legislation, including the requirement in 2007 for dental offices to install dental amalgam separators to reduce their discharge of mercury into sanitary sewer systems and septic systems. Unfortunately, mercury can still be found in some of the products which are purchased today by businesses and residents in Oregon (in certain foods or drinks, for example. When mercury is found in food and drink, it is a contaminant or impurity). To continue with the food and drink example, in the future, if these products contained less mercury, or no mercury at all, we'd expect to see a reduced amount of mercury being discharged into sanitary sewer systems from sinks, toilets, and dishwashing machines. Has the State of Oregon considered any additional uses of its existing administrative and/or legislative authority to set allowable amounts of mercury in selected products – including food and drinks – purchased by businesses and residents in Oregon? The prudent use of this existing authority would eventually translate into cost effective, substantial reductions of mercury in the Willamette River's fish. We are hoping for some assurance that the State will not consider its part in mercury reduction ended with the adoption of this TMDL.

Response: DEQ agrees that reducing mercury inputs to the Willamette Basin from all sources will benefit water quality. While DEQ does not have the authority to regulate food, beverage and other commercial products, DEQ will continue to provide free mercury pick-up services for eligible quantities. For more information, visit DEQ's Hazardous Waste program webpage at https://www.oregon.gov/deq/Hazards-and-Cleanup/hw/Pages/Mercury-Disposal.aspx.

G_G#24: Suggested Change ID #263

Description: WQMP - 1200-Z Permit Clarification

Comment: Section 13.3.2.2.2 on page #118 ("Stormwater General Permits…"):

1200-Z permits are addressed in this section. At the present time, 1200-Z permit holders in the Willamette River watershed must monitor their stormwater for mercury two times per year, since it is an "impairment pollutant". Impairment pollutants apply to discharges to an impaired water without a TMDL for the pollutant. After the mercury TMDL has been finalized, will 1200-Z permit holders be allowed to discontinue mercury monitoring of their stormwater? If a larger and ongoing set of mercury data from industrial facilities will be valuable, we encourage the DEQ to continue to require 1200-Z permit holders to monitor their stormwater for mercury after the TMDL has been issued and approved.

Also, since 1200-Z permitted facilities in the Willamette River's watershed have been monitoring their stormwater for the presence of total mercury, we have this question: Was this set of data used to inform the development of this draft mercury TMDL?

Response: DEQ clarifies that the currently issued 1200-Z permit also requires mercury monitoring for certain sectors, regardless of receiving waterbody status, and determines impairment parameter monitoring on a stream by stream basis using the 303(d) list effective as of May 1, 2017. Data will continue to be collected by permit registrants as required and evaluated as part of the TMDL Monitoring and Evaluation Strategy. DEQ evaluated the data collected by 1200-Z permit registrants during development of the 2019 Willamette Basin Mercury TMDL.

G_G#25: Suggested Change ID #264

Description: Editorial - 13.4.1 rewording

Comment: Section 13.4.1 on page #121 ("Nonpoint Source DMAs…"):

The section says "Each nonpoint source DMA and responsible person will submit a TMDL implementation plan that includes…". This section should be re-worded to acknowledge that many DMAs will be submitting a revised TMDL implementation plan, not a new plan, in response to the revised mercury TMDL. We, and many other DMAs in the Willamette river watershed, have been implementing DEQ-approved mercury TMDL implementation plans for more than ten years.

Response: DEQ added language to this section specifying that new or updated TMDL implementation plans will be submitted to DEQ. DEQ acknowledges that many DMAs have been implementing mercury reduction actions since 2006; however, it is very likely that DMAs will need to revise existing TMDL implementation plans based on this updated WQMP.

G_G#26: Suggested Change ID #265

Description: WQMP - PS - Editorial - Section renaming

Comment: Section 13.4.2 on page #122 ("Point Sources"):

The title of this section should be changed, since much of the content in this section's Table 13-20 pertains to non-point sources of water pollution.

Response: DEQ clarifies that Table 13-20 is relevant to the whole of Section 13.4 and not specific to Section 13.4.2 as implied in the comment. DEQ moved the table up to the end of Section 13.4, to prevent confusion.

G_G#27: Suggested Change ID #266

Description: Editorial - Appendix E

Comment: Appendix E includes a list of Designated Management Agencies (DMA) and responsible persons. Although Clackamas County is on this list, Water Environment Services, which is the ORS 190 municipal partnership which recently assumed the responsibilities and permits of Clackamas County Service District No. 1 and the Surface Water Management Agency of Clackamas County – is not. Please add Water Environment Services to the list of DMAs in Appendix E and remove, if necessary, CCSD#1 and SWMACC.

Also in Appendix E, the location of the "Columbia County Drainage District #1" is said to be in Clackamas County. Please provide the correct location for this district.

Response: DEQ thanks the commenter for those corrections. In response, DEQ added Water Environment Services to the Appendix E list of DMAs. At DEQ's request, WES provided a description of their agency for inclusion in the Special Districts section of the WQMP. Neither Clackamas County

Service District No. 1, nor the Surface Water Management Agency of Clackamas County were on the list of DMAs in Appendix E.

DEQ corrected the location of the Columbia County Drainage District #1 to be in Columbia County.

G_G#28: Suggested Change ID #267

Description: General - Water Quality Trading

Comment: Water quality trading.

If a cost-effective trading opportunity is identified by a NPDES permit holder, would the DEQ's rules/policy allow the trade to be approved? Removal of mercury-rich sediments from a creek or river downstream from an old, abandoned mine could be an example of a cost-effective trading opportunity, as would be inter-permit trading to optimize investments in such work. If yes, please so state. If no, does DEQ plan to revise this rule or policy to allow mercury trading in the future?

Response: The TMDL does not include a discussion of water quality trading as a permit implementation tool in Section 13.3.2.1.3 because DEQ's water quality trading rules, in OAR 340-039-0015, currently prohibit trading to address water quality impairments by toxic substances. DEQ does not currently have plans to make the requested revision to the water quality trading rules. In addition, the 10% reduction of mercury loads is allocated across the wastewater permit sector in aggregate and will be implemented as narrative water quality-based effluent limits in applicable permits. As such, conditions would not be conducive to quantification at an individual facility level for water quality trading.

G_G#29: Suggested Change ID #268

Description: Editorial - Table 5-9 - Kellogg Creek data

Comment: Table 5-9 on page #89 contains outdated, or possibly incorrect, total mercury concentration data for WES' Kellogg Creek Water Resource Recovery Facility (Kellogg Creek WRRF) and Tri-City Water Pollution Control Plant (Tri-City WPCP). Note that incorrect names for these facilities are used in this table; see comment below. Table 5-9's average total mercury concentration for the Kellogg Creek WRRF is 6.2 ng/L, but since Feb. 2015, this facility's average total mercury concentration has actually been much lower: 2.7 ng/L. And table 5-9's average total mercury concentration for the Tri-City WPCP is 5.9 ng/L, but the facility's average total mercury concentration has also actually been much lower since Feb. 2015: 2.6 ng/L. Please include this most recent data when fine-tuning the draft TMDL prior to its issuance.

In table 5-9 on page #89, incorrect names for the WES' Kellogg Creek WRRF (referred to as "Clackamas County Service District #1" in the table) and WES' Tri-City WPCP (referred to as "Tri-City Service District" in the table) are provided. Please provide the correct names for this facilities in the updated table.

Response: This comment is in regard to the TMDL Technical Support Document, not the TMDL and WQMP. DEQ compiled data and ownership information received from facilities, which were then applied in the quantification of existing mercury loads for permitted facilities. No changes were made to the

TMDL Technical Support Document. Ownership as of 2019 is reflected in the TMDL. DEQ acknowledges that facilities have differing levels of maturity of mercury minimization programs and some facilities that have applied strategies to reduce mercury loads from those represented in the TMDL assessment. DEQ did not compile more recent data and fine tune the modeling since publication of the draft TMDL. However, as noted in Section 14.1.6 of the TMDL, DEQ intends to revisit the watershed modeling with data collected since development of the loading assessment described in the TMDL Technical Support Document.

G_G#30: Suggested Change ID #269

Description: Editorial - Table 5-8 - update incorrect information

Comment: In table 5-8 on page #87, incorrect ownership of WES' Kellogg Creek WRRF and WES' Tri-City WPCP is provided. The previous owners – Clackamas County Service District No. 1 and the Tri-City Service District – are listed in this table. The current owner of both facilities is Water Environment Services.

Also in table 5-8 on page #87, the row for WES' Tri-City WPCP includes an incorrect HUC 8 waterbody. Although this facility is located in the Clackamas River watershed, treated effluent from the Tri-City WPCP is discharged directly into the Willamette River. Please correct this error.

Response: This comment is in regard to the TMDL Technical Support Document, not the TMDL and WQMP. No changes were made to the TMDL Technical Support Document. Ownership information was supplied by DEQ to support the development of the TMDL Technical Support Document and quantification of existing mercury loads for point sources. Ownership as of 2019 is reflected in the TMDL. Information regarding subsequent changes in ownership, facility name, activity status, etc., are to be presented and discussed in TMDL Implementation Plans.

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54. Comments from: Folliard, Lee of Oregon/Washington Bureau of Land Management

F_L#1: Suggested Change ID #318

Description: General - Resource Management Plan is sufficient to protect water resources

Comment: The BLM administers public lands in the Willamette Basin for multiple uses, including timber production, recreation, mining, and habitat management. The Resource Management Plans for Western Oregon (2016) incorporated new science, policies, and technology to protect water resources. Our rigorous environmental planning process incorporates into the design of every action measures that avoid or mitigate pollutants from entering the waters of the State of Oregon. The BLM implements a suite of site-specific and action-specific best management practices with each action to protect water resources.

The BLM follows established processes to monitor project implementation and the efficacy of our protections to ensure all actions are implemented to the designed standards. The measures that the BLM takes for actions planned under the Resource Management Plans for Western Oregon (2016) greatly reduces the probability of sediment delivery to streams.

Response: DEQ agrees that DMAs, including BLM, currently implement water quality programs and best management practices that are protective of water quality. DEQ believes that requiring DMAs to develop and submit measurable objectives and milestones related to the implementation of this TMDL will result in additional water quality benefits.

F_L#2: Suggested Change ID #319

Description: Modeling - Connection between BLM management actions and methylmercury fish tissue concentrations is not clear

Comment: The BLM supports actions that improve water quality and reduce mercury in fish tissue. In general, the BLM supports this Water Quality Management Plan, however we have concerns about the additive assumptions used in the analyses and the subsequent uncertainty from which conclusions are drawn. Mercury methylation is a product of complex processes that move and transform mercury in the environment. Most of the mercury in the Willamette Basin's forested landscape is derived from air deposition. Tetra-tech's mass balance, mercury translator, and food web models do little to characterize exactly how and where inorganic mercury is methylated and the pathways for bioaccumulation. The connection between BLM management actions and methylmercury fish tissue concentrations is not clear from the modeling effort that serves as the foundation for the load allocations in this document.

Response: DEQ considers the use of the mass balance model sufficient to represent the fate and transport of mercury at the HUC08 spatial and multiple year time scales and to estimate percent reduction for the load allocations. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

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55. Comments from: Darnell, Karen of StreamSavers

D_K#1: Suggested Change ID #375

Description: WLA - 700PM - do not prohibit suction dredge mining and conduct a mercury remediation via suction dredge study

Comment: We respectfully oppose the banning of any dredge activity in mercury laden streams at this time and ask that a "mercury remediation via suction dredge" study be commissioned in the Bohemia District.

Response: While DEQ supports efforts to conduct additional studies on suction mining techniques to prevent mobilization and methylation of mercury in streams where it is present, DEQ does not have

funding or resources planned for further study at this time. DEQ concludes that the studies referenced in the TMDL provide ample information that, when mercury is present in stream sediment, suction mining mobilizes mercury and allows for methylation. Until methods are developed and demonstrated to prevent mercury mobilization and methylation following suction dredge mining, prohibition of this activity in streams with known mercury contamination is needed to reduce mercury distribution in the Willamette Basin.

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56. Comments from: Nagely, Meredith of Associated Oregon Hazelnut Industries

N_M#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

N_M#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances,

this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

N_M#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

N_M#4: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

N_M#5: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

N_M#6: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

N_M#7: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from

different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

N_M#8: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. The uncertainty in the models is generally discussed with respect to the margin of safety in section 11 of the TMDL. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

N_M#9: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to gaged flows, the modelers reported that "Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows"; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading. DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

N_M#10: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is “estimated to be 361 g/day”, a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value “351.42 g/day” for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

N_M#11: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

N_M#12: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

N_M#13: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each separately. -Providing examples in which "sites", which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

N_M#14: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including "sites" as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A "random effect" is a statistical term for describing a site specific effect on the value of a variable. The term "fixed" effect refers to how the value of a variable changes according changes in the value of another variable. In the case of the TSS surrogate analysis, the "random effect" is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

N_M#15: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because the it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

N_M#16: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate "to estimate allocations for pollutants addressed in the TMDL". However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be "used for evaluating effectiveness of the TMDL" because monitoring of "total mercury can be difficult and cost-prohibitive". This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

N_M#17: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

N_M#18: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

N_M#19: Suggested Change ID #312

Description: Modeling - LA modeling is based on uncertainty

Comment: Load allocation modeling is based on uncertainty. Mercury wasteload allocations are based on six separate and contested computer models, each with accompanying uncertainties. Additionally, the 'mass balance model' has compounded uncertainties because it utilizes two models' outputs as the inputs. This layering of uncertain modeling injects significant uncertainty into the load allocations.

Response: Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

N_M#20: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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57. Comments from: Smith, Susan of Oregon Association of Clean Water Agencies (ACWA)

S_SO#1: Suggested Change ID #119

Description: WQMP - Stormwater Minimum Control Measures - align with EPA guidance and allow flexibility

Comment: Recommendations- Section 9.4.2.3 Minimum Control Measures - rules need to be aligned with EPA guidance - allow flexibility. The proposed general and prescriptive standards require counties to expend funds inefficiently and with negligible benefit to water quality. DEQ needs to realign the proposed rules with the guidance provided by the EPA which allows local governments to create their own implementation strategy for the Six Minimum Control Measures. The proposed Six Minimum Control Measures do not align with federal requirements and require new enforcement strategies in rural areas that typically reside in DEQ and are more strict than urban areas. Each layer adds administrative cost and requires reporting on outcomes that are difficult to measure and have high compliance standards. Implementing minimum control measures that were designed to improve water quality in urban areas to rural and geographically isolated areas will not fit the needs of those regions. However, if counties and local governments are empowered to tailor construction erosion, post-construction and illicit discharge programs to fit the needs of the broader communities we serve, we feel we could be much more successful in reducing impacts of erosion and mercury loads.

Additionally, the specificity included in the six minimum measures with regards to construction stormwater requirements, post construction requirements, and design standards does not enable smaller cities and counties to develop a program that reflects their local capabilities and needs. For example, overseeing activities such as the construction and maintenance of stormwater facilities for individual lots that may require county staff to travel as far as 100 miles one way is not practicable or cost-effective. In addition, the post-construction program could lead to inconsistencies if it results in developers having to build stormwater facilities in rural areas adjacent to cities where similar standards are absent if the city population is less than 5,000. These requirements could significantly raise the cost of roadway projects in rural areas, that are primarily served by drainage ditches, as tight rights-of-way would lead to a need to purchase adjacent agricultural land to construct water quality treatment and flow control facilities. Further, for counties with hundreds of miles of ditch networks in the rural areas outside of the urban growth boundary, the requirement for a stormwater map and digital inventory of the drainage system will be a costly and impracticable effort. We recommend that the minimum measures be tailored to the rural, expansive, and isolated nature of these lands, and listed as a suite of options that are available for smaller cities and counties to consider in developing their programs. Individual jurisdictions can then evaluate the options and develop a practicable program that reflects their jurisdictional responsibilities and capabilities that are both consistent with the character and usage of the areas under consideration and will provide true benefits to water quality.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned

lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. The stormwater control measures described in Table 13-10 are generally less prescriptive than the requirements contained in DEQ's MS4 Phase II general permit, yet will provide a standard set of practices many cities will implement across the Willamette Basin to help reach the 75% total mercury reduction from urban stormwater.

S_SO#2: Suggested Change ID #120

Description: Allocations - Table 10-1 - source sector clarifications needed

Comment: Allocation Table (Section 10, Table 10-1, p62)

Please clarify information in Table 10-1, particularly regarding source sectors and associated allocations. Some sectors are repeated with conflicting allocations, making it difficult to understand how each sector is defined and what the requirements are. For example, Non-Permitted Urban Stormwater is included both as its own sector and with the "general nonpoint source" sector with allocations of 75% and 88% reductions, respectively.

This should be revised to reflect the 75% reduction being sought from this sector. Similarly, atmospheric deposition is specified as both an 88% reduction and an 11% reduction.

Page 62. Table10-1 is confusing because it indicates general nonpoint source and background captures non-permitted urban stormwater and atmospheric deposition, then lists these two sources separately. While they are unified for existing loads, they are listed separately for allocations. This could be displayed more clearly by displaying the source sectors as below or you could add notes to the 75% and 11% required reductions. (EPA comment #15)

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. For clarity, particularly with regard to implementation, DEQ used different terminology for labeling source categories in the TMDL and WQMP than was used for labeling source categories in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. No sector is assigned more than one allocation, as summarized in the revised Table 10-1.

S_SO#3: Suggested Change ID #125

Description: WQMP - MS4 effectiveness evaluation

Comment: MS4 Phase I Requirements (Section 13.3.2.2.1, p117) In the second sub-bullet, please remove the term "monitoring" and replace with "evaluation" to allow both qualitative and quantitative methods for evaluating control measure effectiveness.

The second sub-bullet, beginning, "An effectiveness monitoring strategy…" should instead require a strategy for evaluating the effectiveness of control measures. The use of the term "monitoring" could be interpreted to require only water quality monitoring, which is not necessary the most effective way to evaluate the effectiveness of control measures, which are predominantly Best Management Practices. Requiring evaluation of effectiveness allows more flexibility across the range of control measures.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language.

S_SO#4: Suggested Change ID #163

Description: Editorial - Load allocations for nonpoint sources

Comment: Section 10.1 page 65. Text references "the 10 percent reduction for atmospheric sources" in the middle of the first paragraph; however, the allocations show an 11 percent reduction to provide a 1 percent reserve capacity.

Response: DEQ agrees and has made this change.

S_SO#5: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in

fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

S_SO#6: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ

document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

S_SO#7: Suggested Change ID #237

Description: Allocations - General text revision

Comment: Section 10, Allocations: On page 61 of the TMDL, the next-to-last sentence of the first paragraph states, "The waste load allocations are used to establish effluent limits in discharge permits." Since the TMDL is not suggesting inclusion of numeric effluent limits in permits but rather narrative management practices to implement the wasteload allocations, this sentence should be revised to state that "the implementation strategy associated with the wasteload allocations is incorporated into discharge permits."

Response: DEQ did not make changes to the statement: "The waste load allocations are used to establish effluent limits in discharge permits." While it is true that DEQ is not establishing numeric effluent limits in wastewater permits, once the TMDL is acted on by EPA, DEQ will implement narrative water quality-based effluent limits in permits that are consistent with the assumptions and requirements of the wasteload allocation for the discharge prepared by the State and approved by EPA. This is consistent with the Code of Federal Regulations, EPA guidance and precedent on multiple other states.

S_SO#8: Suggested Change ID #238

Description: Allocations - Table 10-1 PS clarification

Comment: Table 10-1 allocates a 10 percent reduction to NPDES Wastewater Point Source Discharges, but the TMDL applies this reduction only to major municipal NPDES discharges and excludes minor municipal facilities as de minimis and not subject to the 10 percent reduction. Table 10-1 should be explicit that only major municipal NPDES discharges are subject to the 10 percent reduction allocation. It would be helpful to be explicit on permit expectations (even if none) for de minimis sources to limit future confusion related to permit conditions. Also, any clarification of how the reduction would apply if a minor source becomes a major source due to growth or pretreatment would be helpful. Provide a note in Table 10-1 that clarifies the 10% NPDES wastewater point source discharges reduction applies to major municipal NPDES wastewater discharges only because minor municipal facilities are considered de minimis in other sections and not subject to the 10% reduction.

Response: DEQ did not make the requested changes to Table 10-1. The table correctly identifies the sector-specific allocation of a 10% reduction that is aggregated across all permitted wastewater discharges. Section 10.2 further specifies the permits covered under this sector and explains DEQ's rationale for aggregating the allocations, as allowed under the Clean Water Act (per 40 CFR 130.2(i)) and supported in multiple guidance documents and by precedent in multiple approved TMDLs from other states. Section 10.2 goes on to give a brief overview of the wasteload allocation implementation approach and notes that implementation details are specified in the Water Quality Management Plan, which is found in Section 13 of the TMDL. Section 13.3.2.1.1 provides the explicit information regarding permit requirements by permit type, as requested in the comment. DEQ determined that the WQMP is the appropriate location for such implementation details. Finally, as noted in Sections 13.6 and 14 of the TMDL, DEQ will monitor and evaluate progress toward the goal of attaining mercury water quality standards and intends to adaptively manage progress in attaining those goals, which can over time entail application of additional requirements within sectors, as warranted by evaluation results.

S_SO#9: Suggested Change ID #239

Description: Editorial - WQMP - WLAs will not be incorporated into permits but implemented by incorporating the management strategies identified in Section 13.3.2

Comment: Section 13.1.1, Implementation Plans: This section states that wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. Since the draft TMDL includes specific permit conditions that will be included in NPDES permits to implement the sector-specific wasteload allocations, this section should clearly state that the wasteload allocations will be implemented by incorporating the management strategies identified in Section 13.3.2. and not by including the sector-specific wasteload allocations from Table 10-1 into NPDES permits. Clearly state that the wasteload allocations will be implemented by incorporating the management strategies identified in Section 13.3.2

Response: DEQ agrees with the comment and revised the text of Section 13.1.1.

S_SO#10: Suggested Change ID #240

Description: WQMP - Six minimum measures not appropriate for rural areas

Comment: Section 13.3.1.11, Local Government: Cities and Counties. The District has an established working relationship with the City of Gaston (which is within the District's jurisdiction, but outside the MS4) and with Washington County (a co-implementer than also will be responsible for rural areas outside the MS4) that ensures successful cooperation to address water quality in the Tualatin basin. The comments below reflect the District's concern that the WQMP's highly prescriptive requirements will impact that relationship and divert local resources away from programs that have shown demonstrated success. The WQMP's requirement to implement the six minimum measures from the Phase II rule is not appropriate for sparsely populated regions outside of MS4 permitted areas, such as those in rural Washington County. Although much of Washington County and other counties in the basin are densely urban, the area outside the MS4 areas and outside the Urban Growth Boundaries and are distinctly rural, typified by dispersed population in agricultural and predominantly less developed areas. The six minimum measures were developed for urban areas; applying them outside MS4 permitted areas could appear to be an attempt to impose MS4 permit requirements on locations that are neither Phase I nor Phase II communities. A more tailored approach that provides the opportunity for the counties to develop control strategies better designed for the rural areas would be more effective than narrowly construed application of the six minimum control measures. Of particular concern is the specificity of the descriptions in Table 13-10 and the resource demands they will exert. This specificity does not reflect a consideration of local resources and needs, as required by the Maximum Extent Practicable (MEP) standard for municipal stormwater discharges. The MEP standard requires consideration of unique local conditions such as receiving waters, size of the community, fiscal resources, hydrology, geology, and capacity to perform operation and maintenance.

Rather than imposing these requirements on small communities and rural counties, the TMDL should describe the six minimum measures more generally and provide them as potential elements to be considered for inclusion in programs tailored to local needs and capabilities. General descriptions of the six minimum measures should not include thresholds (such as land disturbance area for construction site runoff control or post- construction) or treatment levels (such as TSS removal targets). Program elements such as mapping and inventorying hundreds of miles of roadside ditches as part of an Illicit Discharge Detection and Elimination program may not be a good use of resources. Clearly, should an illicit

discharge be identified as a source of mercury, it should be controlled. Similarly, regulation of waste materials at construction sites beyond that regulated by the 1200C permit should be left to the discretion of the local government in their development of a TMDL implementation plan dependent on the likely source of mercury.

This requirement is especially significant for large counties with broad geographic jurisdiction. Counties covering broad geographic areas will need to coordinate on the six minimum measures within the urban growth boundaries of multiple cities and towns with a range of existing programs (or no programs at all, currently). This presents practical implementation challenges that take time to work through. Also, implementation of the six minimum measures in counties with large geographic areas essentially imposes an urban stormwater management program on largely rurally zoned lands (e.g., rural residential, rural commercial/industrial, etc.). The six minimum measures that are the basis of the MS4 Phase II NPDES permitting program were originally written and intended for managing runoff from urbanized areas. The imposition of these measures in a rural context lacks scientific support and poses a significant risk of unintended consequences and counterproductive actions. We do not think it is appropriate to use the Mercury TMDL as a mechanism for obtaining what is essentially MS4 Phase II NPDES permit coverage watershed wide. Given the largely rural extent of these areas, and the range of actions required to implement the six minimum measures, significant time and resources would be necessary to develop and implement storm water programs for runoff from rural lands without significant impact on or benefits for water quality.

What is the purpose or benefit of extending urban based measures to a rural area? What non-point source would we need to identify? The make-up of Benton County is such that our small staffing levels would be stretched even further as we traverse the county implementing the measures that have very little, if any benefit.

Response: DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

S_SO#11: Suggested Change ID #243

Description: WQMP - Editorial - 13.3.2.1.3 remove permit implementation tools

Comment: 8. Section 13.3.2.1.3, Additional NPDES wastewater permit implementation tools: Since the WQMP does not recommend including effluent limits in NPDES discharge permits, this section on variances and intake credits is not relevant and could lead to confusion. DEQ should remove this section from the final WQMP.

Response: DEQ agrees with the comment and removed Section 13.3.2.1.3.

S_SO#12: Suggested Change ID #244

Description: WQMP - MS4 submittals - do not require multiple submittals of SWMP to address mercury

Comment: 9. Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System: This section requires the inclusion of specified terms in MS4 Phase I permits upon renewal to implement the TMDL. The first bullet requires a mercury minimization section within the "Stormwater Management strategy." Presumably this refers to the permittee's Stormwater Management Plan (SWMP), not a separate document. Given the comprehensive nature of SWMPs, a second, redundant document should not be required. This section should be clear that it refers to the SWMP.

Including new requirements to create a separate mercury plan/update of the existing Stormwater Management Plan outside of the typical permit renewal cycle is an inefficient use of already limited time for both MS4 and DEQ staff and serves no environmental benefit, as DEQ already has copies of our documents. We request that DEQ use the same permit renewal and reporting cycle required for the MS4 permit be utilized for any language updates needed to specifically satisfy the Mercury Water Quality Management Plan, as we do not see new or additional information that we have/can provide beyond what is extensively documented and reported to DEQ annually.

It's unclear if the "mercury minimization section" referenced here is intended to be a stand-alone submittal, part of an annual report, or a Stormwater Management Plan (SWMP) revision. The latter is inappropriate. A new SWMP is generally required upon re-issuance of the MS4 permit, so this provision as written would force permittees to revise their SWMPs within two years of having drafted an entirely new SWMP, which is a very resource-intensive process and technically constitutes a permit modification. The SWMP comprehensively addresses all pollutants associated with stormwater runoff (including and especially sediment), so creating a duplicative or obsolete section within the SWMP that repeats all the existing pollution reduction strategies simply is not useful. Please modify language in the first bullet as noted to clarify this as a stand-alone submittal along with, or as part of, the second annual report.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language in Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System.

S_SO#13: Suggested Change ID #248

Description: Loading Capacity - resurfacing groundwater over daily capacity

Comment: Section 7 on page #43 ("Loading capacity and excess load"): According to the draft TMDL, the river's loading capacity – the amount of mercury the river can receive and still meet water quality standards – is 42 grams/day of total mercury. In table 6-7, "resurfacing groundwater" (springs, for example) is estimated to contribute far more total mercury: 60.6 grams/day. If the estimated amount of mercury discharged by resurfacing groundwater is verified to be correct as additional data is collected in the future, and if the amount of mercury in resurfacing groundwater is naturally occurring, and not the result of human activity, then the river's loading capacity for total mercury will never be met simply due to discharges of mercury in resurfacing groundwater. This would be true even if every property owner, every DMA, and every point source discharger somehow reduce their discharge of mercury to zero. Even if everyone does their part to reduce/control mercury in the future, natural erosion of soils will contribute more mercury, and volcanic eruptions and forest fires will cause even more mercury to be discharged into the river. This apparent fact – that the river's loading capacity for total mercury will probably never be met no matter what the people of Oregon do – should be featured in a more prominent location in the TMDL, including but not limited to the Executive Summary on page #11. Oregonians should all be taking reasonable and cost-effective steps to reduce and control our discharges of mercury, since this will result in better public health and environmental outcomes. But before the TMDL is finalized, acknowledgement

of the river's loading capacity and the river's natural sources of mercury should be used by DEQ to set a more realistic, attainable goal in the TMDL for future mercury control and reduction in the watershed.

Currently, there is limited understanding of natural and anthropogenic mercury loads and therefore, the TMDL should be focused on realistic, attainable goals for mercury reduction. For transparency, this inability to attain the mercury loading capacity should be featured in a more prominent location in the TMDL, including in the Executive Summary on page 11 and in Section 14 regarding reasonable assurance.

Response: DEQ acknowledges that natural sources of mercury in the Willamette Basin are a significant portion of the overall loads entering the river system. However, DEQ's expectation is that all relevant management strategies will be applied to the controllable portions of each source toward achieving each responsible entity's portion of the aggregated reductions needed.

S_SO#14: Suggested Change ID #251

Description: WQMP - Urban vs. Rural Streams

Comment: Section 13.3.1.11 Local Government: Urban vs Rural Streams:

In the TMDL, it is important to be clear and consistent when using the terms urban and rural to describe streams and runoff. The draft WQMP incorrectly refers to "urban streams" when it is focused on a discussion of rural areas. And rural stormwater runoff is consistently and incorrectly referred to as urban runoff, and assumed to be of similar quality when data and published reports indicate otherwise.

Response: DEQ agrees that it is important to be consistent with references to urban and rural stormwater runoff in the WQMP and has revised the WQMP accordingly.

S_SO#15: Suggested Change ID #260

Description: Reserve Capacity - describe how reserve capacity would be available with sector specific percent reduction allocations

Comment: Section 12 on page #72 ("Reserve Capacity"): Reserve capacity is an allocation for potential increases in mercury loads from new or expanded sources. This section says reserve capacity may be granted to NPDES permitted point sources and/or nonpoint source designated management agencies and responsible parties. It is not stated how the reserve capacity would be made available for new or expanded sources in a TMDL that includes sector-specific percent reduction allocations. Clarify how the reserve capacity would be made available for new or expanded sources in a TMDL, including sector-specific percent reduction allocations. Please also confirm that the groundwater comment provided above will not be determined as utilizing the entirety of the reserve capacity.

Response: In response to other comments, DEQ removed nonpoint sources for consideration for reserve capacity. This is because all potential nonpoint sources of mercury were captured through the land use evaluation process and, though ownership or land activities may change, no new nonpoint source areas are anticipated to be identified. As explained in Section 12 of the TMDL, DEQ will require demonstration of effluent condition and implementation of DEQ approved mercury minimization measures prior to a

determination on allocating a portion of the 1% reserve capacity. This evaluation will occur prior to or during the permit application process for any new point sources or during the permit modification or renewal process for any expansions of existing permitted facilities. DEQ clarifies that reserve capacity is an additional 1% of the relative allocation of load capacity by sector (as shown in Table 10-1), from which portions can be allocated in addition to the sector specific percent reduction allocations.

S_SO#16: Suggested Change ID #261

Description: WQMP - Air Emissions Mercury Reductions

Comment: Section 13.3.3.1 on page #118 ("Other DEQ Mercury Reduction Programs…"):

The section in the draft WQMP titled "Air Emissions Mercury Reductions" is very short – only one sentence – although four paragraphs about air emissions are provided in section 9.1 of the TMDL, and a list of stationary sources of mercury discharged into the air is found in Appendix G. Since "…atmospheric deposition is the major source of mercury" to the river (see page #116), more information should be provided in the WQMP to describe the work DEQ is and will be doing to reduce the amount of mercury which is discharged into the air from sources within Oregon.

Response: DEQ did not make this requested change. As noted in Section 10.2 of the TMDL, the TMDL Technical Support Document found that deposition of mercury onto the Oregon landscape is the dominant source of mercury reaching Willamette Basin streams and that while these deposited air emissions originate as a mix of global, national, regional and local sources, the largest portion is derived from historical deposition of global anthropogenic mercury emissions (TetraTech, 2019). While the percentage of air deposition from within the Willamette Basin cannot currently be quantified, potential air emission sources have been identified. DEQ reviewed mercury air emissions sources and quantifications from other states' TMDLs, particularly in the densely developed northeastern US, and found the types of facilities (coal burning power generation, medical and other waste incinerators) responsible for significant mercury emissions loads in those areas do not occur in the Willamette Basin. Thus, DEQ's brief description of focus on the three facilities in the basin know to emit more than 1 kg/yr of mercury is appropriate.

S_SO#17: Suggested Change ID #282

Description: Allocations - Table 10-1 - math error - page 61

Comment: There is an error in the math of the fourth equation on page 63. 42.17 g/day — 0.42 g/day = 41.75 g/day not 41.58 g/day.

Response: Correction made in report. Change 41.58 to 41.75

S_SO#18: Suggested Change ID #285

Description: WQMP - Section 13.3.1.11.1 and Section 13.3.1.11.2 - Source Assessment Stormwater Permits and Mercury Loads Section 9.4.2

Comment: Add a statement to clarify that stormwater control measures do not apply to stormwater management areas covered by water pollution control facility (WPCF) permits such as those for underground injection controls (UICs).

Response: DEQ did not add the requested statement to Section 9.4.2 because both Sections 9.4.2 and 9.4.2.1 include qualifications that consideration of mercury loads in stormwater pertain to discharges to waterways. Because WPCF permits and UIC authorizations prohibit discharges to waterways, these cases are already disqualified with the existing language. DEQ added the clarification that measures are required for nonpoint source stormwater discharges "to waterways" in Sections 13.3.1.11.1 and 13.3.1.11.2.

S_SO#19: Suggested Change ID #289

Description: WQMP - Section 13.3.2.2.1 MS4 Phase II Permittees - responsible authority clarification

Comment: Clarify whether developing a control measure effectiveness monitoring strategy applies to entities that choose to implement a mercury minimization plan to meet TMDL requirements as opposed to Phase II jurisdictions covered under an individual permit. If it applies to the former, express it as a bulleted item along with the other required plan elements. Otherwise provide rationale that would make these jurisdictions in greater need of monitoring than a general MS4 Phase II permittee.

Response: DEQ corrected the typo of a missing bullet point to indicate that the requirement of a control measure effectiveness evaluation strategy would be applicable to MS4 Phase II entities upon renewal of an individual permit.

S_SO#20: Suggested Change ID #292

Description: WQMP - Section 13.6 Monitoring and Evaluation - General

Comment: Given their significant experience with monitoring and the potential for significant resource implications, ACWA requests the opportunity to be involved in development of the Assessment and Monitoring Strategy DEQ and EPA are currently developing to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin.

Response: DEQ is committed to public, stakeholder, and DMA engagement in the development of the Assessment and Monitoring Strategy and appreciates ACWA's involvement. DEQ is working with EPA in the development of a draft Assessment and Monitoring Strategy that DEQ will make available for comment and refinement with DMAs and other watershed stakeholders, including ACWA.

S_SO#21: Suggested Change ID #293

Description: Source Assessment - Section 9.4.1.1. Municipal Sewage Treatment Plant Permits - Table 9-3 - correction

Comment: The City of McMinnville's treatment facility discharges to the South Yamhill River not the Willamette River.

Response: DEQ corrected this error.

S_SO#22: Suggested Change ID #294

Description: Appendix A - Target Fish Species

Comment: Northern Pikeminnow is not an appropriate target fish species due to limited human consumption and establishes an unrealistic goal for the TMDL. Convey a more accurate picture of fish consumption considerations in the Willamette River basin by using a more widely consumed fish or an analogue fish. Equate the use of the Northern Pikeminnow in terms of the margin of safety factors that would otherwise be applied to the use of a salmonid or other widely consumed fish.

Response: The justification for using the Northern Pikeminnow is given in Section 11 of the TMDL document.

S_SO#23: Suggested Change ID #295

Description: Appendix A - Biomagnification Factors - Table 3-5 Correction

Comment: Values used for WRB Cumulative BMF are incorrectly listed as medians but are actually 95th percentile values as pulled from Table 3-3. This impacts Figure 3-7 as well. This relates to Table 6.2 and Figure 6.2 in the TMDL document as well. Were the median values or the 95th percentile values used in moving forward with the translator model? This has important implications in understanding the margin of safety.

Response: There was an editing error in Table 3-3 of the TSD: the values in the Median column are actually the 10th percentile values and the values in the 95%le column are actually the median values. The correct median values are shown in Table 3-5 and Figure 3-7 of the review draft. The error in the TSD table was carried forward into Table 6-2 in the TMDL, while Figure 6-2 in the TMDL is correct. The incorrect tables have been updated in the documents.

Note that the correct median BMFs were used to calculate the water column THg target concentrations via the Translator in Table 4-4 of the TSD and Table 6-4 of the TMDL, and subsequent TMDL calculations are not affected. However, the column for the lower 95% confidence levels in these two tables mistakenly repeat the median values and have also been updated.

Incorrect columns were also pasted into Table 3-4 of the TSD and have been updated.

S_SO#24: Suggested Change ID #297

Description: Appendix A - WWTP Flows - Table 5-9 (page 89)

Comment: Revise the table to use actual annual average flows rather than design flows to more appropriately estimate current loads because there can be a considerable difference between actual flows and design flows. 57.4 MGD was used to estimate mercury loads for Clean Water Services' Rock Creek treatment facility whereas actual flows are 32.4 MGD for 2018.

Revise the flow for the Salem facility and verify the accuracy of the annual average POTW flows presented in Table 5-9. Table shows 690 MG per year while the annual average flow is 15,085 MG per year.

Response: DEQ compiled flow monitoring records submitted and provided the compiled data to EPA's contractor, Tetra Tech, to be used for establishing existing mercury loads. If available, actual effluent records were used to estimate an average annual discharge for a facility. However, no flow records were available for the four Clean Water Services facilities: Durham, Forest Grove, Hillsboro, and Rock Creek. Therefore, flow information submitted to DEQ in 2017 as part of the variance applications for the four Clean Water Services wastewater treatment plants was applied. This is discussed in Section 5.3.5 POTW Sources in the Technical Support Document and presented in the table notes for Table 5-9.

S_SO#25: Suggested Change ID #298

Description: Appendix A - Mercury Concentrations Reflective of POTW Discharges

Comment: Because median mercury concentration of 2.6 ng/L was used by DEQ to characterize mercury levels for minor municipal facilities when data were not available, this concentration should be used for all facilities where data were not available. The Technical Support Document and table 5-9 (page 89) notes that 11.7 ng/L was used in the model for some POTWs resulting in high modeled mercury concentrations.

Justify the substantially higher concentrations noted in the report or the Wilsonville, Portland (Tryon Creek), and Salem facilities

Response: Table 5-9 identifies POTW facilities lacking mercury monitoring data. To estimate an existing load for a facility lacking site-specific mercury monitoring data, a representative concentration was established using data available from facilities of similar type and size in the Willamette River Basin. More specifically, mercury data from facilities with the same NPDES domestic major class (e.g., NPDES-DOM-C) were applied because the plant capacities are designed to treat similar flow rates. The relatively higher concentrations applied for Wilsonville, Portland (Tryon Creek), and Salem facilities are all based on available facility-specific monitoring records – thus, the concentrations applied are based on the best available data provided by DEQ and represent actual effluent conditions observed at these facilities.

S_SO#26: Suggested Change ID #299

Description: Appendix A - Stormwater Modeling

Comment: Include additional information in the Technical Support Document to better explain the approaches and data that were used for stormwater loads modeling. Add a table to show the MS4 jurisdictions included in the model and the impervious area and effective impervious area estimations used for each to ensure that areas such as those draining to UICs are not included. This will assist

conducting the wasteload allocation attainment analyses, which are precursors to developing benchmarks as specified in Phase I MS4 NPDES permits.

Response: The approach for evaluating urban stormwater loads is discussed in Section 5.3.7 of the TMDL Technical Support Document. Loads were estimated for Phase I and Phase II MS4s listed in Table 5-14 and Table 5-15 and urban Designated Management Areas (DMAs) listed in Table 5-17. Coverages provided by Phase I and Phase II cities and counties were used directly to determine the boundary of the regulated MS4 area. Areas designated as draining to UICs and combined sewers were excluded from the MS4 regulated areas applied in the TMDL; however, this information was only available for Portland. As discussed in Section 5.3.7 of the Technical Support Document, alternative spatial coverages, such as the 2017 city limits coverage, were used when jurisdictions did not submit a coverage. A new table was added to the Technical Support Document listing the estimated areas for Phase I and Phase II MS4s. Loading rates vary across the landscape (e.g., due to soil type, weather, etc.), thus, regulated areas cannot be used directly to accurately attribute the total urban stormwater load to individual jurisdictions.

S_SO#27: Suggested Change ID #300

Description: WQMP - MS4 PLREs and WLAAs should both develop benchmarks and be conducted in the second permit cycle

Comment: Section 13.3.2.2.1 - MS4 Phase 1 requirements - The last bullet requires submittal of a pollutant load reduction evaluation (PLRE) and Wasteload Allocation Attainment Analysis (WLAA). The previous bullet acknowledges that there are insufficient data to develop benchmarks Since the same data used to create benchmarks would be required to conduct both the PLRE and WLAA, these analyses should be treated the same as the requirement to develop benchmarks. That is, that benchmarks, PLREs, and WLAAs should not be required in the first permit cycle. Instead, the permit should require collection and submittal of mercury data during the first permit cycle. The benchmarks should be established and PLRE and WLAA should be conducted in the second permit cycle.

Response: DEQ clarifies that development of benchmarks is not required for evaluation of non-structural controls. DEQ included the statement “due to data limitations, mercury benchmarks are not applicable in the first permit cycle after the TMDL is finalized” to acknowledge that initial data sets may not be adequate for developing mercury benchmarks for evaluation of structural controls. However, qualitative evaluation, as required for non-structural controls, is expected in reporting of pollutant load reduction evaluations and wasteload attainment analyses during the first permit cycle following issuance of the TMDL.

S_SO#28: Suggested Change ID #331

Description: WQMP - Section 13.4.1 Implementation Plan Timeline Coordination

Comment: As part of the Willamette River Basin TMDL five-year review, implementation plans were recently updated and submitted to DEQ in late 2018 and early 2019. Please consider lining up the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance.

Align the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance. Allow an additional time frame for county implementation of six minimum measures in Table 13-11 due to expansive geographies and overlapping jurisdictions.

Implementation plans (Section 13.1.1)

TMDL Text: DEQ typically gives DMAs and responsible persons 18 months to submit new or updated implementation plans following the issuance of a TMDL and WQMP. For this WQMP, DEQ will continue using the 18-month time frame for implementation plan submittal. For point sources, wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. (p. 73-74) MS4 permit holders must also develop and submit a TMDL implementation plan that demonstrates how nonpoint source load allocations will be met. This plan must include management strategies to reduce runoff and erosion that discharge directly to waterbodies. (p97)

Comment: Clarification is needed around these statements and associated requirements. The City and others just submitted updated TMDL Implementation Plans as required by DEQ following the recent 5-year review. Portland's implementation plan (dated March 1, 2019) already covers mercury and describes strategies that the City is using to address this and other TMDL pollutants. Will the City be required to re-submit this plan in 18 months? Please clarify or amend the requirement to make an exception for DMAs that already have TMDL Implementation Plans that address mercury.

Response: DEQ agrees that keeping the five year reporting cycle consistent between the Willamette Basin TMDLs will be more efficient. The last five year review for the Willamette Basin occurred in 2018. The next five-year review will occur in 2023 and will include implementation activities related to the 2019 Mercury TMDL. In other words, the next five-year review will include information about mercury-related strategies that some DMAs started implementing in the middle of their current five year cycle. The objective of this timeline is to retain a consistent five-year reporting cycle for current and future Willamette Basin TMDLs. Some designated management will continue to have alternate five year cycles based on previous implementation and reporting schedules, for example DMAs in the Molalla-Pudding subbasin.

Following the issuance of the mercury TMDL, updated TMDL implementation plans to meet the WQMP will be due within 18 months (i.e. around May 2021 if TMDL approved by end of November 2019). DEQ basin coordinators will review and approve updated implementation plans to ensure plans meet requirements in the revised mercury WQMP. Depending on the content of the implementation plan, some DMAs may already meet requirements, while others will not. It is likely that DMAs will need to make some updates to align with the WQMP, including development of measurable objectives if absent. The implementation plan may also need language to clarify how a DMA's existing MS4 or other program meets the WQMP.

58. Comments from: Dillon, Dave of Oregon Farm Bureau, Oregon Forest & Industries Council, Oregon Association of Nurseries

D_D#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

D_D#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

D_D#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

D_D#4: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system,

the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

D_D#5: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

D_D#6: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

D_D#7: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

D_D#8: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE

under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

D_D#9: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These

requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

D_D#10: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to

gaged flows, the modelers reported that “Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows”; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading. DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

D_D#11: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is “estimated to be 361 g/day”, a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value “351.42 g/day” for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

D_D#12: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to

this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

D_D#13: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

D_D#14: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

D_D#15: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each separately. -Providing examples in which "sites", which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

D_D#16: Suggested Change ID #230

Description: TSS surrogate model – concentration of THg and TSS

Comment: Please resolve concerns about the quality of this analysis, specifically those related to: -Example 1 in Section 1.5 uses the LME model to indicate that a THg concentration of 0.14 ng/L is predicted by a TSS concentration of 4.272 x 10-14 mg/L. The former is a low but plausible concentration for THg in a river, but the latter is many orders of magnitude lower than the lowest TSS concentration one could ever hope to measure in a large river like the Willamette River. -Example 2 in Section 1.5 uses the LME model to relate a TSS concentration of 100 mg/L, which is high yet reasonable for a large river, to a concentration of THg of 8.38 mg/L, which is implausibly high relative to all observations presented in Table 1 of Appendix H.

Response: The error in the units of TSS given in example 1 was corrected in response to this and other comments. The unit error in total mercury is also present in Example 2. At a TSS concentration of 100 mg/L, the predicted total mercury concentration is 8.38 ng/L, not mg/L. At a TSS concentration 80 mg/L the predicted total mercury concentration is 7.48 ng/L, not mg/L. This unit error does not affect the percent reduction calculation; but was corrected in the revised TMDL/WQMP Appendix H.

D_D#17: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including "sites" as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A "random effect" is a statistical term for describing a site specific effect on the value of a variable. The term "fixed" effect refers to how the value of a variable changes according changes in the value of another variable. In the case of the TSS surrogate analysis, the "random effect" is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

D_D#18: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

D_D#19: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate "to estimate allocations for pollutants addressed in the TMDL". However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be "used for evaluating effectiveness of the TMDL" because monitoring of "total mercury can be difficult and cost-prohibitive". This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

D_D#20: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

D_D#21: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

D_D#22: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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59. Comments from: Russell, Mike of Columbia County

R_MCC#1: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

R_MCC#2: Suggested Change ID #236

Description: WQMP - Stormwater - Need clear means of demonstrating compliance with mercury reduction goals

Comment: An 88% reduction goal for non-point sources of mercury without data or a clear means of measurement sets local governments up for noncompliance.

The identified projects for rural communities are broad, expensive, and not easily measured. Regulated entities cannot create and implement a program without a clear means of demonstrating compliance and remain good stewards of public money.

Collection and measurement practices used to identify mercury pollutants are difficult and uncertain, requiring extensive resources. Both MS4 Phase I and Phase II permit holders will be expected to show their progress toward attaining a 75% reduction benchmark without a firm standard of measurement, increasing the risk of noncompliance.

The Draft document needs to specifically state how a county would demonstrate compliance, including addressing Oregon weather events and slope stability issues that are out of a counties control.

Mercury loading is based on a wide variety of diffuse sources, conditions, variable soils, and weather. According to the Oregon Association of Clean Water Agencies (ACWA), the Draft Mercury TMDL includes invalid bases for methodology. For these reasons, several counties are concerned as to how specifically we would demonstrate compliance.

The Draft TMDL requires a 75 percent reduction of mercury loads across the sector of all “non-permitted urban DMAs”, which is a 1 percent estimated total load. This insignificant impact would be impossible to demonstrate specific to the County. We cannot get into a situation where compliance cannot be demonstrated.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control

measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction load allocation. The 75% total mercury load allocation required for city stormwater discharges does not apply to counties.

Counties will work with DEQ basin coordinators to update or revise TMDL implementation plans to include required management programs in the WQMP. DMAs will demonstrate compliance with the mercury TMDL by implementing the DEQ-approved TMDL implementation plan. Compliance with TMDL requirements for MS4 permittees will be demonstrated through compliance with their permit. DEQ acknowledges that events, such as rain, flooding, and fire are natural events beyond human control. DEQ is developing a monitoring strategy to assess implementation actions in meeting mercury water quality standards over time.

R_MCC#3: Suggested Change ID #314

Description: WQMP - Stormwater - Changes to the Impacted Area

Comment: Initially, Columbia County was aware of DEQ's desire to expand TMDL requirements to the lower Willamette, but understood that only a very small portion of Columbia County would be included. With this information, we were not very active in monitoring the process until the draft was released and we saw that the Multnomah Channel was included and took in a larger area of the County including our two largest cities: St. Helens (pop. 13,240) and Scappoose (pop. 7,200). We believe not having County's represented in the creation of the Draft document has caused this confusion.

Response: DEQ clarifies that the Multnomah Channel was included in the 2006 Willamette Basin Mercury TMDL (see Table 1.1 in Chapter 1), available at: https://www.oregon.gov/deq/FilterDocs/chpt1overview.pdf).

R_MCC#4: Suggested Change ID #315

Description: WQMP - Stormwater - Ambiguity in Area of Concern

Comment: For Columbia County, we need more definition on the area of concern/permit boundary within the County. For NPDES MS4's, it has been limited to "urbanizable areas" mostly and did not extend into less populated rural areas. We feel this extension of urban requirements to the mostly rural areas of our county are too burdensome and we are unsure of the benefit gained for the amount of effort required to stand up a mercury reduction program in these areas. NPDES permitting authority is designed to develop a set of designation criteria to all small MS4s located outside of a UA serving a jurisdiction with a population of at least 10,000 and a population density of at least 1,000 people/square mile. Columbia County's rural population density is approximately 34 people/square mile, or 0.34% of a UA. This demonstrates the County is not a UA, nor a small MS4, as defined by current NPDES requirements.

Response:
Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely

populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Columbia County is not currently a MS4 permit holder; therefore, Columbia County will implement core management programs identified in the WQMP related to counties. Columbia County lands falling outside the Willamette Basin watershed do not apply. In addition, the Columbia County cities of St. Helens and Scappoose will be responsible for implementing stormwater control strategies identified in Table 13-10 of the WQMP.

R_MCC#5: Suggested Change ID #316

Description: WQMP - Stormwater - Ability to "Rely on Others"

Comment: NPDES Phase II allowed for Designated Management Agencies (DMA's) to partner with other DMA's to provide the six minimum measures. As an example, many Oregon counties let cities manage new development within the urban fringe areas which lends itself to letting them manage TMDL requirements for new developments as well. Are Counties going to be able to do this under the proposed TMDL or will we have to provide for all six measures independently and possibly overlap management responsibilities with our cities? The WQMP does not address this at all.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

Cities or counties may continue to partner with each other, as appropriate, to meet any requirements. If jurisdictions pursue these partnerships, DEQ encourages cities and counties to have formal agreements in place to ensure requirements are met.

R_MCC#6: Suggested Change ID #317

Description: WQMP – Stormwater - Current Ordinances, Policies, and Procedures may be sufficient without having the administrative burden of a TMDL permit, especially for smaller agencies

Comment: To what extent do existing activities by agencies already meet the intent of the TMDL and can be considered compliant without having to burden small jurisdictions further? We encourage DEQ to pause and perform a gap analysis to determine if actions already being undertaken by small agencies as a matter of course in meeting other regulatory requirements substantially meet the intent of the TMDL Thank you for the opportunity to comment. We recognize the need to protect the water quality of Oregon's rivers, however, we request that DEQ pause and reevaluate the impacts of imposing urban stormwater standards in the rural context.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas

with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns the commenter expressed.

Some cities and counties have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. DEQ also recognizes that under certain circumstances, some cities and counties may already meet some of the requirements in the revised WQMP. In those cases, DEQ asks DMAs to articulate how they are meeting relevant management strategies and document that rationale in their new or revised TMDL implementation plans.

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60. Comments from: Rubin, Jared of Eugene Water & Electric Board

R_JE#1: Suggested Change ID #89

Description: WQMP - Reservoirs - update Figure 13-2

Comment: List Leaburg Lake in Figure 13-2. Remove the Walterville Power Intake and Walterville Pumped Storage Pond from Figure 13-2 and corresponding text in Section 13.3.1.22.3 because they have not been utilized for decades and the pond was completely drained in 2016 and no longer exits.

Response: DEQ agrees and has made these corrections.

R_JE#2: Suggested Change ID #90

Description: WQMP - Reservoirs - correct inaccuracies in Section 13.3.1.22.3

Comment: Remove Walterville Dam/Reservoir because there is no dam and the storage pond no longer exists. Water for the Walterville canal is diverted from the mainstem McKenzie River for the purposes of hydroelectric generation - there is no reservoir storage. In addition, both Leaburg Lake and Walterville Canal are located in the Lower McKenzie Sub-basin.

Response: DEQ agrees and has made these corrections.

R_JE#3: Suggested Change ID #91

Description: WQMP - Impoundments - FERC licensing

Comment: EWEB's reservoirs are located primarily on USFS land and our operations are strictly governed by EWEB's operating licenses from FERC.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan.

Impoundment owners named as responsible persons or DMAs are responsible for identifying measurable objectives and milestones for implementation strategies and goals. DEQ is prepared to provide technical assistance to DMAs and responsible persons as resources are available, however it is EWEB's TMDL responsibility to identify relevant strategies that EWEB can track against a measure of progress, as well as to meet the requirements in section 13.3.1.22 under the header "Measurable objectives, milestones, and WQMP reporting requirements."

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61. Comments from: Fast, Katie of Oregonians for Food & Shelter (OFS), Oregon Cattlemen's Association

F_K#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are

protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

F_K#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

F_K#3: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please

justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

F_K#4: Suggested Change ID #312

Description: Modeling - LA modeling is based on uncertainty

Comment: Load allocation modeling is based on uncertainty. Mercury wasteload allocations are based on six separate and contested computer models, each with accompanying uncertainties. Additionally, the 'mass balance model' has compounded uncertainties because it utilizes two models' outputs as the inputs. This layering of uncertain modeling injects significant uncertainty into the load allocations.

Response: Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

F_K#5: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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62. Comments from: Powers, Mike of Oregon Department of Agriculture

P_M#1: Suggested Change ID #109

Description: Source Assessment - Discrepancy in Willamette Basin agricultural land calculations

Comment: Chapter 1 Section 1.2.2, Table 1-3, p. 20 Table 1-3 reports the following information for Agriculture Total Area and Percent of Total Area (of the Willamette Basin): 912 sq. miles and 8.0% of Total Area. This contrasts with information provided by the Oregon Department of Agriculture (ODA) in the publication State of Oregon Agriculture: Report from the State Board of Agriculture (January, 2019). This reports the following: Willamette Valley total land area approximately 9.0 million acres (Oregon Secretary of State, 2014) Land in farms approximately 1.7 million acres (USDA National Agricultural Statistics Service (NASS), 2014) Using the estimates in the ODA publication, 1.7 million acres is approximately 2,656 square miles and 18.9% of the Willamette Valley.

ODA Comment: ODA wishes to note the discrepancy between the two estimates of the agricultural lands in the Willamette Basin.

Response: The Willamette Valley land area discussed in the State Board of Agriculture report is based on county boundaries, and includes approximately 9.0 million acres. Some of the counties included in the tabulation for the Willamette Valley also have land that drains to basins other than the Willamette Basin, for example western Lane County drains to a coastal basin.

The boundaries of the Willamette Basin in the TMDL are based on hydrography, not county boundaries. Because of the difference in land area covered by these reports, the percentages or acres of agricultural

land cannot be compared. Another important consideration is that the land use categories used in the TMDL do not directly correspond to land management (Table 1-3).

State of Oregon Agriculture: Report from the State Board of Agriculture (January, 2019) can be found at https://www.oregon.gov/ODA/shared/Documents/Publications/Administration/BoardReport.pdf.

P_M#2: Suggested Change ID #110

Description: Source Assessment NPS Groundwater - Groundwater mercury concentrations cited at 17% may be too high

Comment: Chapter 6 Section 6.1.4.3, p. 41. The document says that available groundwater samples show a low level of mercury, around 1 ng/L. Because groundwater makes up a significant portion of total flow of water in the basin, it accounts for about 17% of the total mercury source load.

ODA Comment: The statement that 17% of the mercury load comes from groundwater may not be fully supported by a sufficient amount of data. DEQ appears to have little data on mercury concentrations in groundwater, and much of the data it does have shown it is either non-detect or below 1 ng/l. However, DEQ used a blanket concentration of 1 ng/l for calculating the load. This number may be high, or may have significant uncertainty, considering the available data.

Response: DEQ added this statement to Section 6.1.4.3 "The concentration of total mercury in groundwater will be included in the Assessment and Monitoring Strategy for the TMDL to reduce the uncertainty associated with this source."

P_M#3: Suggested Change ID #112

Description: Source Assessment NPS Atmospheric, groundwater, soil mercury - difficult for ODA and partners to differentiate between the natural and human causes of erosion and mercury

Comment: Section 6.2, Table 6-7, p. 42 In summary, the following Nonpoint Sources may impact agricultural activities: Surface Runoff of atmospherically deposited mercury: Estimated Load of Total Mercury (g/day) 118.0; Relative Contribution to Total Load 32.7% Groundwater: Estimated Load of Total Mercury (g/day) 60.6; Relative Contribution to Total Load 16.8% Erosion of mercury containing soils: Estimated Load of Total Mercury (g/day) 154.6; Relative Contribution to Total Load 42.8%

ODA Comment: Both the Nonpoint Sources (NPS) of surface runoff of atmospheric mercury and erosion of soil mercury estimates are substantial. Both of these sources of mercury result from natural and human-caused erosion. It will be difficult for ODA and partners to differentiate between the natural and human causes of erosion.

Chapter 9, Section 9.2, p. 48. This section notes that a significant portion of the mercury in the Willamette Basin is deposited atmospherically. Figure 5-19 of the TMDL Technical Support Document indicates that 86 percent of surface runoff and 91 percent of sediment erosion may be affected by the natural and human activities within the forestry, agriculture and urban development land use areas.

ODA Comment: ODA does not have the capability to differentiate between natural and human sources of mercury. ODA will not be able to identify or separate the contribution of sediment and mercury of agriculture from other sources.

Response: DEQ acknowledges that differentiating between varied nonpoint sources of mercury and sediment is challenging. In order to help address this, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. This strategy will help DEQ characterize water quality trends within HUC8 watersheds. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading. DEQ encourages ODA, other state agencies, and watershed partners to be collaborative partners in future monitoring efforts in the basin.

P_M#4: Suggested Change ID #121

Description: TSS Surrogate - Mercury to TSS correlation strength questionable. Consider recalculating correlations on 10 yr interval. TSS levels questionable resulting in difficulty monitoring

Comment: Chapter 10 Section 10.3, p. 69 DEQ notes that data was used to fit the Linear Mixed Effects model in order to better understand the TSS-THg and THg-TSS correlation, and that the correlation was strong.

ODA Comment: The desire to use a surrogate for mercury is understandable. However, the correlation may not be as strong as stated. In Appendix H, it shows few relatively high TSS concentrations. The highest is 60 mg/l and the next highest is 30 mg/l. We should be aware that wet month TSS concentrations likely often exceed 50 mg/l; these are likely underrepresented. Corresponding mercury concentrations for 60 mg/l and 30 mg/l TSS levels are 3.18 and 3.45 ng/L, respectively. This does not appear to show a correlation. Other TSS concentrations of 9-17 mg/l also had mercury concentrations near 3 ng/L. No matter how well the correlation equations fit the existing data, the data set itself shows that it doesn't cover a wide enough range of TSS or mercury concentrations. Given that it is difficult to differentiate between natural and human sources of mercury, and it is also difficult to differentiate between natural and human sources of sediment, it seems that the correlation between mercury and TSS is uncertain. This makes it very difficult for agriculture and other nonpoint sources to show whether we are meeting TSS and mercury targets set by DEQ. However, due to the uncertainty, it does show the wisdom of DEQ working with agriculture and nonpoint source partners to show progress over time in an adaptive management process. The calculated correlation equations are also likely to change over time, given that the sources of TSS will also change. DEQ may wish to consider recalculating the correlations on at least a ten year interval, or whenever the milestones are considered.

Table 10-2, p. 70

ODA Comment: ODA is unsure of the level of confidence for the reported TSS levels in Willamette Basin rivers and streams. In addition, ODA is unsure how to monitor the scope of agricultural activities and how they contribute to TSS, especially relative to other human and natural sources of sediment. ODA relies on the technical and human expertise of DEQ to design appropriate studies and to collect the necessary data to determine whether these interim surrogate allocations are being met.

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the strong relationship DEQ's analysis found between Willamette Basin TSS and total mercury measurements. In Section 10.3 DEQ established TSS surrogate targets and their use, which will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The use of TSS surrogate targets and other tools will also be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6. DEQ acknowledges that the initial surrogate targets may be updated, as described in Section 14, and that other surrogates may be evaluated from the data collected as part of the Assessment and Monitoring Strategy.

P_M#5: Suggested Change ID #122

Description: Editorial - ODA Rewording suggested

Comment: Chapter 13, Section 13.3, p. 81. The document refers to the ODA Water Quality Management Program.

ODA Comment: ODA currently prefers to use the term "Agricultural Water Quality Program."

p. 82 The document says "Implementation of the recommendations provided in area plans is voluntary, however ORS 561.191 stipulates that ODA must also adopt rules that protecting water quality in areas designated as exclusive farm use and other agricultural lands."

ODA Comment: Please consider the following. "The Agricultural Water Quality Management Act (ORS 568.900 – 568.933) describes how ODA may implement agricultural water quality management plans and rules. ORS 568.909(2) states that once ODA has designated the boundaries of a plan area, '… the department shall develop and carry out a water quality management plan for the prevention and control of water pollution from agricultural activities and soil erosion. The department shall base the plan and rules adopted to implement the plan upon scientific information.'" ODA has adopted rules that detail requirements on all agricultural lands. The rules describe the outcomes that must be achieved, providing flexibility on how to achieve compliance with the outcomes.

Section 13.8, p. 129. The document says " … The Oregon Department of Agriculture has primary responsibility for control of pollution from agricultural sources (ORS 561.191). This is accomplished through the Agriculture Water Quality Management program authorities granted ODA under Senate Bill 1010 adopted by the Oregon State Legislature in 1993 (ORS 568.900 to ORS 568.933 and OAR 603-090-000 to 603-090- 0120)."

ODA Comment: Please consider this revision. ""The Oregon Department of Agriculture is responsible to prevent and control water pollution from agricultural activities as directed and authorized through the Agricultural Water Quality Management Act, adopted by the Oregon legislature in 1993 (ORS 568.900 to ORS 568.933). It is the lead state agency for regulating agriculture for water quality (ORS 561.191)."

Response: DEQ revised language in the WQMP to be consistent with ODA's recommendations pertaining to the description of their program and regulatory authorities.

P_M#6: Suggested Change ID #123

Description: WQMP NPS farm roads - remove reference to farm roads and ODA development of measurable objectives

Comment: p. 83: In summary, the document describes the water quality threat of farm roads, and expects ODA to develop measurable objectives related to roads.

ODA Comment: ODA is not aware of data showing farm roads as a significant source of erosion and sediment. ODA requests that DEQ remove this reference to farm roads and the expectation to set measurable objectives for farm road pollution. ODA remains committed to working with all our partners to prevent and control water pollution from soil erosion and associated agricultural activities.

Response: DEQ agrees that agricultural road networks represent a relatively small footprint in the watershed, but DEQ does not have data about the impact of agricultural roads. Inventorying or collecting information on the impact of agricultural roads can help determine whether ODA should focus implementation efforts on other agricultural sources of sediment. DEQ will work with ODA to identify information needed to evaluate these as sources of mercury.

P_M#7: Suggested Change ID #124

Description: Source Assessment NPS Bare Ground - revise ODA responsibility to report on metrics

Comment: p. 85 The document says "… to identify specific measurable objectives and timelines such as percent reduction in bare ground during wet months, along with associated implementation timelines for implementing best management practices and conservation practices that address runoff, sediment and erosion. ODA will work with Local Advisory Committees to report on these metrics during the biennial review process."

ODA Comment: Bare ground is a good indicator for the potential of erosion. However, ODA does not have the technical, financial, and human resources to measure bare ground at the landscape scale; ODA has typically referred to DEQ for this scientific expertise. However, ODA welcomes the opportunity to work with DEQ and partners to determine how to accomplish this in the future. Where conservation practice information is available, ODA will attempt to report these accomplishments through the area plan review process.

Response: ODA is responsible for identifying measurable objectives and milestones for implementation strategies and goals. Developing measurable objectives and milestones may be challenging for strategies that address landscape conditions for which there are limited base-line data available. Developing measurable objectives and milestones may also be challenging in circumstances where ODA has yet to develop or adopt a method of analysis. DEQ is prepared to provide technical assistance to ODA as resources are available, however it is ODA's TMDL responsibility to identify relevant strategies that ODA can track against a measure of progress.

P_M#8: Suggested Change ID #134

Description: Monitoring Framework - ODA will rely on DEQ's information mercury and sediment from agriculture but may support small scale project monitoring

Comment: Chapter 13, Section 13.5, p. 123 The document says "… The timeline for attainment of water quality standards for this TMDL is expected to take multiple decades. The primary source of mercury in the basin is air deposition, and while efforts to reduce emissions in North America are ongoing, continued air emissions from global sources may offset these efforts. Other sources of mercury are varied and include buffering and re-release of mercury from the ocean, re-suspension of sediment-bound mercury in waterbodies, and changes in total mercury in groundwater. These legacy mercury deposits will take years to diminish."

ODA Comment: ODA appreciates the DEQ acknowledgement that reducing mercury in the state's streams and rivers will be difficult given air deposition from global sources and legacy deposits. ODA does not have the technical, financial, and human resources to widely monitor for landscape scale sources of mercury and sediment pollution from agricultural activities. ODA prefers to continue to rely on DEQ's scientific expertise to gather this information. ODA is ready to work with DEQ and all partners to reduce sedimentation and mercury concentrations in surface waters. ODA may be in a better position to support small-scale, small watershed or project-specific monitoring to help show progress and the effectiveness of conservation efforts.

Section 13.6, p. 124 The document says "… This monitoring strategy will be used to evaluate effectiveness of DMA and responsible person implementation strategies at meeting allocations and may require certain DMAs to collect data."

ODA Comment: ODA would need additional resources and expertise. ODA has typically relied on DEQ scientific capability and technical resources for monitoring and evaluation as the state's primary natural resource protection and monitoring agency, and ODA's preference is to continue to do so. However, ODA is ready to work with DEQ and partners to improve the state's monitoring strategies and capabilities.

Response: Comment acknowledged.

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63. Comments from: Handaly, Keri Morin of City of Gresham

H_K#1: Suggested Change ID #199

Description: General - Prioritize fish tissue sampling and education

Comment: We support the goal of reducing human exposure to mercury and fish tissue accumulation of mercury due to methylation of total mercury in water bodies. The plan acknowledges that water quality standard compliance will take decades and we agree. Furthermore, the scientific references acknowledge

that even if mercury air emissions were radically improved, the waterbody legacy loading is such that bioavailability and bioaccumulation will not only continue, but also may increase before they begin to decline. As such, our comment is: The protection of human health would be far greater served if resources were put towards fish tissue sampling in the State's impacted waterways from the State of Oregon's budget. This should also be a national funding priority for EPA. Fish tissue sampling information is limited and not readily publicly available. Public information from the Oregon Health Authority relies on limited and outdated information. Information about health risks from eating fish from Oregon's waterways is not well marketed or even signed at many/most waterbodies. The State of Oregon is not adequately funding fish science research to benefit people or sensitive, threatened, or endangered species. The implementation of this plan as written will still result in thousands of Oregonians being exposed to mercury, so we ask the State to fund fish tissue sampling and marketing of information to the public, especially those populations most at risk. Without better fish tissue data on the fish that current consumption standards were designed to protect – that being tribal consumption of salmon – regulated entities are being asked to reduce mercury to meet a worst-case scenario for a target organism, the northern pikeminnow, without adequate data demonstrating this fish is being consumed. Rather than just rely on reduction of new mercury inputs, the TMDL should include plans to ensure monitoring and education are part of the State's strategy.

Response: DEQ agrees that a robust water quality monitoring framework, which includes fish tissue sampling is critical for reaching water quality goals and successfully implementing the TMDL. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL.

H_K#2: Suggested Change ID #200

Description: WQMP - NPS - Requirement should deploy erosion protection and sediment control standards for agriculture and forestry sectors

Comment: Given that the background and references cited acknowledge that atmospheric deposition of mercury is a global air quality issue, we ask that efforts to regulate the transport of sediment-bound mercury focus on demonstrated erosion prevention and sediment control best practices currently used in urban development and construction not only be specified for NPDES regulated permittees (MS4, 1200-C, 1200-Z), but also to the agriculture and forestry sectors covered within this TMDL plan. With forested land within the Willamette comprising almost 52% of the land use, and agriculture and grassland (a portion of which is agriculture) comprising 8% and 17%, respectively, controlling sediment movement from these areas is critical. While agriculture and forestry are vital to Oregon's economy, so is the protection of our water quality, fishing, and recreational resources. We posit that both the agricultural and forestry sectors have both the knowledge, ability, and equipment to implement standard erosion practices, such as those described in the DEQ's 2005 Erosion Manual. Beyond just the prevention of erosion on all lands – be them agricultural, forest or urban – there also needs to be a focus on erosion control practices that will prevent sediment from being transported or eroded from the conveyance channels along private and public roads. Public and private ditches that are maintained in a way that leaves bare soil exposed may be one of the largest sources of sediment entering our streams and rivers, so ensuring that sediment is prevented and controlled in an enforceable manner from all land uses is critical. We are asking for fair and equitable regulatory standards and oversight for all land uses (forestry, agriculture, and roadside ditches at a level similar to what is expected of urban areas) that includes requirements to deploy erosion protection and sediment control standards to prevent sediment from entering ditches, conveyance channels, pipes, or streams.

Response: DEQ agrees with the City of Gresham that reducing erosion and runoff from agricultural and forested lands in the Willamette Basin is important to meeting water quality standards for mercury for the reasons stated in the city's comment. The Oregon Department of Agriculture and the Oregon Department of Forestry are the designated management agencies for land uses associated with agriculture and forestry in Oregon. Both agencies have rules in place to protect water quality, including voluntary programs to help support water quality protection programs. Staff from these agencies have significant technical expertise in determining the effectiveness of erosion and runoff control BMPs over a range of circumstances. DEQ will continue to rely on the expertise of these agencies in applying appropriate BMPs and practices, rather than applying NPDES stormwater control measures to these land uses. Therefore, DEQ is not making changes based on the commenter's suggestion.

DEQ acknowledges that roads and ditches are potentially a significant source of sediment. For these reasons, DEQ specifically called out road management as an important strategy for many land managers, including ODA, ODF, BLM, USFS, and others. Based on public comment, DEQ also made revisions to the county section in the WQMP to better tailor requirements to rural areas. One noted change is to require counties that do not already have an enforcement ordinance in place the ability to enforce on discharges of pollutants to county properties, such as muddy discharges from adjacent lands to county ditches. In addition, DEQ expects to see management measures related to road and ditch maintenance in county TMDL implementation plans.

H_K#3: Suggested Change ID #201

Description: Editorial - Section 13.2.1 - clarify - acute and chronic criterion not protective

Comment: The final sentence in this section is confusing. It states that the acute and chronic criterion are being met, but there is not an additional statement alluding to the fact that these levels are apparently not protective enough to prevent fish tissue levels from exceeding what is needed to meet the fish consumption standard that requires methylmercury to be below 0.04 mg/kg.

Response: DEQ removed the last sentence of the paragraph because it is incorrect. There are several stream segments that are impaired for total mercury, such as the Coast Fork of the Willamette River and Dennis Creek.

The mercury water quality standards that were developed to protect aquatic life do not necessarily correlate to the fish tissue standard that protects human health (i.e. 0.040 mg/kg). The acute and chronic aquatic life criteria for total mercury were developed specifically to protect against short and long-term effects to aquatic life, rather than the concentration in water that will prevent accumulation in fish tissue. Also note that Oregon has acute and chronic aquatic life criteria for total mercury to protect aquatic life in salt water environments.

H_K#4: Suggested Change ID #202

Description: WQMP - Stormwater - Section 13.3.1.11 - do not differentiate between MS4 Phase I and II

Comment: In the subsection talking about the "Six Minimum Measures for Stormwater", this section should be updated to recognize that all MS4 permits (both Phase I and Phase II) include the 6 minimum

measures. As the EPA document referenced in the first sentence clearly states, the inclusion of the 6 minimum measures in the Phase II permits was based on the success of these measures reducing pollutants in the Phase I permits. Because all MS4 permits include these measures, there is no need to differentiate between MS4 Phase I and Phase II permittees in the draft TMDL or the WQMP

Section 13.3.2.2.1 - Do not split Phase I and II permits into different sections

In general, there is not a compelling reason to split Phase I and Phase II permits into different sections. As stated before, the six minimum measures are part of both permits, so the programs that DEQ recognizes are effective at controlling sediment and mercury (e.g. erosion control inspections/enforcement, post construction stormwater standards, illicit discharge detection and elimination, etc.) are already being conducted to the maximum extent practicable. This section might be better simplified to eliminate what is currently under the MS4 Phase I heading, and then alter the text under the MS4 Phase II heading so that it reflects general versus individual permits. All the Phase I permits are individual permits, so the three bullets describing what would be in a mercury minimization plan would then be what Phase I communities would need to develop and submit to DEQ.

Response: DEQ revised the subsection on six minimum control measures within Section 13.3.1.11 to clarify that the measures are required of all permitted MS4s. DEQ did not combine MS4 Phase I and Phase II requirements in Section 13.3.2.2.1, as suggested by the comment. This distinction was retained to ensure all that are interested in this topic can clearly understand what requirements apply to whom based on which permit they are regulated under (MS 4 Phase I individual, MS4 Phase II general or MS4 Phase II individual).

H_K#5: Suggested Change ID #203

Description: WQMP - Stormwater - acknowledge that some existing MS4 SWMPs already address nonpoint sources outside jurisdictional boundaries - Section 13.3.2.11.1

Comment: There seems to be an assumption in the way the WQMP is written that MS4 permittees do not currently apply the six minimum measures to areas that do not connect to their public pipes. In Gresham, the Stormwater Management Plan and city code is applied equally across our permit boundary. There are “natural areas” within the city boundary that are not subject to the six minimum measures, but that is because these areas are typically managed as upland or riparian forest that is, or will be, enhanced to meet the temperature TMDL goals and is not subject to (and therefore erosion control permitting and post construction standards would never apply unless they are needed during a restoration effort). For DMAs that already apply all aspects of their Stormwater Management Plans (SWMP) – which integrate natural areas managed for temperature TMDL compliance, as well as the six minimum measures (including erosion control and post construction requirements) – we ask for an acknowledgement that the existing MS4 permit and SWMP already address nonpoint sources. Phase I communities have been adaptively managing their sediment control programs for the past 24 years, which include rigorous Erosion Prevention and Sediment Control inspection and enforcement programs as well as other sediment removal best practices such as pipe cleaning, catch basin cleaning, street sweeping, addition of vegetated stormwater controls and infiltration objectives. Moreover, we report all activities and sediment removal annually in reports submitted to DEQ.

Response: DEQ agrees with the city of Gresham’s comments and added language to the WQMP that acknowledges that some MS4 permit holders may already be meeting the six stormwater control measures. In cases where cities and counties can show that the MS4 permit covers their entire jurisdiction,

where appropriate, then the six stormwater control measures are already being applied based on implementing the MS4 permit. DEQ acknowledges that not all areas of a city or county jurisdiction, such as natural areas, would be applicable to all six control measures.

Application of MS4 permit requirements can vary between permit holders, therefore, DEQ asks cities and counties with MS4 permits to include this important information in their TMDL implementation plan update and clearly articulate how the six stormwater requirements are being met. The overarching goal is to ensure that urban areas in MS4 jurisdictions are implementing, at a minimum, the six stormwater control measures identified in Table 13-10 throughout its jurisdiction. DEQ added language to the WQMP to clarify this goal.

H_K#6: Suggested Change ID #204

Description: WQMP - Stormwater - MS4 - Delay requirements for pollutant load reduction benchmarks and WLAAs

Comment: Many of the requirements currently listed under the MS4 Phase I subheading will require generation of reports that will not result in improvements to any of the programs currently being implemented to control sediment and mercury from the urban areas covered under MS4 permits. While collection of paired TSS-THg data is something that all Phase I communities have been, and will continue, doing, we currently do not have adequate data on the effectiveness of various BMPs at removal of mercury to do the calculations required to provide pollutant load reduction benchmarks or a wasteload allocation attainment assessment (WLAA). While that might be something we can do at some future date – once enough paired TSS-THg data has been collected to develop an acceptable relationship for using TSS as a surrogate measurement – the development of these reports is not something we have adequate data on BMP effectiveness to calculate at this time. We request that this analysis be deferred until adequate data is collected to establish the statistical validity of using TSS as a surrogate in order to model benchmarks and the WLAA.

Response: DEQ made changes to clarify the requirements for MS4 permittees. As many of the control measures applied for mercury reduction are non-structural, development of benchmarks is not required for MS4 reporting and qualitative reporting in the mercury wasteload allocation attainment assessment will be acceptable. The requirements specifically note the data limitations mentioned in the comment and the requirements for MS4 Phase I's in Section 13.3.2.2.1 of the TMDL/WQMP acknowledge that mercury benchmark development for any structural controls will not be applicable in the first permit cycle after the TMDL is finalized. DEQ intends that data collected during the first permit cycle following TMDL finalization will allow for data to complete these future evaluations, as requested in the comment. In addition, DEQ anticipates that part of the effectiveness analysis for each permittee can and should be qualitative to ensure that the actions that cannot be measured, for whatever reason, are evaluated.

H_K#7: Suggested Change ID #205

Description: TSS Surrogate - Editorial - "surrogate TSS-THg samples" is confusing term

Comment: There are several grammatical items in this support document that would be good to update. Throughout this document, the use of the term "surrogate TSS-THg samples" is a confusing, since these

are paired samples that were assessed to determine whether the correlation is strong enough that TSS could be used as an appropriate surrogate for THg.

Response: DEQ appreciates the comment and made revisions to Section 10.3 and Appendix H in response to this and other comments.

H_K#8: Suggested Change ID #206

Description: Editorial - Appendix H - Section 1.5 Recommendations - Unit error

Comment: In the example calculations at the end of this section, there appears to be a unit error. In example (1), the final TSS value of 4.272 x 10-14 mg/L does not make sense. This value is so small it would be immeasurable. In examples (2) and (3), the final THg values calculated are 8.38 mg/L and 7.48 mg/L, which would be extremely high. Our comment is that these units may need correction to ng/L.

Response: DEQ corrected the unit error in the example calculations. The units should be ng/L for total mercury. Please note that the units do not affect the percent reduction calculations for TSS.

H_K#9: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which

delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant

concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

H_K#10: Suggested Change ID #244

Description: WQMP - MS4 submittals - do not require multiple submittals of SWMP to address mercury

Comment: 9. Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System: This section requires the inclusion of specified terms in MS4 Phase I permits upon renewal to implement the TMDL. The first bullet requires a mercury minimization section within the "Stormwater Management strategy." Presumably this refers to the permittee's Stormwater Management Plan (SWMP), not a separate document. Given the comprehensive nature of SWMPs, a second, redundant document should not be required. This section should be clear that it refers to the SWMP.

Including new requirements to create a separate mercury plan/update of the existing Stormwater Management Plan outside of the typical permit renewal cycle is an inefficient use of already limited time for both MS4 and DEQ staff and serves no environmental benefit, as DEQ already has copies of our documents. We request that DEQ use the same permit renewal and reporting cycle required for the MS4 permit be utilized for any language updates needed to specifically satisfy the Mercury Water Quality Management Plan, as we do not see new or additional information that we have/can provide beyond what is extensively documented and reported to DEQ annually.

It's unclear if the "mercury minimization section" referenced here is intended to be a stand-alone submittal, part of an annual report, or a Stormwater Management Plan (SWMP) revision. The latter is inappropriate. A new SWMP is generally required upon re-issuance of the MS4 permit, so this provision as written would force permittees to revise their SWMPs within two years of having drafted an entirely new SWMP, which is a very resource-intensive process and technically constitutes a permit modification. The SWMP comprehensively addresses all pollutants associated with stormwater runoff (including and especially sediment), so creating a duplicative or obsolete section within the SWMP that repeats all the existing pollution reduction strategies simply is not useful. Please modify language in the first bullet as noted to clarify this as a stand-alone submittal along with, or as part of, the second annual report.

Response: Thank you for the feedback. DEQ clarified the expectations in the revised language in Section 13.3.2.2.1, Municipal Separate Stormwater Sewer System.

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64. Comments from: Hebard, Dennis

Hb_D#1: Suggested Change ID #2

Description: WLA - 700PM - winter storms move more mercury in streams than dredging

Comment: Do not prohibit suction mining in Tributaries to Dorena Reservoir because winter storms move more sediment than mining

Response: Although large winter storms have been shown to move sediment downstream to reservoirs, the studies referenced in the TMDL show that, when mercury is present in sediment, suction dredge mining mobilizes mercury and this also increases its availability for methylation downstream. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization and methylation of mercury during suction dredge mining, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

Hb_D#2: Suggested Change ID #23

Description: WLA - 700PM - density of mercury settles it out within 300 ft. turbidity permit limit so no significant harm

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because elemental mercury is heavy and dense and would not travel beyond the 300 foot plume limit in the 700PM before settling, so does not cause significant harm to streams.

Response: DEQ acknowledges that stream dynamics are complex and that mercury mobilization, methylation and settling of the many forms of mercury that could be present have not been quantified. DEQ agrees that the density of elemental mercury may assist in it settling out within the 300 feet allowable for visible turbidity under the 700-PM permit. Once elemental mercury has been disturbed in stream sediments, it can become semi-dissolved in microscopic beads that can be held in suspension within flowing waters. Some of this mercury may settle out of suspension prior to reaching Dorena Reservoir during low-flow periods. However, because it is not deeply buried, it can be easily resuspended into the water during periods of higher flow which occur every year during the fall and winter. The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

Hb_D#3: Suggested Change ID #38

Description: WLA - 700PM - HgS cinnabar makes up 64% of Champion Mine stream sediment and is not a source of dissolved Hg2 in streams

Comment: Do not prohibit suction dredge mining in Champion Creek because mercury in sediment there is from natural sources.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of Champion Creek (which is tributary to Dorena Reservoir) ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Hb_D#4: Suggested Change ID #39

Description: WLA - 700PM - I have not found liquid mercury while dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because I and other miners have never found liquid mercury while dredging in Sharps Creek and Brice Creek and in Idaho.

Response: The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states (including "floured"), transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Hb_D#5: Suggested Change ID #94

Description: WLA - 700PM - remediation of Champion Mine also cleaned up mercury in Brice Creek so additional sampling is needed

Comment: Do not prohibit suction dredge mining in Brice Creek because Champion Mine remediation also cleaned up mercury in Brice Creek and additional sampling is needed to show current mercury contamination levels

Response: In response to this comment, DEQ reviewed available reports on the Champion Mine remediation activities and post-removal action sampling, including sediment sampling in Champion Creek between 2004 and 2012 (report available at: https://www.deq.state.or.us/Webdocs/Controls/Output/PdfHandler.ashx?p=bb0d35d9-a2bd-4906-bc01-ad7b9dc1b9c6pdf&s=Champion Mine 2012 FINAL Monitoring Report 1-10-13.pdf). DEQ did not find that removal actions were conducted within Champion Creek, rather tailings piles were removed from the uplands and a wetland treatment system was installed to prevent metals contaminated discharges from leaving the uplands. Post-removal action sampling at five locations within Champion Creek between 2004 and 2012 detected mercury at concentrations ranging from 0.08 mg/kg to 8.78 mg/kg. Sediment samples in 2012 detected mercury in Champion Creek sediments ranging from 0.16 mg/kg to 5.7 mg/kg. DEQ included this reference and updated information in the TMDL as further confirmation of the presence of mercury contamination in Champion Creek. The studies referenced in the TMDL show that, when mercury is present in sediment, the process of suction dredging increases the mobility of mercury within streams, which increases its transport to and methylation potential in downstream waterbodies such as Dorena Reservoir. DEQ regulates permitted point source discharges, including suction dredge mining, and determined that a 10% cumulative decrease in mercury from permitted point sources is needed in the basin to reach reduced in-stream targets over time and eventually safer fish consumption levels. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

Hb_D#6: Suggested Change ID #208

Description: WLA - 700PM - studies used in the TMDL do not apply to tributaries to Dorena Reservoir

Comment: Do not prohibit suction mining in tributaries to Dorena Reservoir because the studies referenced in the TMDL are not applicable to the tributaries to Dorena Reservoir

Response: The studies referenced in the TMDL include sediment sampling in the tributaries to Dorena Reservoir, which are directly relevant to establishing the presence of mercury contamination in these streams. Studies from CA, WI and FL were also cited and are relevant as to potential physical effects due to suction dredging in any stream. These physical effects include demonstrated disturbance, mobilization and methylation of mercury, when it is present in stream sediment being suction dredged.

Hb_D#7: Suggested Change ID #209

Description: WLA - 700PM - apply intake credit provisions (under OAR 340-045-0105) to 700PM

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir for 2 years and keep 700PM registrant numbers constant and apply intake credit provisions while conducting sampling to determine the reasonable potential of suction mining to increase mercury in the water column and conduct an antidegradation review

Response: OAR 340-045-0105 (1) General Provisions states that the intake credit provisions do not alter DEQ's obligation to develop and apply effluent limitations consistent with the assumptions and requirements of any available waste load allocations for the discharge. Because the Willamette Basin TMDL waste load allocation expressly prohibits discharges of mercury from permitted suction dredge mining, intake credit provision cannot be applied to these discharges. DEQ's Antidegradation Policy is described in OAR 340-041-0004, which states in (1) Purpose that the policy applies to new or increased point and nonpoint sources of pollution. Antidegradation review was conducted on the decision to issue the 700PM permit and is not required for implementing the TMDL wasteload allocation in the existing permit.

Hb_D#8: Suggested Change ID #210

Description: General - WQ impairment listings

Comment: Row River, Sharps Creek, Brice Creek, Champion Creek are not listed as Category 4 or 5 needing a TMDL

Response: As stated in Table 1-1 of the Willamette Basin Mercury TMDL, "this TMDL covers all State of Oregon perennial and intermittent streams in the Willamette Basin." Sediment sampled in Row River, Sharps Creek, Brice Creek, Champion Creek was shown to have elevated concentrations of mercury, ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). These streams flow to Dorena Reservoir, which is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury. Therefore, Regardless of whether or not Row River, Sharps Creek, Brice Creek, Champion Creek have

been designated as impaired on the 303(d) list of impaired waterbodies, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

Hb_D#9: Suggested Change ID #211

Description: WLA - 700PM - mercury in sediment does not pose risk in water column

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because mercury concentrations in sediment in these streams is not as high as those near Black Butte and Bonanza mines and streams do not exceed limits of the fresh water risk assessment screening level 2 tables under Guidance for Ecological Risk Assessment, https://www.oregon.gov/deq/FilterDocs/GuidanceEcologicalRisk.pdf

Response: Mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013). These concentrations exceed the Level II freshwater screening level value for mercury of 0.2 mg/kg in DEQ's Guidance for Ecological Risk Assessment, referenced in the comment. Comparison to concentrations found in streams impacted by the Black Butte and Bonanza mines is not relevant to DEQ's decision to prohibit suction mining in streams tributary to Dorena Reservoir. Instead, DEQ considered the mercury concentrations measured in sediment in tributaries to Dorena Reservoir, that the reservoir is a known area of methylation and is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury. Because the studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated, DEQ is prohibiting suction dredge mining in these tributaries.

Hb_D#10: Suggested Change ID #212

Description: Modeling - Limited data sets are not enough for proper modeling not even the mass balance model.

Comment: Limited data sets are not enough for proper modeling not even the mass balance model. From the 2006 TMDL (using limited data sets n=4 from 2002-2003) the modeling of the annual THg load from the BMD was estimated as 0.12 kg/yr the annual THg from the Black Butte Mercury mine is 1.34 kg/yr this is 1100% higher than the Bohemia Mining District.

Response: DEQ considers the modeling and analysis sufficient to represent the fate and transport of mercury to determine the allocations for the current TMDL.

Hb_D#11: Suggested Change ID #376

Description: WQC - Remove the mercury criterion

Comment: Remove the Mercury water quality standards, they are unattainable, they are 10 times lower than they need to be. It's not backsliding, they are not lowered just removed, and would revert to EPA standards.

Response: EPA approved DEQ's mercury water quality criteria in 2012. Further action on DEQ's mercury water quality standards is not contemplated at this time.

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65. Comments from: Hack, Jodi of Oregon Home Builders Association

H_J#1: Suggested Change ID #180

Description: WQMP - Stormwater - proposed post construction stormwater standards - remove controls required for residential development beyond the MS4 permittee boundaries

Comment: It appears the proposed Water Quality Management Plan requires the same six storm water controls as the MS4 Phase II across a broader group of Designated Management Agencies (DMAs). Although the DMAs appear to have slightly more flexibility than the MS4 permittees, OHBA continues to have similar concerns as previously expressed. The proposed DMAs' post-construction stormwater standards:

· increase housing costs. The added requirement of post-construction stormwater controls on residential lots with a quarter acre of impervious area will increase the cost of housing. The engineering fees, materials and labor will potentially add up to $20,000 per lot. A National Association of Home Builders (NAHB) study found that for every $1,000 increase in the price of a home in Oregon 1,839 families are priced out of buying because they cannot obtain a mortgage. In addition, many of the DMAs are small jurisdictions with little to no capacity to comply with the required permitting of post-construction stormwater controls. This will increase the time involved in the permitting process, which adds more costs to the project, and is an unfortunate and unwelcome outcome given the unprecedented housing crisis facing Oregon.

· decrease housing production. By requiring more aggressive on-site treatment of stormwater, land that would otherwise be developable would contain stormwater facilities instead of housing. This has far reaching consequences as it impacts allowable residential density and buildable land supply.

· assumes away significant post-construction issues. For example, homeowners responsible for post-construction maintenance and operation of stormwater facilities – whether or not there is an organized community association – will not have the necessary expertise to keep even the most rudimentary stormwater facility functioning properly since the developer or builder will have moved on once the project is sold.

· treats spot lot infill development as though it was a traditional subdivision. This puts developers in a bind between state land use policy (which encourages if not insists upon infill) and the practical realities

of complying with state environmental policy. For example, an identical house built in a subdivision after a new regulation comes into effect will cost significantly more than one built before, but it cannot be sold for the higher cost because it will be appraised at the value of the lower cost existing neighboring houses.

· assumes numerous facts that aren't in evidence. Such as the legal or environmental basis for non MS4 permittees obligation to address TMDLs. Or the efficacy of the parcel by parcel stormwater controls on mitigating the concentration of mercury in fish.

In conclusion, we believe that the draft permit is far more likely to result in higher housing costs and lower housing production than it is in cleaner water. We are asking DEQ to remove the additional post construction stormwater controls that are required for residential development beyond the MS4 permittees' boundaries.

OHBA remains committed to our legal obligation to comply with state and federal law and responsibility to protect Oregon's waters. While we cannot support or agree with this TMDL, we will commit to working productively with DEQ staff and our local government partners to improve water quality in Oregon. Sincerely, Jodi Hack, CEO OHBA

Response: DEQ acknowledges OHBA's concern related to housing costs. Based on other public comments, DEQ revised requirements for counties, which included removal of post-construction requirements. DEQ agrees that counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. DEQ also included in the WQMP examples of county BMPs, such as onsite stormwater management on county-owned lands for existing properties, new development and redevelopment.

H_J#2: Suggested Change ID #181

Description: WQMP - Stormwater - proposed post construction stormwater standards - provide a justification for expanding the requirements to rural areas

Comment: Section 13.3.1.11 Local Governments: Cities and Counties The mercury TMDL requirements have been expanded to cover more jurisdictions. Previously, the requirements applied to cities with populations greater than 10,000 and areas permitted under MS4. The proposal expands the requirements to cities with population greater than 5,000 and MS4 areas outside of urbanized areas. The hydrology of the rural areas is significantly different from urban areas. The statewide land use system restricts the amount of development and requires lower density in rural areas. This results in lower impacts from the impervious areas that is allowed in these basins.

Please provide a justification for expanding the requirements to rural areas.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads.

H_J#3: Suggested Change ID #223

Description: WQMP - Stormwater - Minimum Control Measures #5 and #6 are more stringent than federal MS4 requirements, which is unbalanced given the 1% contribution of unpermitted urban areas

Comment: The DEQ standard for rural counties in the Draft Mercury TMDL is higher (more prescriptive, stricter) than the EPA standard for urban areas. It is requested that the specific triggers and thresholds in Minimum Control Measures #5 and #6 that are not part of EPA's guidance, are beyond the 1200-C program, and are not necessary in the rural setting.

Municipal discharges (i.e., permits for discharges from MS4's) require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP). This MEP standard is used for large and medium MS4's. (Clean Water Act, Section 402(p): NPDES, Municipal and Industrial Stormwater Discharges.) For small (Phase II) municipal dischargers, the MEP standard is also used, and loosely defined by EPA Guidance as satisfying the Six Minimum Control Measures. (Stormwater Phase II Final Rule; Small MS4 Stormwater Program Overview; Fact Sheet revised Dec. 2005.) The Draft Mercury TMDL DEQ document imposes a higher, more restrictive, and more prescriptive standard than the MEP standard used for urban stormwater, and a higher standard than the EPA Guidance.

Prescriptive triggers added by DEQ in Control Measures #5 and #6 go beyond reasonable management measures applicable to urban DMA's. In this case, they are applied to the "non-permitted urban DMA's with a population of 5,000 or greater" (Table 13-10; Draft (Revised Willamette Basin Mercury) TMDL for Public Comment; July 3, 2019.). Thus, these standards go beyond EPA guidance advised for bigger urban areas (above 10,000), and beyond EPA guidance to not apply (i.e., allow a waiver) for population densities below 1,000 people/sq. mile.

If the DEQ decides to maintain the 1/2 acre threshold of requiring full Erosion & Sediment Control Plans (ESCP) in the Final Mercury TMDL, then DEQ should consider amending the 1200-C program (which delegates ESCP permitting to DEQ where land disturbing threshold is one acre or more) to ½ acre or more, to avoid the burden this will cause on small cities and rural counties within the Willamette Basin.

Again, we are talking about controlling less than 1% of the Mercury problem which is not a problem since it is so diluted. Can the DEQ provide an answer why this is the case?

Remove minimum threshold of 1/4 acre for post-construction projects. Table 13.10 Minimum requirements for implementing the six stormwater measures - #6 Post-Construction Site Runoff for New Development and Redevelopment. Another concern is the minimum threshold of 1/4 acre for post-construction projects. These additional requirements for county road projects will lead to increased project costs and, given modern budget constraints, will negatively impact our ability to keep our road systems maintained in safe working order. In addition, the limited width of existing road rights-of-way may require counties to purchase farm land to meet requirements, which will add significant additional costs. Counties are also concerned that having post-construction stormwater facilities built in areas where no other water quality facilities are located will have a negligible benefit and not be reflective of the overall cost. Adopting a quarter acre threshold for project sites is extreme, exceeds the federal standard of one acre disturbed and conflicts with local design standards. While it may be appropriate for large metropolitan communities such as Portland where rates of redevelopment and population density are both higher than average, this proposal is inappropriate and unworkable for small communities. This mandate

will impose new regulations on numerous small, low-risk sites with little potential for environmental harm. We recommend removal of this requirement.

Specific requirements for Construction Site Runoff Plans and Post-Construction Site Runoff Plans are concerning. Polk County is very rural with large tracts of land that are managed for timber and agricultural production. Much of the County has an 80-acre minimum parcel size, but it is not uncommon for tracts to exceed hundreds of acres. Requiring a 0.5-acre and 0.25-acre threshold for these Plans is unreasonable when the amount of disturbed land or impervious surface is disproportionate in comparison to the entire tract size and field conditions. For example, this permit would necessitate counties to require a Post-Construction Site Runoff plan when a property owner constructs an 11,000 square foot outbuilding on a 160-acre sized property that is entirely managed for timber production. Natural processes would filter stormwater runoff and the chances of off-site discharge is unlikely. This scenario would be frequent under the current draft permit language. Rather than having a standard acreage threshold (i.e.0.5 acre or 0.25 acre), an alternative could be based on a ratio of disturbed land/impervious surfaces compared to tract size and field conditions. Proximity to surface water may also be a relevant factor to consider.

Our experience tells us the majority of illicit discharge notifications relate to agricultural operations, and are referred to the Oregon Dept. of Agriculture. Again, developing a program that we have no control regarding enforcement seems ineffective and useless. Not to mention the impact the program will have on strained County resources.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities, and roads. Revising county requirements addresses some of the concerns commenters expressed.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have a population of 5,000 or greater) to implement the six stormwater control measures. Mercury data from Phase I MS4 systems showed that stormwater contains environmentally relevant concentrations of mercury (i.e. median of 4.62 ng/L) even though the sector's overall load to the basin is small. In addition, modelling analyses showed that mercury contained in stormwater is primarily a function of runoff and erosion from impervious areas, rather than from specific sources in large urban areas. Therefore, mercury is likely present in stormwater from smaller cities and should be reduced to the maximum extent practicable.

Some commenters had concerns about extending EPA's MS4 six stormwater control requirements to cities with populations less than 10,000 people. TMDL regulations in OAR 340-042-0040(4)(l)(c) specify that the WQMP will propose "management strategies designed to meet the wasteload allocations and load allocations in the TMDL. This will include a categorization of sources and a description of the management strategies proposed for each source category." DEQ believes the six stormwater control strategies are an appropriate strategy for reducing mercury and sediment in an urban environment. DEQ chose to rely on an existing program with a proven track record for reducing stormwater pollutants, rather than developing a new set of stormwater control measures specifically aimed at mercury. Furthermore, it is not necessary for DEQ to align its TMDL management strategy requirements with EPA's MS4 program specifications.

Some cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For

cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

Given the considerations above, DEQ did not make any changes to city stormwater requirements.

One commenter asked whether DEQ should consider amending its 1200-C construction stormwater permit, which delegates erosion control permitting to DEQ for land disturbing activities of one acre or more, to ½ acre or more, to avoid burdening small cities with implementation of this program. DEQ welcomes input on all draft permits during the public comment period. The current 1200-C construction stormwater general permit expires in December 2020. DEQ anticipates the draft will be posted for public comment around mid-2020 with the goal of having a final renewed permit before the current one expires.

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66. Comments from: Mabe, David of Bureau of Reclamation, Pacific Northwest Region

M_D#1: Suggested Change ID #88

Description: WQMP - BOR - authority of DEQ to require actions limited

Comment: BOR states that the Federal statues requiring the construction, operation, and maintenance of Scoggins Dam limit the authority of ODEQ to require Reclamation to implement certain kinds of actions, including best management practices.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan.

Impoundment owners named as responsible persons or DMAs are responsible for identifying measurable objectives and milestones for implementation strategies and goals. DEQ is prepared to provide technical assistance to DMAs and responsible persons as resources are available, however it is BOR's TMDL responsibility to identify relevant strategies that BOR can track against a measure of progress, as well as to meet the requirements in section 13.3.1.22 under the header "Measurable objectives, milestones, and WQMP reporting requirements."

67. Comments from: Machinski, Penny of Portland General Electric Company.

M_P#1: Suggested Change ID #93

Description: Source Assessment - Do not include impoundments as a nonpoint source of mercury loading

Comment: Do not include impoundments as a source of mercury loading because although mercury may be present in the sediments captured behind an impoundment, neither the impoundment itself nor affiliated dam operations and maintenance are sources of mercury. While dam operations may affect methylation rates, EPA's TMDL rules define loading as introducing matter into a receiving water. (40 CRF 130.2(e)).

Response: The CWA requires that TMDLs be developed for water quality limited waterbodies in order to bring the waterbodies into compliance with standards. In the Willamette Basin Mercury TMDL, DEQ's analysis identified reduction of methylation processes as necessary for meeting the fish tissue methylmercury criterion. DEQ's analysis also identified impoundments and reservoir operations as potential routes for methylation of mercury. In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from DMAs and responsible persons must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control. In requiring DMAs and responsible persons to provide plans to change processes, practices or activities and conditions that cause or may cause pollution DEQ is meeting the requirements of state and federal law.

M_P#2: Suggested Change ID #95

Description: WQMP - Impoundments - focus on largest impoundments

Comment: Section 13.3.1.22 of the draft TMDL targets only impoundments owned by the four largest reservoir owners, regardless of impoundment size. Focus on the largest impoundments, regardless of ownership.

Response: DEQ evaluated the cumulative impoundment volume by owner to identify owners with the most impact by volume in the basin. As noted in Section 14.1.6, DEQ intends to employ an adaptive management approach to implementing the TMDL, which will be informed by the Assessment and

Monitoring Strategy being jointly developed by DEQ and EPA. As warranted by information collected and evaluated, DEQ will consider expanding focus to smaller reservoirs.

M_P#3: Suggested Change ID #97

Description: WQMP, Appendix E - PGE does not meet definition of DMA

Comment: PGE does not meet the definition of a Designated Management Agency. Appendix E includes PGE in the list of DMAs and responsible persons, but the table does not differentiate the two. Also in the text (section 13.3.1.22), PGE is described as a DMA. PGE is not a public entity that has regulatory authority over other entities, and does not meet the definition of a DMA as defined in OAR 340-042-0030(2).

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

DEQ changed the text in Section 13.3.1.22 to reflect PGE's status as a responsible person rather than a DMA. However, DEQ did not distinguish between DMA's and responsible persons in Appendix E because responsibility to develop implementation plans is the same and specifics are provided in the appropriate sections of the WQMP.

M_P#4: Suggested Change ID #98

Description: LA - 88% reduction target applies to each source or sector as a whole

Comment: Clarify whether each of the General Nonpoint Sources and Background in Table 10-1 will be expected to meet the 88% reduction target, or whether achievement of the sector as a whole will be sufficient.

Response: The 88% reduction is assigned to the sector as a whole. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

M_P#5: Suggested Change ID #99

Description: WQMP - clarify criteria for de minimis mercury loads

Comment: Section 13.1.1 indicates that DEQ may determine that a nonpoint source implementation plan is unnecessary based on de minimis mercury loads, but is vague on the criteria that might be applied. The lack of clarity makes long-term compliance planning difficult for regulated, or potentially regulated entities.

Response: DEQ clarified in the report that DEQ may make a determination that nonpoint source implementation plans are not necessary for certain DMAs and responsible persons based on factors, such as inaccurate identification of DMA or responsible person, or entity does not discharge to a waterbody.

M_P#6: Suggested Change ID #100

Description: WQMP - Impoundments - clarify use of Table 13-19 (best management practices for reservoirs)

Comment: Table 13-19 lists best management practices for reservoirs. However, the table is not referenced in the text, and it is unclear whether the listed strategies must be considered by the impoundment owners, included in the TMDL implementation plan, or are merely included in the draft TMDL as examples.

Response: DEQ clarified that the best management practices in Table 13-19 are included in the TMDL/WQMP as examples.

M_P#7: Suggested Change ID #101

Description: WQMP - Impoundments - best management practices and FERC

Comment: Section 13.3.1.22 establishes expectations for actions to be undertaken by dam owners and operators, including a methylation assessment and implementing best management practices. Please note that the regulatory authority for the Clackamas River Hydroelectric Project is the Federal Energy Regulatory Commission (FERC). Any measures at the Project to implement the TMDL may be subject to review and approval by FERC.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan.

Impoundment owners named as responsible persons or DMAs are responsible for identifying measurable objectives and milestones for implementation strategies and goals. DEQ is prepared to provide technical assistance to DMAs and responsible persons as resources are available, however it is PGE's TMDL responsibility to identify relevant strategies that PGE can track against a measure of progress, as well as

to meet the requirements in section 13.3.1.22 under the header “Measurable objectives, milestones, and WQMP reporting requirements”

M_P#8: Suggested Change ID #102

Description: General - acknowledge that criterion is not achievable and initiate a use attainability analysis to support revised methylmercury criterion

Comment: PGE is concerned that strategies outlined in the Water Quality Management Plan (Section 13) will not be successful in reducing mercury loads by the 88 percent required to achieve the target methylmercury fish tissue criterion cited in the draft TMDL. According to Table 6-7, more than 90 percent of the current mercury load is from air deposition or naturally-occurring mercury in soils, and more than 30 percent of that mercury originates from outside of Oregon. It appears from the table that less than 5 percent of the current load is from sources currently regulated by the DEQ water quality program. As such, PGE encourages DEQ to acknowledge in the final TMDL that the criterion is not achievable and to immediately initiate a use attainability analysis (UAA) to support a revised methylmercury criterion. PGE would prefer that DEQ refocus expectations on a more realistic future state now, rather than waiting for one or more 5-year implementation planning cycles to be completed.

Response: DEQ anticipates that the continued and increased efforts required of the 170 designated management agencies and responsible persons to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ acknowledges that attainment of the criteria will take time. Through the adaptive management process, DEQ will continue to address achievement of the methylmercury criteria. Information gathered through the Monitoring and Assessment Strategy will help DEQ become more specific about the timeframe for achievement of the standard. As provided in the Clean Water Act, DEQ will consider pursuing a Use Attainability Analysis and criteria revision process if the criterion is not attained after iterative implementation of controls and revisiting of the watershed model with a more complete understanding of mercury and reduction barriers within this large basin.

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68. Comments from: Jones, Jenna of League of Oregon Cities

J_JL#1: Suggested Change ID #194

Description: WQMP - Stormwater - Request creation of a stakeholder work group

Comment: The LOC is requesting the creation of a stakeholder group that will work cooperatively to develop a workable, right-sized approach and Water Quality Management Plan that still aims to achieve water quality improvements.

It is the LOC’s understanding that several small cities will be required to serve as designated management agencies (DMAs) and responsible persons under the draft TMDL. It is also our understanding that the decision to require small cities, with populations of 5,000 or greater, to serve as designated management agencies, came later in the process of developing the draft TMDL. With that being said, we would

encourage DEQ to develop a stakeholder group, representative of small city, district and county interests, that can work cooperatively and constructively with the state to develop a framework for the Water Quality Management Plan and find ways to allow for added flexibility, feasibility and can be implemented by small communities. We believe this will allow for a more appropriate "right-size" approach that will result in targeted, and more focused efforts, and real results for the improvement of water quality.

Response: DEQ acknowledges the commenters' concerns around flexibility for small communities. There are 19 cities that have populations of 5,000 people or greater that will need to implement six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. DEQ anticipates that this timeframe will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff also regularly develop workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

J_JL#2: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

J_JL#3: Suggested Change ID #196

Description: WQMP - Stormwater - Request flexibility for small cities

Comment: The LOC strongly encourages the department to consider a more flexible model and approach that we are confident will result in better outcomes and compliance. We would like to see a "right-size" approach that reflects the capacity of small cities to effectively engage in this work, meet better outcomes and improve compliance.

The LOC represents all cities in Oregon. Our members vary greatly in size, demographics and their budgetary capacities. Many of our members face significant budgetary limitations due to a combination of costs, largely due to PERS rates and healthcare, and Oregon's antiquated and restrictive property tax system which significantly constrains revenue generated for core local services. These challenges hit smaller communities especially hard. In addition, cities face mounting pressures to address the many pressing needs of their communities and to be able to prioritize and fund those needs that have the most significant impact to the lives of our citizens. Housing affordability is a priority for many of our communities and has been indicated as a priority at the state level through the governor's office, state agency efforts and recently passed legislation. The comments below reflect our concerns over the policy and resource conflicts created through competing priorities and policy direction. With that said, we recognize that the Department of Environmental Quality (DEQ) must implement a mercury TMDL and we are not requesting that smaller communities be exempted from having a role. What we are asking is for DEQ to consider a "right-size" approach that accounts for the organizational capacity, financial resources, and technical staffing expertise of small cities.

To better articulate the fiscal challenges of some of the cities that are being required to serve as designated management agencies, the below excerpt is from the Fiscal Year 2018-19 Budget Message document from one of the DMA cities (as listed in Appendix E of the draft TMDL): Excerpt: "…our city has struggled to find the funds to maintain its assets, keep its Water enterprise fund in a positive financial position, and provide services to its citizens. In the last fiscal year, the Council, current management, and staff have worked diligently to strengthen the financial position of the city, complete needed repairs and maintenance on its real properties and infrastructure and provide consistently high level of services to its citizens. …We estimate that the General Fund will receive a total of approximately $369,000 in property taxes for city operations for FY 2018-19." This example is not intended as an argument to exempt small communities from playing a role in desired water quality improvements for mercury. It is intended to highlight that for successful implementation of the proposed requirements, there needs to be a more appropriate, flexible, right-size approach; paired with funding resources to provide needed assistance. Many of the cities that will be financially impacted if the TMDL requirements are approved as drafted are not currently subject to MS4 Phase I or Phase II permitting requirements. Placing excessive requirements on these communities is likely to result in non-compliance. While we do not doubt that these cities will want to be compliant with the requirements, if they do not have the expertise or resource to perform the work being required, it is likely to result in less than desired outcomes for all sides. Section 13.3.1.11.2 describes "the requirements for portions of cities and counties that have stormwater discharges within the Willamette Basin and are not required to have MS4 permit coverage."

Requirement for Illicit Discharge Detection and Elimination (IDDE): "The IDDE program must prohibit non-stormwater discharges into the stormwater conveyance system through enforcement of an ordinance or other legal mechanism, including appropriate enforcement procedures and actions to ensure compliance." o LOC Concerns: This level of enforcement will require staffing resources beyond the existing capacity of many communities. We frequently hear about communities lacking resources to hire

necessary police and public safety personnel and we urge the state to work with cities to help mitigate these impacts. Other states have invested in the outcomes they seek as related to water quality improvements, while Oregon has struggled to fund even basic programmatic and staffing needs for natural resource agencies and functions. We are not disagreeing that water quality improvements are important, and cities already invest significantly in this regard. However, many cities simply do not have funding to continue to meet additional new mandates. Services will need to be shifted, cut or local communities will need to seek additional revenue to implement these requirements. We support ACWA's suggestion to provide a suite of options for smaller cities and counties to consider. A right-size approach would not only be more feasible and help to address resource constraints, but would also likely result in better outcomes, including effective programs and compliance. We believe that meaningful stormwater improvements can occur without overly-prescriptive requirements that will be difficult to deliver on.

Response: DEQ acknowledges the League of Oregon Cities concerns around flexibility for small communities, as well as costs. Cities that have populations of 5,000 people or greater (i.e. 19 cities) will need to implement six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build off their existing stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff also regularly develop workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

J_JL#4: Suggested Change ID #197

Description: WLA - Stormwater - reduction for stormwater is not proportional to impact - regulate other entities instead

Comment: The draft TMDL indicates that estimated mercury loads from all combined, non-permitted urban area stormwater discharges is approximately one percent of the overall load in the Willamette Basin. However, the TMDL requires a 75 percent reduction of mercury loads across this sector, which appears to be weighted beyond the actual impact of the sector. This statement more than any other in the Draft Mercury TMDL demonstrates the de minimis impact such sources potentially contribute. Knowing that 99% of mercury loading is from other sources, it is unreasonable to expect Linn County or any other rural county to create an additional review process, hire additional staff, create a new Mercury monitoring program, enforcement mechanisms, etc.to control something that is not even there. DEQ should regulate other sources of mercury, not stormwater.

Response: Based on public comment, DEQ revised requirements for counties. Counties pose a unique situation in terms of land use and pollutant sources because of a mix of densely populated urban areas with sparsely populated rural areas. Therefore, DEQ developed a more tailored approach for counties to meet load reductions for mercury. Rather than requiring counties to implement the six stormwater control measures, DEQ revised requirements to focus on core management programs related to county-owned lands, properties, facilities and roads. Revising county requirements addresses many of the concerns the commenters expressed.

To further clarify, counties are included with other nonpoint source sectors, such as agriculture and forestry, to meet the aggregated 88% total mercury reduction. The 75% total mercury load reduction required for city stormwater discharges only applies within permit boundaries for those counties with MS4 permits.

As noted in Section 13.3.1.11, environmentally significant concentrations of mercury are found in stormwater from developed areas and, therefore, reductions are needed. In setting allocations, one scenario DEQ considered was to equally apply the 88% reduction to each sector. This is the total reduction needed throughout the basin. As explained in the closing paragraphs of Section 10 in the TMDL, DEQ ultimately considered the disparate impacts from atmospheric deposition, relative contributions, confidence in achieving reductions, and other factors for each sector in assigning allocations. The 75% reduction for the small non-permitted urban stormwater sector aligns with the reductions required from the permitted stormwater sector. In addition, the stormwater control requirements for cities without MS4 permits are less stringent than MS4 permits, and these smaller cities have additional time to comply with each stormwater control measure. DEQ's TMDL is comprehensive in regulating all known sources of mercury, yet also considered the varying levels of effort needed by each sector.

DEQ did not make any changes to the stormwater allocations, but added clarifying language as to where each applies.

J_JL#5: Suggested Change ID #198

Description: TMDL Target - Northern Pikeminnow as standard

Comment: In addition, the LOC again reiterates is support of the ACWA Comments dated August 29, 2019, and specifically would like to echo concerns over the underlying assumptions based on consumption of Northern Pikeminnow. We would like to have additional information regarding the use of this fish species as the water quality standard is based on fish consumption of 175 grams per day (equal to 30, 6-oz servings a month).

Response: The data and analysis used in the development of the TMDL will be available through our website. The selection of the Northern Pikeminnow to calculate the load capacity was not based on the assumption that this fish species is consumed at the rate of 175 grams per day, so DEQ does not have any additional information regarding this. Please see the Margin of Safety section of the TMDL for the rationale for the selection of Northern Pikeminnow.

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69. Comments from: Metz, Eric D. of Oregon Department of State Lands

M_E#1: Suggested Change ID #369

Description: WQMP - DSL will continue implementing strategies identified in Table 13-6

Comment: DSL will continue to implement the management strategies identified in Table 13-6 in order to ensure that all persons applying for, and holding authorizations to use, state-owned land are implementing best management practices that reduce runoff, sediment and erosion.

Response: DEQ agrees that continued implementation of the strategies identified in Table 13-6 will benefit water quality and help to reduce runoff, erosion and sediment movement.

M_E#2: Suggested Change ID #370

Description: WQMP - Questions DSL authority for Table 13.6 management strategies in the Willamette Basin

Comment: What was the source of the information contained in Table 13.6? We can't say that we speak specifically to any of these strategies as part of our proprietary authorizations. We use our standard DOJ approved templates for leases, easements and registrations. Conditions include being in compliance with all other local, state and federal laws; not releasing hazardous materials, keeping structures in a state of good repair; etc. However, we don't have authorizations specific to the Willamette Basin (except for Portland Harbor) or to mercury loading.

Response: The management strategies identified in Table 13-6 were compiled by DEQ staff based on existing knowledge of areas where DSL has the ability to have an impact on mercury and sediment movement in the basin. DEQ provided DSL with a copy of Table 13-6 for review prior to the public comment period in order to confirm that the information regarding DSL's current program was accurate. DSL staff communicated to DEQ that the items presented in Table 13-6 accurately depicted areas where DSL has an impact on management activities that support the implementation if this TMDL. Based on the more recent feedback provided during the public comment period, DEQ revised language in Table 13-6.

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70. Comments from: Simpkins, Sunny of Multnomah County Drainage District

S_SM#1: Suggested Change ID #182

Description: WQMP - Responsible persons - Districts do not qualify as RPs

Comment: In summary, there is no support in the Clean Water Act ("CWA") and Oregon Water Quality statutes for the proposal to regulate "Water Conveyance Systems" as non point sources or as "responsible persons." Even if such legal authority exists, the Districts' operations do not fit within the regulatory scheme of the Proposed TMDL. Therefore, the Districts respectfully request that DEQ remove them from being considered regulated responsible persons, nonpoint sources under the Proposed TMDL.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

S_SM#2: Suggested Change ID #183

Description: General - Comment period too short #2

Comment: Finally, the public review and comment period of the Proposed TMDL is unprecedently short, giving the Districts inadequate time to meaningfully review and respond to the proposal. The Districts reserve the right to submit additional comments.

Response: The initial public comment period for the Willamette Basin Mercury TMDL was 63 days, from July 3, 2019 through September 3, 2019. This exceeds the timeframe suggested in OAR 340-042-0050(2)(b), which states: "The Department will provide notice and an opportunity for public comment on a proposed TMDL or revision to loading capacity or allocations in a TMDL. The public comment period will generally be 60 days." In addition, the public comment period for this TMDL was extended from September 3, 2019 to September 6, 2019, in response to a request from parties representing many of the Designated Management Agencies and Responsible Persons, bring the total comment period to 66 days.

S_SM#3: Suggested Change ID #184

Description: WQMP - Need for dredging - current District WQ Management

Comment: Districts' Flood Management System. The Districts help protect lives and property from flooding by operating and maintaining flood management systems for nearly 13,000 acres of land along the Columbia Slough and the lower Columbia River. The Districts do not withdraw water for landowners' use. Over the course of their history, the Districts' system has evolved into one that primarily provides urban flood management. The Districts maintain 27 miles of levees and 45 miles of surface water conveyance systems, including primary and secondary features, and operate 12 pumping facilities. Surface waters within the Districts include primary water bodies, private water bodies, and secondary ditches. Primary water bodies are the named rivers, lakes, slough, and canals (e.g. Columbia River, Blue Lake, Columbia Slough, and Peninsula Drainage Canal). Private water bodies include ditches and ponds that are not under the jurisdiction of the Districts (e.g. Heron Lakes Golf Course ponds). Secondary ditches are surface water conveyance systems that carry water to the primary water bodies. The Districts operate and maintain the flood management system pursuant to the United States Army Corps of Engineers ("USACE") under Public Law (PL) 84-99 and the National Flood Insurance Program ("NFIP") of the Federal Emergency Management Agency ("FEMA"). Under the regulation and guidelines of USACE's levee safety and FEMA's NFIP, accredited levees must at least meet design, operation, and maintenance standards for the protection against a 1%annual- chance flood. In order to meet these federal levee safety standards and protect lives and properties, in the past, the Districts conducted in-water dredging to remove accumulated sediment an average of every 3 years. As with any in-water work, the

Districts complied with all relevant law. This included the dredge and fill regulatory requirements and permits administer by the USACE and Division of State Lands ("DSL"), 401 Water Quality Certification ("WQC") by DEQ, and the City of Portland Erosion Control Manual. Given the fact that the Columbia Slough and its tributaries are a remedial site subject to a Remedial Action Record of Decision, the Districts' in-water work is not only already regulated, but it also resulted in a net benefit to the environment by removing previously-deposited pollutants from the waterways. The Districts' work complies with an DEQ approved Environmental Management and Testing Plan for Ditch Maintenance (the "EMP"). Given recent evaluations, however, the Districts' need for future dredging is questionable at best.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

S_SM#4: Suggested Change ID #185

Description: WQMP - Water conveyance - Lack of authority to regulate as RPs

Comment: There are several aspects of the Proposed TMDL regulation of Water Conveyance Systems that wholly lack legal support under federal CWA and state water quality law. The Proposed TMDL is based on the CWA. The CWA delegates to the states authority to develop TMDLs based on state water quality standards, which could be more stringent than federal standards. However, the Proposed TMDL's regulation of Water Conveyance Systems as responsible persons, non point sources goes beyond the regulatory jurisdiction of the CWA and the optional stringency a state may have for its water quality program. For the reasons discussed below, DEQ must remove Water Conveyance Systems from being regulated nonpoint sources.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

S_SM#5: Suggested Change ID #186

Description: WQMP - Point of Regulation - No authority to regulate after pollutant enters water

Comment: Federal CWA and state water quality law differ on what types of waterbodies fall under their jurisdiction. The CWA broadly covers all “navigable waters” and “waters of the United States” (collectively “WOTUS11), while state law captures” waters of the state," that are beyond the federal WOTUS, such as groundwater. But, regardless of whether the waterbody is regulated by federal or state law, what remains clear is that the point of regulation is triggered when pollutants first enter the regulated waterbodies. Nothing in the CWA allows a state to implement TMDL water quality regulation to address pollutants that have already been deposited in the regulated waterbody. Yet, DEQ does just that when it determines that “[m]ost of the mercury load from [non point sources] is from atmospheric deposition” and then passes the bulk of the responsibility onto Water Conveyance Entities to address the pollutant depositions by imposing controls for in-water soil erosion and sediment transport. (Proposed TMDL at 64-170). DEQ’s proposed regulatory scheme has no support in the CWA, which requires regulation to occur when pollutants first enter a regulated waterway. Case law on navigable waters and the regulatory history of the WOTUS rule cannot be any clearer on this principle. State water regulations that implement TMDL must also stay within this jurisdictional principle-regulation begins at the point the pollutant enters regulated waterways, not after. Thus, the Districts oppose any effort by DEQ under the Proposed TMDL to broaden the point of regulation because such an expansion is not a type water quality standards that the CWA allows DEQ to have as an enhanced stringency. 40 CFR Part 131.

Response: DEQ agrees that the focus of the CWA and state water quality law is to stop pollution from entering waters of the United States and waters of the state. The CWA requires that TMDLs be developed for water quality limited waterbodies in order to bring the waterbodies into compliance with standards. In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from DMAs and responsible persons must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control. In requiring DMAs and responsible persons to provide plans to change processes, practices or activities and conditions that cause or may cause pollution DEQ is not exceeding its jurisdiction but rather meeting the requirements of state and federal law.

S_SM#6: Suggested Change ID #187

Description: WQMP - Conveyance systems - No authorization to define as NPS

Comment: DEQ’s determination that Water Conveyance Systems are “nonpoint sources”, and therefore are “sources, 11 are also not authorized by law. DEQ describes the role of Water Conveyance Systems as ”sources" and nonpoint sources" as follows: “As noted in OAR 340-042-0040(4)(f) and OAR 340-042-030(12), a source is any process, practice, activity or resulting condition that causes or may cause pollution or the introduction of pollutants to a waterbody. This section identifies the mercury sources and estimates, to the extent existing data allow, the amount of actual mercury loading from existing sources. Sources of mercury to streams include point and nonpoint sources. Specific sources are described below

and are subsequently assigned allocations. By mass, nonpoint sources are the major sources of mercury in the Willamette Basin. 'Nonpoint sources are diffuse or unconfined sources of pollution where wastes can either enter, or be conveyed by the movement of water, into waters of the state' OAR 340-41-0002 (42). 11 (Proposed TMDL at 46-169) (Emphasis added) In so doing, DEQ has to rely solely on the state's regulatory definitions of the "source," and "nonpoint sources" because those terms are not defined under the CWA. CWA regulates pollution by imposing mandates on two categories of sources, "point sources" and "nonpoint sources." CWA defines a "point source" as "any discernible, confined and discrete conveyance,****, from which pollutant are or may be discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture." 33 USC 1362(14) (Emphasis). Courts have found that the term "nonpoint source" is a broad category of other forms of water pollution that do not otherwise fall within the point source definition nor the National Pollutant Discharge Elimination System ("NPDES") permitting program. Nat'/ Wildlife Fed'n v. Gorsuch, 693 F.2d 156, 166 (D.C. Cir. 1982). DEQ's definition of "nonpoint source" does not support its application to Water Conveyance Systems under Proposed TMDL. The definition is limited to pollution being introduced "into" the regulated waterbody, rather than pollution that are already in the regulated waterbody. See, OAR340 41-0002(42) (defining, "Nonpoint Sources" to mean "any source of water pollution other than a point source. Generally, a non point source is a diffuse or unconfined source of pollution where wastes can either enter into waters of the state or be conveyed by the movement of water into waters of the state." (Emphasis added). Yet, DEQ holds Water Conveyance Systems accountable as nonpoint sources on the finding that these systems alter the quantity and timing of sediment-that have already been deposited into the regulated water by some other sources-by delivering it to downstream regulated waterbodies. DE Q's position is not supported by its own regulatory definition as it looks to mandate controls of pollution that are already in the water caused by sources beyond the control of Water Conveyance Systems-e.g., atmospheric deposition. DEQ has more or less admitted to this tenuous legal support in the contradiction of lumping Water Conveyance Systems into the non point source category of the Proposed TMDL: "DEQ's expectation is that all applicable management strategies will be applied to the controllable portions of each source in order to achieve each responsible entity's portion of the aggregated reductions needed. Non point sources are the ones most affected by these mixtures of sources. These were not separated out to identify specific sources within the aggregated allocation. Rather, the broad category captures 'atmospheric deposition' through the source categories described in the TMDL Technical Support Document as 'sediment erosion,' 'surface runoff' and 'atmospheric deposition direct to streams."' (Proposed TMDL at 61-169). Because the Water Conveyance Systems are not "nonpoint sources," they also cannot be "sources" under DEQ's regulation. Atmospheric deposition of mercury is the source of pollution into the regulated waterbody. Merely conveying water (which may contain mercury) between points in a conveyance system does not add or introduce pollution to a regulated waterbody. The case law that leads to and supports the Water Transfer Rule issued by the US Environmental Protection Action, including Catskill Mountains Chapter of Trout Unlimited, Inc. v. EPA, 846 F3d 492, (2d Cir. 2017), provides a clear explanation to why Water Conveyance Systems do not add pollutants into a regulated waterbody. While the Districts acknowledge these legal authorities apply to NPDES point source permitting requirements, the rationale and finding by such a rule and set of cases-that there is no addition of pollutant by water conveyances-is apposite in delineating Water Conveyance System's role as nonpoint "sources." For these reasons, the Districts respectfully rejects the Proposed TM DL categorization of Water Conveyance Systems as "sources" of mercury in the Willamette Basin.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from

sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

DEQ disagrees that water conveyance entities are unable to perform the obligations outlined in the TMDL WQMP. The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

S_SM#7: Suggested Change ID #189

Description: WQMP - Responsible persons - No Authority to Designate Water Conveyance Systems as RPs - Comment 73

Comment: The Proposed TMDL seeks to regulate Designated Management Agencies ("DMAs") and "Responsible Persons." DMAs are defined by DEQ's regulation as "a federal, state or local governmental agency that has legal authority of a sector or source contributing pollutants and is identified as such by the Department of Environmental Quality in a TMDL." OAR 340-042- 0030(2). A regulatory definition for "Responsible Persons" does not exist. At most, "Responsible Persons" are only referenced in relation to DMAs in the establishment of water quality management plans: (G) Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. "(I) Schedule for preparation and submission of sector-specific or source-specific implementation plans by responsible persons, including DMAs, and processes that trigger revisions to these implementation plans." OAR 340-042-0040. (Emphasis added). Yet, in the Proposed TMDL, DEQ deems" [a] responsible person is an entity identified in a TMDL that has responsibility to meet assigned allocations and/or surrogate measures." (Proposed TMDL at 77-169) The regulations tie Responsible Persons to "management strategies," which again, focuses on controlling pollution being added to regulated waterbodies. OAR 340-042-0030(6) (defining "management strategies" as "measures to control the addition of pollutants to waters of the state and includes application of pollutant control practices, technologies, processes, siting criteria, operating methods, best management practices or other alternatives.") (Emphasis added). This definition calls into question DEQ's proposal to hold Water Conveyance Systems accountable for pollutants already in regulated waterbodies.

Response: The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

S_SM#8: Suggested Change ID #191

Description: WQMP - Districts' Operation Falls Outside of Proposed Regulatory Scheme

Comment: Even if DEQ has authority to impose the Proposed TMDL regulatory scheme on the Districts as a non point source, the Districts' operation falls outside of the need for regulation. The Districts' day to day operations in the water generally consists of removing debris and vegetation from culverts or pinch points in the system. Furthermore, the Districts' system is a slow moving, hydraulically flat system that operates like a reservoir, and therefore, natural erosion is limited. Recent hydraulic modeling has indicated that dredging does not significantly impact the conveyance function of the waterways in the Districts Therefore, the Districts infrequently dredge or perform in-water maintenance work. In addition, the conveyance system that the Districts are statutorily required to maintain for flood management is highly vegetated. The presence of vegetation inhibits erosion of the banks. To the extent that the Districts does any sediment in-water work, such work regulated by relevant permitting agencies or DMAs. The in-water work conducted pursuant to the EMP have already applied Best Management Practices (BMPs) that mitigate any downstream sediment transport concerns. First, pursuant to the Proposed TMDL, such Districts' work already meet TMDL requirements: "Water conveyance systems, including those that are managed for irrigation and drainage, are currently regulated by multiple state and federal agencies, including Oregon Water Resources Department, DSL, USACE, and DEQ's 401 water quality certification program. For most waters, a DSL permit is required if a project will involve 50 cubic yards of fill and/ or removal within the ordinary high-water line of a stream; this requirement also applies to some ditches. Projects that require a DSL removal-fill permit may also require a Clean Water Act Section 404 permit from the USACE. ***Implementing the requirements and conditions of these permits and Water Quality Certifications include best management practices that meet the TMDL requirements. For projects and activities that are exempt or not permitted by the agencies and programs shown in Table 13-16, owners and operators of water conveyance systems must implement similar best management practices to reduce sediment and erosion, in order to meet the TMDL requirements." (Proposed TMDL at 107-169) (Emphasis Added). Second, the Districts' EMP ensures against downstream mercury transport by any sediment dredging projects by managing the surface levels and removing contaminants. The EMP provides a comprehensive evaluation framework governing sampling, sediment and soil testing, and test interpretation (disposal guidelines) and how the dredging work is performed. A pre-stipulated level of chemical concentration is reached for the design new surface (leave surface) before the project begins. The design new surface is tested during the maintenance activity, if the chemical concentrations exceed the predetermined level, the Districts cap the design new surface with 6 inches of clean material. Therefore, the Districts' dredging activity leaves the area with lower chemical concentrations than before the dredging occurred. In addition, to minimize disturbance, the EMP details BMPs for the maintenance activity. The BMPs implemented include, but are not limited to: • The Districts maintain compliance with the City of Portland Erosion Control Manual during and after all maintenance project s. • Clearing and grading will be conducted to prevent exposed inactive areas from becoming a source of erosion. • Erosion and sediment control measures including perimeter sediment control will be in place before vegetation is disturbed and will remain in place and be maintained, repaired, and promptly implemented following procedures established for the duration of construction, including protection for active storm drain inlets and catch basins and appropriate non-stormwater pollution controls. • Temporary stabilization will be provided for that portion of the site where construction activities cease for 14 days or more with a covering of blown straw and a tackifier, loose straw, or an adequate covering of compost mulch until work resumes on that portion of the site. • Permanent erosion control measures will be provided on all exposed areas. Temporary sediment control practices will not be removed until permanent vegetation or other cover of exposed areas is established; however, all temporary erosion control measures will be removed as exposed areas become stabilized, unless doing so conflicts with local requirements. Construction materials and waste, including sediment retained by temporary BMPs will be properly disposed. In March 2019, DEQ performed an audit of in-water work performed under the 401 WQC. The

audit concluded that there were no violations and that we met the stipulations of the certification. Given that the Districts have an EMP for any future in-water sediment removal projects and that already identify mitigation against erosion control and sediment transport, the Districts should be removed from the regulation of the Proposed TMDL.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

S_SM#9: Suggested Change ID #193

Description: General - Request for in-person meeting

Comment: For the reasons discussed in this letter, the Districts request that DEQ remove Water Conveyance Systems from the Responsible Persons, nonpoint sources designation, or in the alternative find that the Districts' operations are outside of the Proposed TMDL regulation. In addition, the Districts requests an in-person meeting with DEQ to explain our unique system and how we operate it.

Response: All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin. DEQ will reach out to all responsible persons and offer opportunities to meet in-person after issuance of the TMDL.

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71. Comments from: Bellringer, Holly of U.S. Army Corps of Engineers Portland District, Water Quality Section

B_H#1: Suggested Change ID #186

Description: WQMP - Point of Regulation - No authority to regulate after pollutant enters water

Comment: Federal CWA and state water quality law differ on what types of waterbodies fall under their jurisdiction. The CWA broadly covers all “navigable waters” and “waters of the United States” (collectively “WOTUS11), while state law captures ”waters of the state," that are beyond the federal WOTUS, such as groundwater. But, regardless of whether the waterbody is regulated by federal or state law, what remains clear is that the point of regulation is triggered when pollutants first enter the regulated waterbodies. Nothing in the CWA allows a state to implement TMDL water quality regulation to address pollutants that have already been deposited in the regulated waterbody. Yet, DEQ does just that when it determines that “[m]ost of the mercury load from [non point sources] is from atmospheric deposition” and then passes the bulk of the responsibility onto Water Conveyance Entities to address the pollutant depositions by imposing controls for in-water soil erosion and sediment transport. (Proposed TMDL at 64-170). DEQ’s proposed regulatory scheme has no support in the CWA, which requires regulation to occur when pollutants first enter a regulated waterway. Case law on navigable waters and the regulatory history of the WOTUS rule cannot be any clearer on this principle. State water regulations that implement TMDL must also stay within this jurisdictional principle-regulation begins at the point the pollutant enters regulated waterways, not after. Thus, the Districts oppose any effort by DEQ under the Proposed TMDL to broaden the point of regulation because such an expansion is not a type water quality standards that the CWA allows DEQ to have as an enhanced stringency. 40 CFR Part 131.

Response: DEQ agrees that the focus of the CWA and state water quality law is to stop pollution from entering waters of the United States and waters of the state. The CWA requires that TMDLs be developed for water quality limited waterbodies in order to bring the waterbodies into compliance with standards. In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from DMAs and responsible persons must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control. In requiring DMAs and responsible persons to provide plans to change processes, practices or activities and conditions that cause or may cause pollution DEQ is not exceeding its jurisdiction but rather meeting the requirements of state and federal law.

B_H#2: Suggested Change ID #327

Description: Editorial - Impoundments - p51 Draft TMDL

Comment: page 51 of the draft TMDL. The sentence below Table 9-2, appears to refer to North Santiam River as a tributary to Green Peter Reservoir instead of Detroit Reservoir.

Response: DEQ agrees with this comment and has made this change.

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72. Comments from: Moffett, Sharla of Oregon Business & Industry

M_SO#1: Suggested Change ID #178

Description: WQMP - Conveyance entities - How to separate sedimentation resulting from conveyance systems from that resulting from upland agricultural activities

Comment: Specific to impacts due to modeling used in the load allocations impacting our members, it is worth noting that while DEQ states water conveyance entities "are responsible only for sedimentation resulting from conveyance systems, not from upland agricultural activities," it is unclear how this separation will be made since there is no data allocating mercury to alleged water conveyance activities versus upland agricultural activities. We are concerned this approach may lead to conflict between the named entities, stymieing the types of collaborative partnerships and projects needed to make real progress in improving Oregon's water quality.

Response: DEQ is not requiring water conveyance entities to conduct water quality monitoring at this time, however they will be responsible for submitting TMDL implementation plans to DEQ that clearly show best management practices are/ will be utilized to reduce erosion and sediment movement during operation and maintenance of the system. Water conveyance entities that fully implement their DEQ-approved TMDL implementation plan will be considered to be in compliance with the TMDL.

In addition, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under authority or control by DMAs or responsible person, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

M_SO#2: Suggested Change ID #195

Description: WQMP - Stormwater - six minimum measures will burden small communities, funding and resources needed

Comment: Delete or reduce TMDL requirements for small cities and counties in consideration of lack of staff and resources to implement measures to reduce nonpoint source mercury in undeveloped areas. Or consider meeting to explore funding technical assistance opportunities for small communities to support implementation of TMDL requirements for nonpoint source mercury reduction.

Response: DEQ acknowledges the commenters' concerns around lack of staff and resources to reduce nonpoint sources of mercury in small communities. In response, DEQ revised the WQMP by removing the six stormwater control measures from county requirements. Instead, DEQ developed a tailored approach specific to county circumstances.

DEQ continues to support requirements for cities that have populations of 5,000 people or greater (there are 19 cities that have populations of 5,000 or greater) to implement the six stormwater control measures. Some of these cities have already been implementing stormwater control measures that DEQ required in the 2006 Willamette Basin TMDL, so these communities will continue to build on their stormwater program. For cities between 5,000 and 10,000, several of the stormwater control measures that address construction and post-construction requirements will have up to 9 1/2 years to be implemented. Small cities will have up to 4 1/2 years to fully implement an IDDE program. DEQ anticipates that these timeframes will allow even small cities to train staff, develop specific program elements and obtain needed funding to implement a stormwater control program. In addition, DEQ basin coordinators will be working closely with these cities as they develop new or revised TMDL implementation plans to meet mercury reductions over time. DEQ staff regularly facilitate workshops that provide technical assistance and guidance for small DMAs. DEQ intends to offer workshops focusing on meeting TMDL requirements following the issuance of the TMDL.

M_SO#3: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and

identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

M_SO#4: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

M_SO#5: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about

how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

M_SO#6: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg

methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

M_SO#7: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

M_SO#8: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the

concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

M_SO#9: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software

package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

M_SO#10: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

M_SO#11: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

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73. Comments from: Rolfe, Mike of Creswell Water Control District

R_MCW#1: Suggested Change ID #33

Description: WQMP - Responsible persons - Remove or add entity to the TMDL as a responsible person

Comment: Remove or add entity to the TMDL as a responsible person

Response: The Creswell Water Control District has jurisdiction to operate water flow from a drainage system that discharges to the Coast Fork Willamette River, a major tributary to the Willamette River.

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74. Comments from: Snell, April of Oregon Water Resources Congress (OWRC) and the Oregon Farm Bureau (OFB)

S_A#1: Suggested Change ID #111

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #1

Comment: We are concerned the lack of clarity and potential negative impacts related to the role of irrigation districts and similar entities in implementing water quality standards will lead to increased conflict and costly litigation rather than collaborative partnerships necessary to achieve measurable water quality improvements.

Response: DEQ must address the elements of a TMDL described in OAR 340-042-0040 (4) (a-l) in order to meet the rule as well as to attain approval from EPA. One of the elements required in a TMDL is, "Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing management strategies and developing and revising sector-specific or source-specific

implementation plans," (OAR 340-042-0040 (4) (G). DEQ has authority to identify persons responsible for implementing the TMDL, which includes but is not limited to DMAs. DEQ uses the term "responsible persons," to identify "persons…responsible for implementing management strategies and developing and revising sector-specific or source-specific implementation plans."

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_A#2: Suggested Change ID #114

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #2

Comment: OWRC represents some, but not all, of the irrigation districts, water control districts, water improvement districts, drainage districts, and other similar entities listed as "water conveyance entities" in the proposed TMDL. Many of OFB's members are members or operators of the aforementioned irrigation and drainage districts. We are supportive of achievable and implementable water quality standards in the Willamette Basin and throughout Oregon, and recognize that DEQ is under stringent, court-ordered deadlines for implementing TMDLs. However, the inclusion of our members as RPs is highly problematic as this new term lacks statutory authority and clarity as to what districts would be responsible for, which unnecessarily and inappropriately places liability on districts and increases the risk of litigation. The lack of clarity also reduces the likelihood that TMDL load allocations will ever be attained.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from

sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_A#3: Suggested Change ID #117

Description: Editorial - “Responsible person” term not well defined

Comment: The proposed Willamette Basin Mercury TMDL and associated WQMP utilizes the term “Responsible Persons” (RPs), which appears to be a new term that is undefined under either Oregon statute or rule, with uncertain meaning and tremendous potential for legal liability. While DEQ has stated RPs are not Designated Management Agencies (DMAs), the draft TMDL lists water conveyance entities as a “DMA category” (see Appendix E), thereby creating additional uncertainty over what this term means and what implications it has for districts. We agree irrigation districts are not DMAs, which are defined in OAR 340-042-0030(2) as entities “that [have] legal authority of a sector or source contributing pollutants.” However, it is unclear what the legal distinction and potential liabilities are in implementing TMDLs as an RP versus a DMA.

Response: DEQ agrees that the column header in the table shown in Appendix E is inaccurate and the column header was revised to reflect responsible persons as well as Designated Management Agencies.

In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons

identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

S_A#4: Suggested Change ID #172

Description: WQMP - Conveyance entities - lack of clarity about responsibilities of RPs #3

Comment: The inclusion of irrigation districts, drainage districts, and similar agricultural water suppliers as generic "water conveyance entities" also fails to acknowledge the separate and distinct statutory authorities and responsibilities of each type of entity. There are significant differences in not only the authorities, but the specific purposes for which different districts were formed under ORS chapters 545, 547, 552, 553, and 554. For example, irrigation districts are formed most commonly by a group of farmers for the purpose of delivering water to farms and other agricultural water users. Drainage districts are similarly formed by a group of farmers for the purposes of delivering water away from farms. In either circumstance, our members manage the conveyance of water and have limited or no control over the quality of the water they receive or deliver. While we do not represent all of the entities listed, we are not aware of any information that justifies any of the forty-seven entities being listed as RPs without further clarification.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine

implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_A#5: Suggested Change ID #173

Description: WQMP - Entities lack statutory authority, which also means reasonable assurance is not met

Comment: Irrigation districts, drainage districts, and similar entities generally lack statutory authority to manage the quality of the water they deliver. They are responsible for performing certain water management functions for their assessed district patrons, most commonly operations and maintenance of water delivery infrastructure. These entities are responsible for managing and conveying a quantity of water and are generally not responsible for, nor do they have the statutory authority, to manage the quality of the water they deliver. Districts lack both the authority and resources to implement water quality measures for mercury or other pollutants. There are currently no methods, resources, or authority for districts to reduce mercury in water. Not only do irrigation districts, drainage districts, and similar entities lack authority to manage water quality, they also lack statutory authority to compel compliance by member patrons and are not responsible for the land management activities of individual water users within districts. In the Willamette Basin and throughout Oregon, districts regularly engage with their local Soil and Water Conservation Districts(SWCDs). They provide their water users with information and resources available from local SWCDs as well as the Natural Resources Conservation Services (NRCS). However, districts are generally not legally authorized, nor possess the financial means, to implement or enforce water quality improvement measures upon the individual farmers within their districts, and not all of them have the requisite knowledge and experience to convey information about these programs to their patrons.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to

provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_A#6: Suggested Change ID #174

Description: WQ Impairments - No evidence that district activities contribute to mercury in basin

Comment: There is no evidence that district activities directly contribute to mercury loads and therefore are unlikely to have any impact on the amount of mercury in the Willamette Basin.

Response: DEQ acknowledges that the TMDL does not include data specific to water conveyance entities. In other words, there are no system- specific data available to support inclusion or exclusion of water conveyance entities from the TMDL. An important element of this TMDL is to at a minimum identify where these systems exist on the landscape and what maintenance and operations activities are implemented within these systems. This represents progress toward a better understanding of the potential impact of water conveyance systems on water quality. DEQ identified these entities as responsible persons because of their process, practice, activity or resulting condition may contribute mercury.

S_A#7: Suggested Change ID #175

Description: WQMP - DMA designation

Comment: It is appropriate for the Oregon Department of Agriculture (ODA) to be listed as a DMA and to continue implementing the Agricultural Water Quality Management Program (under SB 1010) within districts. ODA's program ensures there is clarity for individual farmers and ranchers on what requirements need to be followed and what steps can be taken to achieve compliance. Under ORS 568.930, landowners within boundaries of water quality management area plans are already required to comply with plan rules, regardless of whether they are receiving water from an irrigation district or similar entity and are subject to penalties if they do not comply. ODA has educational tools and technical assistance to provide landowners and operators to help resolve water quality issues. ODA also has the authority to take enforcement action against landowners and operators who do not voluntarily comply with water quality standards, implementation plans, and related area rules. Oregon farmers are doing what they are required to do in the individual river basin plans.

Response: DEQ agrees that ODAs agricultural water quality program is helping to ensure TMDL implementation related to agricultural activities and farming practices.

S_A#8: Suggested Change ID #176

Description: WQMP - Funding of RPs

Comment: In addition to the lack of clarity and authority, irrigation districts and similar entities do not have resources to implement the proposed TMDL and related WQMP. Many of the proposed RPs are small districts with little or no paid staff. These small entities lack the financial resources and management structure to implement the proposed WQMP, increasing the likelihood of non-compliance. Even entities with staff struggle with understanding what role their particular district has in addressing mercury TMDL allocations. Our organizations remain committed to conducting outreach and education to our respective members, but we are extremely concerned about the potential unfunded regulatory burden being placed on these entities.

Response: DEQ acknowledges the fiscal impact to all entities responsible for implementing the TMDL. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to coordinate and collaborate on implementation in order to improve implementation efficiency as well as reduce/ share costs when feasible.

S_A#9: Suggested Change ID #177

Description: WQ Impairments - Source of mercury

Comment: In the proposed TMDL, DEQ acknowledges the lack of information about water conveyance entities' impacts regarding mercury and would appear to be requesting more information about operations so that it can further regulate entities that may not have any control over the amount of mercury entering or returning to waterways in the Willamette Basin. While DEQ staff have asked districts to provide detailed descriptions of their water conveyance systems under the auspices that it would lead to being excluded as an RP, such information is unlikely to be provided due to potential liabilities and safety concerns associated with such descriptions being accessible online. Coupled with the lack of clarity over what the role of an RP is in the first instance, we are concerned that information provided in good faith will be used create more onerous and unattainable allocation reduction burdens for individual districts, in addition to only fueling more litigation.

Response: An important element of this TMDL is to at a minimum identify where these systems exist on the landscape and what maintenance and operations activities are implemented within these systems. This represents progress toward a better understanding of the potential impact of water conveyance systems on water quality. It is important to obtain system- specific information in order to implement the TMDL as well as address other concerns stated by OWRC, i.e. a lack of system- specific data in the TMDL.

S_A#10: Suggested Change ID #178

Description: WQMP - Conveyance entities - How to separate sedimentation resulting from conveyance systems from that resulting from upland agricultural activities

Comment: Specific to impacts due to modeling used in the load allocations impacting our members, it is worth noting that while DEQ states water conveyance entities "are responsible only for sedimentation resulting from conveyance systems, not from upland agricultural activities," it is unclear how this

separation will be made since there is no data allocating mercury to alleged water conveyance activities versus upland agricultural activities. We are concerned this approach may lead to conflict between the named entities, stymieing the types of collaborative partnerships and projects needed to make real progress in improving Oregon's water quality.

Response: DEQ is not requiring water conveyance entities to conduct water quality monitoring at this time, however they will be responsible for submitting TMDL implementation plans to DEQ that clearly show best management practices are/ will be utilized to reduce erosion and sediment movement during operation and maintenance of the system. Water conveyance entities that fully implement their DEQ-approved TMDL implementation plan will be considered to be in compliance with the TMDL.

In addition, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under authority or control by DMAs or responsible person, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

S_A#11: Suggested Change ID #179

Description: WQMP - Responsible persons - Clarify responsibility of RPs

Comment: In summation, OWRC and OFB appreciate DEQ's ongoing efforts to protect Oregon's water quality, but we have significant concerns about the proposed implementation approach. Placing additional unclear and unfunded mandates upon irrigation districts and similar entities will only lead to additional conflict and litigation rather than improved conditions. We continue to be supportive of irrigation districts and similar entities actively participating in collaborative, basin-wide efforts through local SWCDs and working with appropriate DMAs like ODA. While a long-term solution is needed, at the very least, we urge you to clarify that irrigation districts and similar entities are not responsible for developing or implementing water quality management plans related to activities not within their scope of operations, control, or legal management authority. Your time and consideration of our comments is greatly appreciated.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals

and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

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75. Comments from: VanNatta, Kathryn of Northwest Pulp and Paper Association

VN#1: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most

conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

VN#2: Suggested Change ID #246

Description: TMDL Target - Northern Pikeminnow

Comment: Target Fish Species: The District continues to have concerns with the use of the Northern Pikeminnow as the target fish species in the TMDL, particularly around communication to the public. Unfortunately, the primary message to the public is likely to be that fish in the Willamette River are highly contaminated and should not be consumed, which is not an accurate or appropriate message. To convey a more accurate picture of fish consumption considerations in the Willamette River basin, DEQ should reconsider the use of a fish that is not widely consumed. Additionally, the use of the Northern Pikeminnow as the target fish species establishes an unrealistic goal for the TMDL. DEQ should use more

widely consumed fish to provide more meaningful and realistic shorter-term goals for in-stream mercury concentrations, perhaps with longer term targets for other fish.

Response: Commenter is referred to the discussion of the Northern Pikeminnow in Section 11 Margin of Safety for justification of its selection.

VN#3: Suggested Change ID #345

Description: General - 2006 Mercury TMDL phased in approach resulted in a much larger data set and an improved scientific foundation

Comment: In the prior 2006 Mercury TMDL, NWPPA supported a "phased approach" with adaptive management by the Department. NWPPA believes the phased approach and additional mercury monitoring has resulted in a much larger data set and an improved scientific foundation for this revised TMDL.

Response: DEQ agrees with the comment.

VN#4: Suggested Change ID #346

Description: General - support for TMDL scientific foundation

Comment: NWPPA supports the TMDL's scientific foundation that in-stream mercury pollution comes from a variety of sources with a majority of the mercury load contributions from air deposition sources outside the Willamette Basin and that the science of mercury methylation is still evolving.

Response: DEQ appreciates the comment in support of the scientific foundation applied in development of the TMDL.

VN#5: Suggested Change ID #347

Description: General - support for pollution prevention and minimization approach

Comment: NWPPA supports the TMDL's pollution prevention and minimization approach, similar to other mercury TMDLs across the nation, to comply with Oregon's exceptionally stringent methylmercury fish tissue water quality criterion of 0.040 mg/kg (wet weight). Discussion: NWPPA believes both point and non-point source contributors should be regulated via the TMDL and Water Quality Management plan through pollution prevention and minimization best management practices, to the extent practicable, by the Department or designated management agency.

Response: DEQ appreciates the comment in support of DEQ's pollution prevention and minimization approach. As demonstrated by the required actions described in the TMDL, DEQ agrees that both nonpoint source and point source actions are needed to collectively improve water quality in the Willamette Basin.

VN#6: Suggested Change ID #348

Description: General - TMDL is highly protective of beneficial use

Comment: NWPPA believes that the TMDL's conservative policy decisions and modeling assumptions, combined with an aggressive approach to pollutant prevention and minimization result in a TMDL that is very highly protective of the most sensitive beneficial use of fish consumption in addition to being highly protective of all other designated beneficial uses of waters in the Willamette Basin.

Response: DEQ appreciates the comment in support of the TMDL's protection of beneficial uses.

VN#7: Suggested Change ID #349

Description: WLA - support for aggregate 10 percent reduction

Comment: NWPPA supports the aggregate 10 percent reduction total mercury target for National Pollution Discharge Elimination System (NPDES) permits with the proposed narrative waste load allocation approach for point source total mercury reductions to the extent practicable under DEQ's wastewater permit program Discussion: NWPPA believes the 10 percent aggregate reduction of total mercury per day for all point source water permit holders is appropriate given that: 1) industrial point sources in the Willamette Basin provide 0.3 percent of the total load for mercury to the Willamette; 2) all permitted point source dischargers (NPDES and stormwater) comprise approximately 4 percent of the total mercury load; 3) the applicable water quality criterion is a methylmercury fish tissue criterion; and, 4) scientific knowledge of the Willamette Basin methylation processes are still evolving.

NWPPA strongly supports the Department's conclusion in the TMDL Draft for Public Comment, dated July 3, 2019, on page 66, "As discussed in the TMDL Technical Support Document, deposition of mercury…The waste load allocations that follow meet the intent of individual allocations by requiring site - specific permit requirements and monitoring with enforceable conditions, such that individual site reductions will be completed and will cumulatively add up to the aggregate percent reduction requirements by sector set by the TMDL."

Response: DEQ appreciates the comment in support of the aggregated wasteload allocation approach.

VN#8: Suggested Change ID #350

Description: Reserve Capacity - use should be allowed without additional regulatory restrictions

Comment: NWPPA believes the implicit Margin of Safety is appropriate and the use of the Reserve Capacity for future point source growth/expansion should be allowed without additional regulatory restrictions because the TMDL's conservative policy choices are highly protective of beneficial uses. These highly conservative policy choices, modeling assumptions and mercury transportation assumptions are used throughout the Food Web Model, Mass Balance and Translator models as noted in the TetraTech Technical Support Document. Discussion: NWPPA is concerned with the compounded conservatism of the policy choices and assumptions used in the models leading to overly conservative outcomes and unduly stringent regulatory approaches. Mercury load reduction efforts should be common sense

minimization efforts similar to other TMDLs across the nation, to the extent practicable, given that the majority of mercury loading comes from air deposition.

Response: DEQ generally agrees with the comment. DEQ clarifies that "additional regulatory restrictions" are not proposed in the TMDL for use of reserve capacity for new or expanded point sources. Rather, Section 12 states that allocation of a portion of the 1% reserve capacity requires prior "demonstration of effluent condition and implementation of DEQ approved mercury minimization measures," which are the same requirements applied to implementation of the wastewater and stormwater aggregated point source sector wasteload allocations.

VN#9: Suggested Change ID #351

Description: WQMP - implementation should focus on adaptive management and best management practices already in place

Comment: NWPPA believes the future implementation activities by DEQ and Designated Management Agencies should focus on pollution prevention as regulatory agencies make policy decisions implementing the TMDL and Water Quality Management Plan. Suggested Remedy: The Department and Designated Management Agencies should focus on adaptive management and allow best management practices already in place designed to reduce anthropogenic mercury loads. The draft TMDL on page 66 addresses that fact that additional analysis reduced the estimated amount of total mercury contributed by point sources in the 2019 draft TMDL from the prior 2006 TMDL.

Response: As noted in Section 13.6, DEQ intends to apply adaptive management principles toward achievement of TMDL goals, informed by the monitoring and evaluation strategy. DEQ clarifies that the referenced statements on page 66 were not conclusions that management actions have resulted in reduced mercury loads in the basin since the 2006 TMDL. Rather, the revised evaluations were more robust and included more data, which allowed for more accurate estimates of mercury loads. The current estimated loads from municipal and industrial point sources are lower than the 2006 estimates, but this does not necessarily indicate loads from these sources were reduced due to application of management measures since 2006. Additional analysis and information is needed for evaluating the effects of implementation on mercury in the basin. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

VN#10: Suggested Change ID #352

Description: WQMP - adaptive management approach

Comment: NWPPA believes the Department should continue to leverage new scientific findings to objectively consider whether reducing total mercury has a linear effect on reducing methylmercury in fish tissue in Willamette Basin fish species and whether the very low proposed modeled target of 0.14 ng/L of instream total mercury can be met. This information (or lack of information) should also be considered when determining the length of time needed to comply with the water quality criterion.

Response: Thank you for your comment. DEQ plans to use adaptive management during implementation of the TMDL and will integrate new scientific understanding into the process. Use of adaptive management is briefly described in section 13.1.2 of the WQMP.

VN#11: Suggested Change ID #353

Description: WQMP - fact check DEQ's assumptions by analyzing methylmercury in fish tissue

Comment: NWPPA believes the Department should continue to leverage new scientific findings to objectively consider whether reducing total mercury has a linear effect on reducing methylmercury in fish tissue in Willamette Basin fish species and whether the very low proposed modeled target of 0.14 ng/L of instream total mercury can be met. This information (or lack of information) should also be considered when determining the length of time needed to comply with the water quality criterion.

Suggested Remedy: The Department's assumptions for mercury reductions must be fact checked during TMDL implementation by analyzing methylmercury in fish tissue. Measuring methyl mercury in fish tissue is the correct evaluation factor for complying with the water quality criteria under the Clean Water Act. Without a significant breakthrough in the mechanistic understanding of the factors controlling methylation in the ambient environment there is no remedy to the relationship dilemma between total and methyl mercury. Significant scientific questions remain, including what is the spatial distribution of methylation and does methylation follow temporal (e.g., seasonal) patterns? As the science of mercury methylation processes and mercury transport expands, the Department should use adaptive management for monitoring and adjust the TMDLs best management practices for pollution minimization accordingly.

Response: Thank you for your comment. DEQ will conduct monitoring during implementation to not only measure progress to improving total mercury levels in the water and methylmercury concentration in fish tissue, but will also work with partners and DMAs to conduct studies to better represent the processes influencing methylmercury in fish tissue in the Willamette Basin. DEQ is working with EPA to develop a draft Assessment and Monitoring Strategy that could provide this information. DEQ will work with DMAs for refinement of the draft Strategy and its implementation.

VN#12: Suggested Change ID #354

Description: Source Assessment PS - WLA mercury loading values

Comment: The Department uses literature values for some point source and non-point source mercury loading values. Suggested Remedy: As future monitoring yields additional mercury loading data, the Department must use adaptive management and adjust accordingly the TMDLs best management practices for pollution minimization.

Response: Thank you for your comment. DEQ plans to use adaptive management during implementation of the TMDL. Use of adaptive management is briefly described in section 13.1.2 of the WQMP.

VN#13: Suggested Change ID #355

Description: TSS - request for written response on plans for future scientific study and baseline variation of TSS

Comment: NWPPA objects the use of Total Suspended Solids (TSS) as a surrogate for measuring mercury and the possible unintended consequences of using TSS as a surrogate for mercury transportation over land into water. NWPPA questions the level of current scientific knowledge regarding: 1) TSS transport contributing to in-stream concentrations of total mercury; 2) the relationship of TSS to methylation processes; and 3) whether a linear cause-and effect relationship exists between TSS and methyl mercury concentrations in Willamette Basin fish tissue.

Discussion: NWPPA has concerns with the reliance on TSS as a surrogate for measuring compliance with methyl mercury reductions in fish tissue. NWPPA questions the scientific relationship between TSS as a surrogate for total mercury transport from land into the Willamette river system. NWPPA believes the scientific relationship is unproven between TSS transport contributing to total mercury loading in the Willamette Basin and the assumption is also unproven that reductions of TSS will result in attainment in the near future of the methylmercury fish tissue water quality criterion. DEQ has already reduced Total Suspended Solid (TSS) benchmarks in 1200-Z Industrial Stormwater Permits in the 2017-2018 permit revision. While we agree TSS reduction is a regulatory tool to reduce soil transport into a river system, the relationship and timing between TSS load reductions resulting in reductions to methylmercury reductions in fish tissue remains unproven.

Suggested Remedy: NWPPA asks for a written response regarding the Department's plans for future scientific study and baseline validation of TSS as it relates to total mercury transport into river systems and the scientific relationship of TSS reductions contributing to attainment of the 0.040 mg/kg (wet weight) methylmercury water quality criterion.

Response: DEQ clarifies that DEQ is not proposing to use TSS as a surrogate for direct measure of total mercury transport "over land and into water," in relation to methylation rates or in fish tissue. Rather, DEQ established TSS targets as a surrogate to supplement and not supplant other measures for evaluating the effectiveness of TMDL implementation in achieving total mercury reductions. DEQ revised Section 10.3 in light of this and other comments.

VN#14: Suggested Change ID #356

Description: TSS Surrogate - clarification of surrogate compliance and 1200Z permits

Comment: NWPPA asks that facilities with 1200-Z Industrial Stormwater permits be able to prove compliance with the TMDL's proposed TSS surrogate for methylmercury in fish tissue by alternative compliance methods until the relationship between TSS and mercury has been scientifically evaluated. Suggested Remedy: NWPPA is concerned and questions the level of scientific knowledge of TSS loading contributing to exceedances of methylmercury fish tissue criterion and asks for further scientific study to establish a surrogate relationship between TSS loading and methylmercury in Willamette Basin fish tissue

Response: DEQ clarifies that the TMDL TSS surrogate is not being applied as a compliance point in NPDES permits. Rather, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL

water column target described in this section. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. DEQ revised Section 10.3 and Appendix H in response to this and other comments regarding the TSS surrogate.

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76. Comments from: Stevenson, Brent of Santiam Water Control District

S_B#1: Suggested Change ID #114

Description: WQMP - Conveyance districts - lack of clarity about responsibilities of RPs #2

Comment: OWRC represents some, but not all, of the irrigation districts, water control districts, water improvement districts, drainage districts, and other similar entities listed as "water conveyance entities" in the proposed TMDL. Many of OFB's members are members or operators of the aforementioned irrigation and drainage districts. We are supportive of achievable and implementable water quality standards in the Willamette Basin and throughout Oregon, and recognize that DEQ is under stringent, court-ordered deadlines for implementing TMDLs. However, the inclusion of our members as RPs is highly problematic as this new term lacks statutory authority and clarity as to what districts would be responsible for, which unnecessarily and inappropriately places liability on districts and increases the risk of litigation. The lack of clarity also reduces the likelihood that TMDL load allocations will ever be attained.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to

provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_B#2: Suggested Change ID #117

Description: Editorial - "Responsible person" term not well defined

Comment: The proposed Willamette Basin Mercury TMDL and associated WQMP utilizes the term "Responsible Persons" (RPs), which appears to be a new term that is undefined under either Oregon statute or rule, with uncertain meaning and tremendous potential for legal liability. While DEQ has stated RPs are not Designated Management Agencies (DMAs), the draft TMDL lists water conveyance entities as a "DMA category" (see Appendix E), thereby creating additional uncertainty over what this term means and what implications it has for districts. We agree irrigation districts are not DMAs, which are defined in OAR 340-042-0030(2) as entities "that [have] legal authority of a sector or source contributing pollutants." However, it is unclear what the legal distinction and potential liabilities are in implementing TMDLs as an RP versus a DMA.

Response: DEQ agrees that the column header in the table shown in Appendix E is inaccurate and the column header was revised to reflect responsible persons as well as Designated Management Agencies.

In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

S_B#3: Suggested Change ID #173

Description: WQMP - Entities lack statutory authority, which also means reasonable assurance is not met

Comment: Irrigation districts, drainage districts, and similar entities generally lack statutory authority to manage the quality of the water they deliver. They are responsible for performing certain water management functions for their assessed district patrons, most commonly operations and maintenance of water delivery infrastructure. These entities are responsible for managing and conveying a quantity of water and are generally not responsible for, nor do they have the statutory authority, to manage the quality

of the water they deliver. Districts lack both the authority and resources to implement water quality measures for mercury or other pollutants. There are currently no methods, resources, or authority for districts to reduce mercury in water. Not only do irrigation districts, drainage districts, and similar entities lack authority to manage water quality, they also lack statutory authority to compel compliance by member patrons and are not responsible for the land management activities of individual water users within districts. In the Willamette Basin and throughout Oregon, districts regularly engage with their local Soil and Water Conservation Districts (SWCDs). They provide their water users with information and resources available from local SWCDs as well as the Natural Resources Conservation Services (NRCS). However, districts are generally not legally authorized, nor possess the financial means, to implement or enforce water quality improvement measures upon the individual farmers within their districts, and not all of them have the requisite knowledge and experience to convey information about these programs to their patrons.

Response: In establishing a TMDL, OAR 340-042-0040(4)(l)(G) states that DEQ will include a WQMP that includes: identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans. This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. Implementation plans from sources must provide plans to reduce pollutant loading, not to remedy pollution that the source does not contribute or control.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system. DEQ agrees that management activities already regulated for the protection of water quality, for example dredge and fill permits administered by the USACE and DSL which have a DEQ 401 Water Quality Certification, will comply with this TMDL.

DEQ agrees that collaborative partnerships are an important component of TMDL implementation; specifically, DEQ identifies in section 13.3.1.21 our commitment to collaborating with Oregon Department of Agriculture and Oregon Water Resources Congress to conduct outreach and education over the next two years to water conveyance entities. These outreach and education efforts will help to provide additional clarity about TMDL requirements for responsible persons. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to work with DEQ to coordinate implementation planning efforts over the next two years and then to remain implementation partners moving forward.

All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the characteristics of each system. DEQ believes this tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

S_B#4: Suggested Change ID #175

Description: WQMP - DMA designation

Comment: It is appropriate for the Oregon Department of Agriculture (ODA) to be listed as a DMA and to continue implementing the Agricultural Water Quality Management Program (under SB 1010) within districts. ODA's program ensures there is clarity for individual farmers and ranchers on what requirements need to be followed and what steps can be taken to achieve compliance. Under ORS 568.930, landowners within boundaries of water quality management area plans are already required to comply with plan rules, regardless of whether they are receiving water from an irrigation district or similar entity and are subject to penalties if they do not comply. ODA has educational tools and technical assistance to provide landowners and operators to help resolve water quality issues. ODA also has the authority to take enforcement action against landowners and operators who do not voluntarily comply with water quality standards, implementation plans, and related area rules. Oregon farmers are doing what they are required to do in the individual river basin plans.

Response: DEQ agrees that ODAs agricultural water quality program is helping to ensure TMDL implementation related to agricultural activities and farming practices.

S_B#5: Suggested Change ID #176

Description: WQMP - Funding of RPs

Comment: In addition to the lack of clarity and authority, irrigation districts and similar entities do not have resources to implement the proposed TMDL and related WQMP. Many of the proposed RPs are small districts with little or no paid staff. These small entities lack the financial resources and management structure to implement the proposed WQMP, increasing the likelihood of non-compliance. Even entities with staff struggle with understanding what role their particular district has in addressing mercury TMDL allocations. Our organizations remain committed to conducting outreach and education to our respective members, but we are extremely concerned about the potential unfunded regulatory burden being placed on these entities.

Response: DEQ acknowledges the fiscal impact to all entities responsible for implementing the TMDL. DEQ encourages OWRC, their members, other water conveyance entities and watershed partners to coordinate and collaborate on implementation in order to improve implementation efficiency as well as reduce/ share costs when feasible.

S_B#6: Suggested Change ID #377

Description: Allocations - TMDL does not distinguish the load allocations for water conveyance entities from upland agricultural activities so compliance cannot be determined

Comment: Remove water conveyance entities as responsible persons.

Response: All water conveyance entities named as responsible persons in the TMDL are required to implement the TMDL. Over the next two years DEQ will work directly with responsible persons to determine implementation planning and reporting requirements using available information about the

characteristics of each system. This tailored approach will help to better define implementation strategies and goals that include the varied attributes of water conveyance systems in the basin.

The TMDL WQMP requires water conveyance entities to implement management strategies and actions that are specific to the parts of the system that are owned and/ or operated by the water conveyance entity, for example implementation of best management practices to reduce sediment movement when canals and ditches are cleaned or dredged. Water conveyance entities have the legal ability to implement best management practices that pertain to maintenance activities on their system.

DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems compared to upland ag activities, however this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

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77. Comments from: Williams, Travis of Willamette Riverkeeper

W_TW#1: Suggested Change ID #335

Description: General - Support for TMDLs approach to control transport of mercury regardless of original source

Comment: This is an important step to reduce the presence of methyl mercury in the Willamette River system. It is also refreshing that the discussion has been more about limiting the transport of mercury from a variety of sources, rather than being bogged down by the notion that various sectors did not "create" the mercury and do not view themselves as "sources."

Response: DEQ appreciates the comment in support of the comprehensive approach.

W_TW#2: Suggested Change ID #336

Description: General - TMDL approach is sufficient

Comment: We believe the modeling and the overall analytical approach by DEQ and its contractor are sound based on multiple interactions during the development of the Draft TMDL.

Response: DEQ agrees that EPA's contractor used scientifically sound methods and the technical approach was enhanced by including significantly more data compared to the 2006 TMDL.

W_TW#3: Suggested Change ID #337

Description: Source Assessment - Agree with methodology and findings that majority is NPS

Comment: With 94% of methylmercury coming from non point sources, there is much to do to limit runoff that carries mercury into our river system - from forestry, agriculture, and urban areas. Municipalities also have an important role.

Response: DEQ agrees that reducing mercury and sediment inputs from nonpoint sources, including forestry, agriculture, and urban areas, is critical to successful implementation of this TMDL. DEQ believes that developing measurable objectives and milestones for forestry and agriculture, as well as requiring six stormwater control measures for all urban DMAs with population greater than 5,000 people, will result in a measurable impact on water quality in the basin.

W_TW#4: Suggested Change ID #338

Description: Source Assessment - Landuse assessment is appropriate for determining loads from source sectors

Comment: The Land Use assessment for the Willamette Basin, while not perfect, is appropriate for determining the various sectors of land use and related runoff of methyl mercury into the Willamette River system.

Response: DEQ appreciates this comment in support of the Land Use assessment.

W_TW#5: Suggested Change ID #339

Description: WQMP - Municipalities have key role in implementation and deferral of full implementation actions should be considered carefully

Comment: We believe municipalities must play a key role in this effort, especially in the smaller sub-basins, and that any deferral of their full implementation must be carefully weighed.

Response: DEQ agrees with the comment.

W_TW#6: Suggested Change ID #340

Description: Modeling - Section 6 sufficiently describes dispersal pathways

Comment: The pathways for dispersal, described in the TMDL are sensibly described, and are logical in terms of how to approach curbing the presence of methylmercury in the Willamette.

Response: DEQ appreciates the comment in support of DEQ's description of mercury transport pathways.

W_TW#7: Suggested Change ID #341

Description: MOS - Implicit MOS is appropriate

Comment: We view the approach to the Implicit Margin of Safety as appropriate for this process. Having an adequate margin of safety will help guard against uncertainties in this process to help ensure that both human and ecological health are protected and that this TMDL reaches the overarching reduction goal.

Response: DEQ appreciates this comment in support of the appropriateness of the implicit margin of safety.

W_TW#8: Suggested Change ID #342

Description: WQMP - role for municipalities

Comment: We agree that MS4 permit holders have an important role to play in decreasing mercury from urban areas, and we encourage their active involvement and the setting of measurable objectives.

Response: DEQ appreciates the comment in support of active involvement and measurable objectives for MS4 permit holders.

W_TW#9: Suggested Change ID #343

Description: WQMP - measurable goals required

Comment: We believe that all of the WQMPs must have measurable goals.

Response: DEQ agrees that measurable goals and objectives are critical for effective implementation and tracking. The WQMP requires DMAs to develop measurable objectives and milestones specifically related to reducing mercury and sediment movement, however specific measurable objectives will be developed and incorporated into TMDL implementation plans following issuance of the TMDL, typically within 18 months of TMDL issuance.

W_TW#10: Suggested Change ID #344

Description: WQMP - Section 13 Measurable Goals for USFS and BLM

Comment: Given the vast tracts of land owned and managed by the U.S. Forest Service and the Bureau of Land Management, we believe their involvement in the TMDL is critical. They must have clear measurable goals in their WQMPs.

Response: DEQ agrees that defining specific measurable goals and milestones for nonpoint sources of mercury is critical to successful implementation of this TMDL. DMAs, such as USFS, BLM, and ODA, are required to submit measurable goals and milestones for reducing mercury and sediment movement. These objectives will be submitted to DEQ following TMDL issuance and will be incorporated into DMA implementation plans.

W_TW#11: Suggested Change ID #357

Description: WQMP - Agriculture - More robust actions needed than Agricultural Water Quality Management Plans

Comment: Given the breadth of need in regard to reducing runoff from both Agricultural and Forest lands, it seems that a more robust set of actions are needed than relying on the existing Agricultural Water quality Management Plans. While these are helpful, the current system has liabilities that may need not enable the TMDL to meet its target. This is problematic in terms of implementation in our view. If anything this seems like a key opportunity to bolster the existing program at ODA in order to get more out of this effort. Can DEQ provide additional detail in regard to strengthening this element of the program as time moves forward?

Response: DEQ agrees that successful implementation of this TMDL requires large reductions of mercury and sediment movement from agricultural and forest lands. DEQ believes that ODA's recent commitment to expanding the SIA program, by increasing the number of SIAs they initiate every year, will result in increased adoption of best management practices that are protective of water quality.

DEQ also acknowledges that there remains a need for improved riparian conditions on agricultural lands. In order to better characterize effective shade status in riparian areas on agricultural lands, DEQ recently performed an effective shade analysis for part of the Willamette Basin. The results of this analysis will be included in the 2019 Upper Willamette Water Quality Status and Trends reports. While the results of this analysis will primarily be used to help focus implementation in areas where riparian conditions are not meeting effective shade targets of the Willamette Basin Temperature TMDL, they may also be an indication of riparian conditions that are not able to provide for other functions, such as filtering pollutants and stabilizing stream banks, which is important for implementing the Mercury TMDL. ODA is expected to use the results of this analysis to help focus implementation and technical assistance for the purpose of protecting and enhancing riparian conditions. In addition, DEQ will continue to provide Water Quality Status and Trends Reports during the biennial review process for each agricultural water quality management area.

If DEQ determines that agricultural practices subject to the Agricultural Water Quality Management Act are not making satisfactory progress meeting milestones or achieving load allocations, or if the area plan and rules are not adequate to implement the load allocation, the department will provide ODA with comments on what would be sufficient to meet TMDL load allocations during each biennial review process and may request the Environmental Quality Commission to petition ODA to make the necessary changes (OAR 340-042-0080(3)).

W_TW#12: Suggested Change ID #358

Description: WQMP - Agriculture - Monitoring

Comment: What new monitoring will occur out of the TMDL implementation process on lands regulated by the Oregon Department of Agriculture?

Response: DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters associated with specific parcels, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under DMA authority, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

W_TW#13: Suggested Change ID #359

Description: Monitoring - Agriculture - More data needed?

Comment: Does DEQ have robust enough monitoring to determine where there are water quality issues in agricultural areas? Given limitations at the DEQ lab, this seems like a fair question. How is DEQ augmenting it's existing monitoring efforts to meet the need created by the Mercury TMDL?

Response: DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters associated with specific parcels, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

In addition, DEQ will continue to provide Water Quality Status and Trends Reports during the biennial review process for each agricultural water quality management area. DEQ also recently performed an effective shade analysis for part of the Willamette Basin. The results of this analysis will be included in the 2019 Upper Willamette Water Quality Status and Trends Report. While the results of this analysis will primarily be used to help focus implementation in areas where riparian conditions are not meeting effective shade targets of the Willamette Basin Temperature TMDL, they may also be an indication of riparian conditions that are not able to provide for other functions, such as filtering pollutants and stabilizing stream banks, which is important for implementing the Mercury TMDL. ODA is expected to use the results of this analysis to help focus implementation and technical assistance for the purpose of protecting and enhancing riparian conditions.

W_TW#14: Suggested Change ID #360

Description: WQMP - Agriculture - Measurable Objectives

Comment: How will ODA create "measurable objectives" in ODA's WQMPs? While Local Advisory Committees are identified, will these committees represent a broad stakeholder representation that includes those concerned about water quality, human health and the environment? If not, this needs to be part of the WQMP in order to establish meaningful measurable objectives from which improvement can be determined. Specifically, what guidance is DEQ providing to the ODA in regard to setting measurable objectives and the metrics used for tracking measurable objectives?

Response: ODA is responsible for identifying measurable objectives and milestones for implementation strategies and goals. Developing measurable objectives and milestones may be challenging for strategies that address landscape conditions for which there are limited base-line data available. Developing measurable objectives and milestones may also be challenging in circumstances where ODA has yet to develop or adopt a method of analysis.

DEQ will continue to provide technical assistance to ODA in developing measurable objectives and milestones, however it is ODA's TMDL responsibility to identify relevant strategies that ODA can track against a measure of progress. The support that DEQ will provide includes but is not limited to performing predictive analyses using HSPF and varied land management scenarios, providing support to water quality monitoring conducted as part of ODA's SIA process, and providing a Water Quality Status and Trends Report for each of the agricultural water quality management areas during the biennial review process.

W_TW#15: Suggested Change ID #361

Description: WQMP - Forestry - Measurable Objectives

Comment: The language in the Draft TMDL related to the Oregon Forest Practices Act is lacking. A greater level of specificity by the Oregon DEQ would be helpful in directing the implementation and monitoring actions by the Oregon Department of Forestry. While it is nice to think that voluntary actions can be enough to implement this TMDL, given some of the feedback from this and other sectors, it may require the Oregon DEQ to set rules and regulations to augment existing ways of working between agencies. Specifically, what guidance is DEQ providing to ODF in regard to setting measurable objectives and the metrics used for tracking measurable objectives?

Response: DEQ and ODF are currently in the process of updating the MOU between the agencies in order to better identify the roles and responsibilities of each agency as it relates to managing forested lands for the protection of water quality. The completion of the updated MOU should result in clearer guidelines for how the agencies will work together moving forward.

DEQ continues to encourage ODF to consider the recommendations provided in the Sufficiency Analysis, which was co-published by DEQ and ODF in 2002. This analysis identifies specific management strategies that would result in improved protections for riparian areas, implementation of management strategies that reduce fine sediment loading, and other actions that would benefit implementation of this and other TMDLs. For this TMDL, DEQ encourages ODF to consider including measurable objectives related to the recommendations in the 2002 analysis that address mercury and sediment movement. The

2002 analysis, as well as the current MOU can be accessed on DEQ's website: https://www.oregon.gov/deq/wq/programs/Pages/Nonpoint-Implementation.aspx.

ODF is responsible for identifying measurable objectives and milestones for implementation strategies and goals within the first 18 months after TMDL issuance. DEQ will continue to provide technical assistance to ODF in developing measurable objectives and milestones, however it is their TMDL responsibility to identify relevant strategies that they can track against a measure of progress. The support that DEQ will provide includes but is not limited to performing predictive analyses using HSPF and varied land management scenarios, and water quality monitoring and analysis.

W_TW#16: Suggested Change ID #362

Description: WQMP - development of implementation plan and specific metrics

Comment: How will the Oregon DEQ staff be working directly staff from ODA and ODF during the 18 months after issuance to develop specific metrics?

Response: ODA and ODF are responsible for identifying measurable objectives and milestones for implementation strategies and goals within the first 18 months after TMDL issuance. DEQ will continue to provide technical assistance to ODA and ODF in developing measurable objectives and milestones, however it is their TMDL responsibility to identify relevant strategies that they can track against a measure of progress. The support that DEQ will provide includes but is not limited to performing predictive analyses using HSPF and varied land management scenarios, and water quality monitoring and analysis.

W_TW#17: Suggested Change ID #363

Description: WQMP - NPS - DSL

Comment: We believe that the DEQ should work vigorously with the Oregon Department of State Lands to curb erosion from lands held in Trust by the State of Oregon, such as the bed of the Willamette River. This has broad application for a variety of DSL regulated activities.

Response: DEQ agrees that it is important for the agency to continue to work with DSL to address activities that impact water quality. Specifically, this TMDL requires DSL to develop measurable objectives and milestones related to mercury and sediment movement. DEQ believes this represents a positive change in better defining implementation strategies and a renewed commitment to making progress towards reducing impacts to waters of the state.

W_TW#18: Suggested Change ID #364

Description: WQMP - NPS - Oregon State Marine Board

Comment: How will the Oregon DEQ work with the Oregon State Marine Board to limit sediment transport and dispersal from the new class of Wake Surfing Boats? As the DEQ knows, this class of craft

creates large artificial waves that lift sediment, and spread it widely. Wake surfing boats also erode riverside lands, both DSL owned and private. How with the DEQ direct the Oregon State Marine Board to limit wake size and the impact from Wake Surfing Boats on riverside erosion?

Given that the Oregon State Marine Board has very little environmental expertise, it may take additional effort by the Oregon DEQ to direct some of the activities they regulate. Can the Oregon DEQ help set measurable objectives for this agency in regard to large artificial waves that erode riverside land?

Response: DEQ will not direct OSMB to limit wake size, rather OSMB is required as a DMA to explore and identify sources of mercury and sediment movement within their jurisdiction and develop strategies and actions to reduce inputs from these sources. OSMB has authority to adopt boating practice rules, which could include but are not limited to wake surfing boat practices. DEQ encourages OSMB to carefully consider all boating practices that have the potential to increase mercury and sediment movement and to implement actions that will reduce their impact to water quality.

W_TW#19: Suggested Change ID #365

Description: WQMP - Section 13 Measurable Goals for ODA and ODF

Comment: Given the vast amount of land regulated by the Oregon Department of Agriculture, and the Oregon Department of Forestry, we believe that WQMPs from these entities much have clear, measurable objectives.

Response: DEQ agrees that defining specific measurable goals and milestones for nonpoint sources of mercury is critical to successful implementation of this TMDL. DMAs, such as ODF and ODA, are required to submit measurable goals and milestones for reducing mercury and sediment movement. These objectives will be submitted to DEQ following TMDL issuance and will be incorporated into DMA implementation plans.

W_TW#20: Suggested Change ID #366

Description: WQMP - Monitoring must be robust, timely and accurate

Comment: We believe that the monitoring related to all WQMPs must be robust, timely, and accurate. This is imperative to the ultimate success of the implementation of the Mercury TMDL for the Willamette River Basin.

Response: DEQ agrees that a robust water quality monitoring framework is critical to using adaptive management to reach water quality goals and for successful implementation of the TMDL. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters associated with specific parcels, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time, and if human sources could be a contributing factor, DEQ will require revision of

designated management agency and responsible person implementation plans to better address mercury loading from these sources.

W_TW#21: Suggested Change ID #367

Description: WQMP - comprehensive monitoring strategy must be funded adequately

Comment: We encourage the U.S. EPA and the Oregon DEQ in the development of a very comprehensive Monitoring Strategy for the implementation of this TMDL. We also encourage the DEQ to work hard to obtain the appropriate level of resourcing for this effort. This has long been a limitation for the agency, and at this point there is really no option other than making sure the appropriate level of funding is available for staffing and any equipment needs at the DEQ Lab.

Response: Thank you for your comment. DEQ is working with EPA to develop a draft Assessment and Monitoring Strategy as identified in the TMDL and to support adaptive management for TMDL implementation. This document will be made available to the public for review. DEQ will work with DMAs, funding entities, and prioritization of existing DEQ resources for implementation of the Assessment and Monitoring Strategy.

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78. Comments from: Beyer, Roger of Oregon Seed Council

B_RO#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

B_RO#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry, agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

B_RO#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model.

This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

B_RO#4: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_RO#5: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the

national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_RO#6: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_RO#7: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor

required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression; however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

B_RO#8: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

B_RO#9: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to gaged flows, the modelers reported that "Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows"; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading. DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

B_RO#10: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is "estimated to be 361 g/day", a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value "351.42 g/day" for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

B_RO#11: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

B_RO#12: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

B_RO#13: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

B_RO#14: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each separately. -Providing examples in which "sites", which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

B_RO#15: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including "sites" as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A “random effect” is a statistical term for describing a site specific effect on the value of a variable. The term “fixed” effect refers to how the value of a variable changes according changes in the value of another variable. In the case of the TSS surrogate analysis, the “random effect” is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

B_RO#16: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

B_RO#17: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate “to estimate allocations for pollutants addressed in the TMDL”. However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be “used for evaluating effectiveness of the TMDL” because monitoring of “total mercury can be difficult and cost-prohibitive”. This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have

occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

B_RO#18: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

B_RO#19: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to

strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

B_RO#20: Suggested Change ID #303

Description: WQMP - Implementation Plans - global sources

Comment: In Timeline for Attainment section, ODF appreciates the recognition of global mercury emissions and air deposition as the primary mercury source in Oregon. Messaging to other entities (local, regional, national, global) about this issue is important.

Response: DEQ agrees with the comment.

B_RO#21: Suggested Change ID #312

Description: Modeling - LA modeling is based on uncertainty

Comment: Load allocation modeling is based on uncertainty. Mercury wasteload allocations are based on six separate and contested computer models, each with accompanying uncertainties. Additionally, the 'mass balance model' has compounded uncertainties because it utilizes two models' outputs as the inputs. This layering of uncertain modeling injects significant uncertainty into the load allocations.

Response: Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

B_RO#22: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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79. Comments from: Rose, Richard Herrington

R_RH#1: Suggested Change ID #7

Description: WLA - 700PM - suction mining removes mercury and no studies show a rise of mercury in fish after dredging

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge mining can remove mercury from streams and there is no data showing a rise in mercury in fish after dredging has occurred.

Response: DEQ agrees that suction dredge miners sometimes find and remove elemental mercury during dredging in streams. A study referenced in the TMDL as (Humphreys 2005) found that suction dredging in a mercury hotspot lost approximately 2% of mercury from the dredge, which was more than ten times higher than hazardous waste classification levels and was associated with very fine clay sediment, which stays in suspension and is carried to areas where methylation is known to occur. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.14 mg/kg to 1.34 mg/kg (Hygelund et al, 2001) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

R_RH#2: Suggested Change ID #20

Description: WLA - 700PM - Sharps Creek and other tributaries to Dorena Reservoir should not be 303(d) listed

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because Sharps Creek is a secondary transport pathway for mercury and should not be 303(d) listed.

Response: DEQ is not currently proposing to add Sharps Creek or other tributaries to Dorena Reservoir to the 303(d) list of waterbodies impaired by mercury. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Sediment analyzed from Sharps Creek was found to have a mean concentration of 0.20 mg/kg mercury (Hygelund et al 2001). Because Sharps Creek is tributary to Dorena Reservoir and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments.

R_RH#3: Suggested Change ID #21

Description: WLA - 700PM - suction mining is not the source of mercury and mercury contribution from suction mining is low

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because DEQ's studies show mining is only 1% of the mercury load for the Willamette Basin, so mining is not a mercury issue. This TMDL proposal unfairly burdens suction dredge miners as point-source polluters when they are not the source of the mercury. Abandoned mines on federal land are responsible.

Response: DEQ clarifies that the TMDL modeling indicates that all permitted wastewater point source discharges contribute approximately one percent of the mercury load within the Willamette Basin. Suction dredge mining discharges regulated by the 700-PM permit contribute an unquantified amount of

this one percent. The TMDL modeling also estimated that the tributaries to Dorena Reservoir contribute about 0.12 kg/yr of mercury, which is about 7% of the contribution from all permitted discharges in the entire basin. The studies referenced in the TMDL indicate that disturbance by suction dredging increases the potential for mercury that is currently present in the sediment of streams to be uncovered, oxygenated, transformed to dissolved and suspended states, transported downstream to Dorena Reservoir and methylated. Because mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury, and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, DEQ's TMDL prohibits suction dredge mining in tributaries to the reservoir to reduce permitted discharges of mercury and reduce methylation potential of existing mercury contamination in stream sediments. Finally, DEQ's TMDL also requires reduction of mercury by 95% from legacy mine-related sources, with the federal agencies as designated management agencies responsible for implementation.

R_RH#4: Suggested Change ID #103

Description: WLA - 700PM - complete reservoir management measures prior to prohibiting suction dredge mining in tributaries to Dorena Reservoir

Comment: Suction dredge miners may be able to improve methods of capturing mercury and mitigating mercury mobilization

Response: The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. Mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

R_RH#5: Suggested Change ID #192

Description: WQMP - fails to address known, actual legacy mining and active sources

Comment: DEQ needs to provide a program to reduce mercury contamination at its source. It is a known fact that there were and are mercury and gold mines in the Cascades. Mercury is and has been used to purify and process gold ore. If these sites are not controlled then residues of mercury from these sites will continue to be transported into tributaries and basins that flow into the Willamette River. After these mining activities were stopped, a number of Dams were constructed that have since accumulated sediments that would contain mercury. An example of this could be the Santiam River which would explain the mercury levels in this river. The sediments collected behind the dams need to be evaluated for removal as a means to reduce and control mercury in the Willamette River. The mercury and gold mining sites, current and past also need to be evaluated for control of residues of mercury at these sites. Presently

there is not any known effort of this occurring. The Department of Oregon Geology and Minerals Industries (DOGAMI) needs to be involved in this effort of identifying the sources of mercury and actual as well as potential for mercury contamination in the Willamette Basin. DOGAMI oversees the NPDES wastewater discharge program for mines in Oregon. However, the DEQ has not involved DOGAMI in development of this TMDL program. This needs to change — the sooner the better. There may be other examples and locations of actual positive and measurable means to remove and reduce mercury in the Willamette Watershed. We can only hope that the DEQ will address these. Increased and expensive mercury reduction programs for cities and counties that do not have any mercury to control is a waste of resources in light of the actual known sources of mercury and ODEQ's failure to recognize and address the actual sources of mercury and develop an program to reduce these known and documented sources.

In development of the proposed rules to reduce mercury levels in the Willamette River, the Oregon Department of Environmental Quality has failed to make any requirement to reduce the actual measureable and known sources of mercury. This includes the contamination left behind by historic gold mines that used mercury to refine and process gold, the contamination resulting from actual mercury mines, mercury associated with known geological sources of mercury, and mercury associated with industrial sources and even sources associated with recycling of Mercury waste products. Some of these sources are identified and mentioned by ODEQ in their reports but there is not any mention of how to better manage and control and/or remove these sources. The question is this — Why is the DEQ not proposing to manage and control these sources? This question needs to be answered by the DEQ.

Response: DEQ disagrees with the comment that presently there is no known effort to evaluate and control past mercury and gold mining sites in the Willamette Basin. As noted in Sections 9.2.3 and 13.3.1.2 of the Willamette Basin Mercury TMDL, DEQ continues to collaborate with EPA, BLM and USFS on investigation, assessment and remediation of the abandoned mine lands identified on Table 9-2 within the Willamette Basin. DEQ also disagrees that DEQ has not involved DOGAMI in mercury contamination from mining and development of the TMDL, because DOGAMI participated on the Willamette Basin mercury TMDL Advisory Committee and is a Designated Management Agency named in the TMDL, which must develop and implement a TMDL Implementation Plan. Finally, DEQ appreciates the acknowledgement of mercury being captured in sediment behind dams in the basin. As noted in Sections 9.2.2 and 13.3.1.22, the TMDL requires evaluation of the largest reservoirs in the basin for presence of mercury and methylation potential. The US Army Corps of Engineers, US Bureau of Reclamation, Eugene Water and Electric Board and Portland General Electric are required to develop and implement TMDL Implementation Plans. These plans must include implementation of control measures, which may include sediment removal or isolation.

R_RH#6: Suggested Change ID #374

Description: WLA - 700PM - miners do not introduce mercury to streams in harmful amounts and are willing to remove mercury

Comment: Do not prohibit suction dredge mining in tributaries to Dorena Reservoir because suction dredge miners do not introduce mercury above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife or other designated beneficial uses. To the contrary, miners are willing and able to mitigate mercury encountered during their operations and wish to become part of the solution, not the target as a polluter.

Response: The studies referenced in the TMDL show that the process of suction dredging increases the mobility of mercury within streams, which increases its transport to downstream waterbodies such as Dorena Reservoir. Mercury has been measured in the sediment of tributaries to Dorena Reservoir ranging from 0.08 mg/kg to 8.78 mg/kg (Hygelund et al, 2001 & Tobias and Wasley, 2013) and Dorena Reservoir is a known area of mercury methylation, is listed for mercury on the 303(d) list of impaired waterways and has fish consumption advisories in place for mercury. Because mercury contamination exists in stream sediment in tributaries to Dorena Reservoir and there are no demonstrated methods to prevent the mobilization during suction dredge mining and subsequent methylation of mercury, stopping suction dredge mining is needed to reduce mercury in the water and fish in the Dorena Reservoir and its tributaries.

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80. Comments from: Boshart, Stan of SJB Farms

B_S#1: Suggested Change ID #213

Description: General - Agriculture, forestry, and other sectors are already protective of water quality

Comment: The agricultural and forestry sectors have always been proactive about protecting, maintaining and enhancing water quality on agricultural and forestry lands, which combined represent by far the largest land use in the Willamette Valley. Indeed, our industries were proactive in developing the Agricultural Water Quality Management Program and Forest Practices Act years before most states had thought of developing their nonpoint source programs. Since that time, we have invested millions in studies, on-the-ground work, and compliance with our respective programs. We will continue to be proactive into the future, as evidenced by the millions invested by each of our sectors each year in proactive water quality improvements. We support these regulations and believe in their effectiveness in protecting water quality.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants. DEQ will use Total Suspended Solids as an instream surrogate target level to help reduce high TSS levels and identify events when larger loads of mercury could be entering the streams and rivers in of the Willamette Basin. DEQ will use total mercury concentrations to assess progress toward meeting the load allocations.

B_S#2: Suggested Change ID #214

Description: Source Assessment NPS - Atmospheric deposition is dominant source of mercury

Comment: Atmospheric deposition from other states and countries needs to be addressed in order to achieve full restoration of the beneficial use. Without addressing the real cause of mercury exceedances, this TMDL may request reductions that are larger than any basin stakeholder can manage. Forestry,

agricultural, and other activities are already regulated to protect water quality and are not the cause of any mercury problem in the Willamette Basin. The TMDL could suggest unwarranted restrictions be placed on forestry and agricultural activities that will have no impact on the amount of mercury.

Oregon's farmers and foresters are doing an exceptional job investing in water quality improvements, studying water quality on our lands, and meeting the requirements of our programs, and we will continue to do so after this TMDL is adopted

Response: Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from global sources, there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality. DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

B_S#3: Suggested Change ID #215

Description: Modeling - Lacks sensitivity analysis

Comment: Appendix A of the TMDL document, the Technical Support Document, describes no sensitivity analyses of the model output to reasonable variations in model input data sets or parameters. For example, no sensitivity analyses have been performed to determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM. This implies that other reasonable values for this and other important modeling input parameters might also lead to satisfactory model calibrations. However, these different values would also lead to different outcomes for the target mercury concentration that drives the load and wasteload allocations.

Response: The modeling process to get values of the biomagnification factor for the different fish species explicitly incorporated the variation model parameters by using the probabilistic approach in the Monte Carlo simulation. Figures 3-4 and 3-5 in the technical support document show the variation of some key model parameters. Furthermore, the model parameters and how they were simulated in the Monte Carlo Simulations are listed in Table 3-2 in the Technical Support document. Also, the response of the model to these variations are discussed in section 3.6 of the Technical Support Document. Some key insights about how some model parameters are provided in this discussion, such as specification of the distribution of exposure concentrations is a primary factor controlling the tails of the cumulative distribution functions used in the simulations or future to refine predator-prey interaction probabilities in the Food Web Model. This is the information that DEQ used to "determine how the values of the biomagnification factor of the Food Web Model (FWM) might vary given other modeling decisions or how its variation might affect the calibration of the FWM"

B_S#4: Suggested Change ID #217

Description: Modeling - Food web - uncertainty to the target THg

Comment: The FWM links methylmercury exposure of fish to fish tissue concentrations based on an understanding of the Willamette River food web and the bioaccumulation and biomagnification within it. This model is calibrated so the concentrations of mercury in fish tissue match the concentrations measured in fish tissue samples collected from the Willamette River and its tributaries. However, once calibrated, its main utility is to provide one of its parameters, the biomagnification factor, to the mercury translator model (discussed below). This approach introduces significant and compounded uncertainty to the target THg concentration in the Willamette River.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_S#5: Suggested Change ID #218

Description: Modeling - Food web - uncertainty of THg - Comment 60

Comment: The FWM calibration is marginal for the northern pikeminnow. This is the only fish whose parameterization is used in the determination of the target concentration of THg in the river system. Although no statistical evaluation of the quality of the calibration was provided in the contractor's modeling report, inspection of Figure 3-4 in the Technical Support Document (i.e., TMDL Appendix A) reveals that the cumulative distribution function of modeled fish tissue mercury concentrations in the northern pikeminnow agrees with the distribution of observed data only around the 60th percentile concentration. Most of the rest of the modeled distribution is outside the 95% confidence interval of the distribution based on observed data. With this marginal and unquantified model calibration (and the lack of sensitivity analyses described above), we cannot be confident in the target THg concentration.

Response: DEQ considers the median biomagnification factors from the Food Web Model to be sufficiently accurate based comparison to national values. The information presented in Figure 3-4 for the Northern Pikeminnow is for the cumulative distribution function used in the Monte Carlo simulations to get a sample of 10,000 biomagnification factors. These biomagnification factors are what is used in the mercury translator equation to get the target total mercury. The commenter is correct in their observation that the tails of the cumulative distribution function not matching the tails of the cumulative distribution. This is why DEQ selected the median values of the target total mercury to use in the TMDL. DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the ranges of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_S#6: Suggested Change ID #219

Description: Modeling - Food web - uncertainty target THg #2- Comment 60

Comment: We understand that the model input parameters pertaining to three main processes were used to calibrate the FWM: the fish ingestion rate of mercury, the fish assimilation rate of mercury, and the fish

elimination rate of mercury. From this approach, the necessary biomagnification factor is determined for the model to match observed fish tissue concentrations as closely as possible. We are concerned that there may be other reasonable values for these model input parameters that produce a decent match between the model output and observed fish tissue concentrations. If so, these would require different biomagnification factors for model output to match data. We acknowledge that this probabilistic model does not use single values for its model input parameters but instead expresses them as distributions. However, the median value of the distribution of biomagnification factor, not a range resulting from the distribution, is used in the calculation of the target THg concentration in the river. Therefore, there may be other reasonable distributions for the biomagnification factor (and, consequently, other median values) that can lead to an acceptable model calibration. This implies that the model could produce the "right" answer for the wrong reason. Consequently, we lack confidence in the target THg concentration that is calculated, in part, from the median biomagnification factor determined by the EPA contractor.

Response: DEQ compared the median biomagnification factors from the Food Web Model to national values from EPA in Figure 6-2. The median of the biomagnification factor Northern Pikeminnow fell within the range of the national values given by EPA and DEQ consider this conformation that the Food Web Model results were adequate to use in the Translator Equation.

B_S#7: Suggested Change ID #220

Description: Modeling - Mercury Translator Model

Comment: The Mercury Translator Model uses the biomagnification factor from the FWM and a mercury translator value to calculate a target concentration of THg in the water column from the concentration of dissolved methylmercury used as an input variable to the FWM. In this model, the slope of the regression line calculated from the aggregation of individual pairs of measured THg and methylmercury concentrations in the water column is heavily influenced by three pairs of observations. The remaining pairs of observations in Figure 6 3 do not fall in a line. We question whether linear regression is an appropriate statistical method for calculating the translator value. It may be more appropriate to present the translator value for each HUC8 basin and then average the 12 values while expressing the uncertainty of that mean. The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration.

Response: Regarding the statement, "The use of linear regression on a data set that is neither linear nor normally distributed leads us to question the validity of the target THg concentration", please refer to Section 4.2 in the Technical Support Document for a more thorough discussion of the mercury translator approach. Median dissolved MeHg and median total THg do exhibit an approximately linear relationship and there is no strong evidence of heteroscedasticity. Perfect linear correlation is neither expected nor required for linear regression. Regarding normality, it is common for environmental data to deviate from an assumption that regression residuals are normally distributed. However, a linear regression remains the best linear, unbiased estimator (BLUE) of the coefficients regardless of whether the residuals are normally distributed; the normal distribution assumption is relevant primarily to the interpretation of statistical tests on the regression parameters. The actual requirements for linear regression to be BLUE under the Gauss-Markov theorem are less restrictive: The residuals should be uncorrelated, have approximately equal variances, and have an expectation of zero. Further, the linear model assumptions are generally robust to small deviations from these assumptions. See for example Peter Kennedy's A Guide to Econometrics (1979) for discussion of these issues. Because we are working with medians of data from different geographic areas we do not expect correlation among the residuals. If the expected value of the residuals was non-zero, the primary result would be a bias in the intercept term of the linear regression;

however, we are imposing a zero intercept model here. Visual examination does not suggest any strong difference in residual variances between sites, although a rigorous test is not possible due to the presence of many non-detects. Note that simply averaging the ratios across HUCs would give approximately the same answer for most points (dMeHg:THg approximately equal to 0.016), but without a correction for sample size or meeting BLUE criteria because the relationship is essentially linear. It is therefore DEQ's opinion that the translator analysis is appropriate for use in the TMDL and no changes have been made to the document or analysis.

B_S#8: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL

development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

B_S#9: Suggested Change ID #222

Description: Modeling - HSPF Model

Comment: The HSPF model raises some additional concerns: -Our experience suggests the model's representation of agricultural land may be poor. We are unsure of the impact of any inaccuracies on the final modeling results. We have not seen an explanation of the justification of infiltration rates in this model. This is critical for the distinction used by your team between mercury attributable to atmospheric sources and to groundwater. -The soil mercury concentrations interpolated from a 2013 USGS study appear to be highly uncertain due to a low spatial resolution of the observed data and a lack of detail in the interpolation (Tetra Tech, 2018a).

Response: DEQ and EPA used an existing HSPF model of the Willamette River Basin. DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria.

The existing model was updated to the most recent available land use, but was not recalibrated. The existing model used STATSGO soil survey information on hydrologic soil group (HSG) to assign initial values of the index to soil infiltration rate (INFILT) for each of the four HSG classes (A: > 0.75 cm/hr; B: 0.40-0.75 cm/hr; C: 0.15-0.40 cm/hr; and D: 0-0.15 cm/hr). Initial values for INFILT were set at the middle of the ranges for HSGs B, C, and D, consistent with EPA's BASINS Technical Note 6, "Estimating Hydrology and Hydraulic Parameters for HSPF." During calibration of the existing model to gaged flows, the modelers reported that "Infiltration was generally increased from the initial values to increase storm peaks and reduce low flows"; however, the values remained within the recommended ranges for each HSG class.

Partitioning of precipitation input into evapotranspiration, surface runoff, and groundwater is used to predict total mercury loads associated with surface runoff, erosion, and groundwater baseflow loading.

DEQ concluded that the existing results for hydrology and associated flow pathways are reasonable and provide a sufficient basis for the development of TMDL allocations. As with all environmental simulation models, there are uncertainties in the predicted results that could potentially be reduced by additional efforts at model calibration and adjustment of the model to a finer spatial scale. DEQ plans to identify key sources of uncertainty in the mass balance modeling as part of the monitoring program being developed for the WQMP and may refine the HSPF model in future if needed.

DEQ also acknowledges that the soil mercury concentrations derived from the 2013 USGS study are uncertain due to a low spatial resolution of the observed data (there were only 3 samples from agricultural land so simple averaging was used, there not being sufficient samples for spatial interpolation). This is the best information currently available. The resulting soil concentrations for agriculture and forest are consistent with the general trends among land uses summarized in D. Obrist et al., 2016, Science of the Total Environment 568:522-535. Further refinement of surface soil mercury concentrations in agricultural land areas would require additional sampling. If such data are obtained, the results and could potentially be stratified based on tillage, harvest, and residue management practices, as well as adjusted to reflect spatial patterns across the basin, and could be used to further refine estimates of total mercury loads.

B_S#10: Suggested Change ID #224

Description: LA - Load capacity and allocation of THg

Comment: The calculation of the daily loading capacity of THg in the Willamette River system is presented in Section 7.2. The load determined is 42.17 g/day. This value is critical for developing the load and wasteload allocations in Section 10. However, this calculation is unclear. Below Table 7-1, the text states that the quantity LCurrent is “estimated to be 361 g/day”, a value consistent with Table 6-7. However, in the ensuing equations that calculate the quantities LExcess and Load Capacity, the value 351.42 g/day is used for LCurrent. Using the value of 361 g/day leads to a slightly higher load capacity. If this is an error, please correct it. If 351.42 g/day is the correct value for LCurrent, please alter this passage to resolve the confusion we express here.

Response: The value “351.42 g/day” for the current load was an error. DEQ recalculated the TMDL equation and components using the correct current load of 361 g/day and made the changes in the TMDL report.

B_S#11: Suggested Change ID #225

Description: Modeling - TSS as a surrogate for mercury

Comment: ODEQ evaluated the use of the concentration of TSS as a surrogate for the concentration of THg in water. If the relationship between the concentrations of TSS and THg is statistically robust, then TSS could be measured in place of THg, thus reducing the costs of assessment and monitoring related to this TMDL. As presently drafted, the analysis presented in Section 10.3 and Appendix H raises several concerns about whether the concentration of TSS can defensibly be adopted as a surrogate for the concentration THg in this system. In a memo from the EPA contractor that was provided to the Willamette Basin TMDL Advisory Committee in an e-mail from Priscilla Woolverton on 14 June 2019, TSS is ranked as the least preferable of four surrogates analyzed, behind suspended sediment concentration and two separate turbidity measurements (Tetra Tech 2018b). This analysis was not

mentioned in the TMDL document or Appendix H. Please explain why TSS has been chosen by ODEQ as a surrogate rather than other options that have been judged as preferable. The use of TSS as a surrogate is justified with a citation in Section 1.1 of Appendix H to a paper about urban stormwater runoff. Please justify this use of TSS as a surrogate by providing and explaining in detail the findings of any papers that show a relationship between TSS and THg in a river system that resembles to the Willamette River and its tributaries. The statistical relationship described in Appendix H (known as a Linear Mixed Effects, or "LME" statistical model), shows that measurements of TSS and the specification of the location of that measurement can explain 81% of the variation in the THg data set. Thus, estimating THg concentrations with a surrogate introduces uncertainty into measurements of THg. This is especially true because of the low concentrations of THg, which imply that even small absolute uncertainty can have a large relative importance. Please describe how this uncertainty will be addressed if TSS is to be used as a surrogate during allocation, compliance, or field monitoring.

Response: TSS is often used as a surrogate for pollutants, such as heavy metals and organic pollutants (Eckley & Branfireun, 2009 referenced in the TMDL). For example, TSS was used as a surrogate for DDT (Dichlorodiphenyltrichloroethane) to meet instream targets for the Lower Yakima TMDL in Washington (Johnson, 2005 referenced in the TMDL). DEQ revised Section 10.3 and Appendix H with clarifications on the use of TSS as a surrogate instream target. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in this section. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

B_S#12: Suggested Change ID #227

Description: Modeling – LME model – show that data are sufficient and adequate

Comment: Please demonstrate that the data used for the LME model are: -Sufficient: Why does ODEQ believe that 63 paired observations are enough for this analysis? How many samples are generally used to develop strong LME models? -Adequate: Please show the results of statistical tests that evaluate the normality of the TSS and THg data sets following the logarithmic transformation that was performed.

Response: Please see Section 10.3 Appendix H in the TMDL. DEQ revised Section 10.3 and Appendix H in response to this and other comments.

B_S#13: Suggested Change ID #228

Description: Modeling – LME model – justify use of model

Comment: The LME model is complicated. Please justify the use of the LME model by explaining: -why a simpler model (such as a multivariate model using TSS and sampling location) cannot be used here, -why it is valid to assume that observations from the same sampling site are not independent (this is implied by the choice of "sites" as a random effect in the LME model), and -how the "sites" variable was represented in the LME model. Is it categorical or continuous?

Response: DEQ revised Section 10.3 and Appendix H in response to this and other comments. The LME is the appropriate model to account for random (site specific) effects before examining how TSS relates to total mercury. This approach is able to appropriately account for sources of variance in the analysis.

B_S#14: Suggested Change ID #229

Description: TSS Surrogate model – clarify results

Comment: The results of this analysis are unclear. Please clarify by: -Stating the intercepts for the fixed and random effects separately in Equation 3 of Appendix H. This will make the random effects due to the variable "sites" clearer. -Showing both the adjusted R2 and conditional R2 in Table 9 and discussing each separately. -Providing examples in which "sites", which you have identified as a random predictor variable, are used along with TSS to predict concentrations of THg.

Response: DEQ revised Appendix H in response to this and other comments. DEQ included the full model summaries for the LME models, show separate R2 values and included the sites in Table 1.

B_S#15: Suggested Change ID #231

Description: TSS surrogate model – Clarify how LME model can guide management decisions

Comment: Finally, if the above concerns can be resolved, we request that ODEQ clarify how a complicated LME model can guide mercury management by ODEQ or Designated Management Agencies. Does including "sites" as a random effect imply that each surrogate relationship will need to be site-specific? How can a surrogate relationship be used in practice to monitor THg concentrations (via measuring TSS concentration) when the relationship includes random effects?

Response: DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used as one tool for evaluating TMDL implementation effectiveness. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows. In addition, the use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

A "random effect" is a statistical term for describing a site specific effect on the value of a variable. The term "fixed" effect refers to how the value of a variable changes according changes in the value of another variable. In the case of the TSS surrogate analysis, the "random effect" is the sampling site for total mercury and TSS, which controls the staring values for total mercury and TSS. The fixed effect is TSS, which means the change in total mercury in response to a change in TSS is expected to be the same regardless of site. In other words, the site sets the starting value for total mercury, but the response of total mercury to change in TSS is the same regardless of site.

B_S#16: Suggested Change ID #232

Description: Modeling – TSS surrogate is confusing and arbitrary

Comment: The present surrogate analysis leads us to three main concerns: 1. This surrogate analysis creates opacity for our members because it does not incorporate available background information, adds uncertainty, and adds complexity without justification. It could easily lead to in-stream TSS requirements that seem arbitrary to our members. 2. The apparent flaws in the statistical model cause concern that its use by ODEQ or our Designated Management Agencies will require our members to do much more than necessary to control erosion and sediment runoff. One of the examples in Appendix H implies that the water must have unmeasurably low concentrations of suspended sediment to meet the target concentration of THg. 3. This surrogate analysis will be confusing to our members because we do not understand how a statistical model with random effects will be used in practice.

Response: Based on the analysis presented in Section 10 of the TMDL and Appendix H, DEQ considers there to be a strong relationship between THg and TSS. Therefore, based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. DEQ revised Section 10.3 and Appendix H with clarifications on the intention that TSS surrogate targets will be used. The use of TSS surrogate targets and other tools will be described in the Assessment and Monitoring Strategy that is being jointly developed by DEQ and EPA, an overview of which is provided in Sections 13.6 and 14.1.6.

B_S#17: Suggested Change ID #233

Description: Modeling – TSS Surrogate – Monitoring THg

Comment: Further, Section 10.3 of the TMDL document justifies the use of a surrogate by citing Oregon Administrative Rule (OAR) 340-042-0040(5)(b), which permits the use of a surrogate "to estimate allocations for pollutants addressed in the TMDL". However, Section 10.3 of the TMDL document presents a statistical relationship between TSS and THg and uses it to determine allocations of TSS that would correspond to the allocations of THg already developed. The TMDL document then states that these TSS allocations will be "used for evaluating effectiveness of the TMDL" because monitoring of "total mercury can be difficult and cost-prohibitive". This indicates that ODEQ seeks to use TSS as a surrogate to facilitate monitoring following the allocations of mercury in Section 10.1, not to create the allocations themselves. This contradicts the allowed use of a surrogate in OAR 340-042-0040(5)(b). Section 10.3 of the TMDL document and Section 1.1 of Appendix H state in general terms that monitoring for THg can be difficult and cost-prohibitive. However, monitoring of THg must have occurred to include Willamette River reaches and tributary reaches on the 303(d) list in the first place. If a surrogate will be used, what will be the appropriate mix of surrogate measurements and THg measurements? Will any THg measurements be made if a surrogate is used? What would be the cost savings gained from using TSS as a surrogate for THg, and why is this enough to justify the development of this statistical relationship and the uncertainties that will come with the use of a surrogate?

Response: "Surrogate Measures" are defined in OAR 340-42-0030(14) as "substitute methods or parameters used in a TMDL to represent pollutants." In addition, OAR340-042-0040(5)(b) states that "DEQ may use surrogate measures to estimate allocations for pollutants addressed in the TMDL." This statement does not preclude use of surrogate measures in other TMDL components. In using surrogate

measures, DEQ followed OAR OAR340-042-0040(5)(b) in that the TMDL establishes the relationship between the surrogate measure (TSS) and pollutant (mercury; mercury is difficult to measure and TSS is closely related to mercury and is easier to monitor and track.

DEQ revised Section 10.3 and Appendix H with clarifications on the TSS surrogate targets. Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in Section 10. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

The TSS surrogate targets will apply to the mainstem Willamette and HUC8 outlets. The TSS surrogate targets will be used for reducing total mercury instream and as one tool for evaluating progress towards achieving allocations and total mercury TMDL water column target described in Section 10. In addition, because TSS is a cost effective surrogate it will be used to supplement but not supplant the allocations and TMDL water column target for evaluating TMDL implementation effectiveness. The Assessment and Monitoring Strategy that DEQ is developing will include information on monitoring for THg in addition to other parameters which will be discussed with DMAs during implementation planning.

B_S#18: Suggested Change ID #234

Description: Appendix H – Structure is misleading

Comment: Finally, the structure of Appendix H, Table 12 makes this surrogate analysis start to look like a TSS reduction program rather than a THg reduction program. It would be more appropriate to write about the THg reductions ODEQ seeks and correlate that to TSS rather than discuss the TSS reductions ODEQ needs to see.

Response: DEQ agrees and has added content to TMDL report clarifying how the TSS surrogate will be used.

B_S#19: Suggested Change ID #235

Description: General – TMDL will not be effective, hard to implement

Comment: Our organizations and the foresters, farmers, and growers of Oregon have done much in recent decades to protect surface water quality. From new stream buffers to wet weather haul rules to strategic implementation areas, we have worked with DEQ and our DMAs to protect the waters of our state. We commit to continuing this close engagement on water quality issues into the future. However, we have significant concerns about ODEQ's development of this TMDL and the compounded uncertainties discussed above. Given that this pollution is largely outside of Oregon's control, the concern with the TMDL outlined above will make it hard to create buy in on this TMDL from our members. Why should Oregon's farmers and foresters be required to mitigate pollution they did not introduce? Likewise, the TMDL proposes to regulate Total Suspended Solids as a means of driving reductions in fish tissue methylmercury concentrations. The relationship between these two parameters is extremely remote, and requires the agency model several water quality parameter relationships with compounding uncertainty. This creates the very real risk that Oregon will require very expensive measures with no change relative

to the actual water quality standard. This problem is due in part to the highly conservative water quality standard upon which this TMDL is based. When compounded by additional, unquantified, and conservative assumptions in the TMDL modeling, the margin of safety implicit in the load reductions specified by this TMDL are exceedingly cautious and divorced from reality. Oregon farmers and foresters should not be asked to bear the risk of this uncertainty. We encourage ODEQ to address our concerns, and to work closely with the Designated Management Agencies (DMAs) on implementation to assess what is truly possible and necessary within localized areas.

Response: DEQ acknowledges that there are stakeholders from multiple sectors, representing varied land uses and sources of mercury, that have already been implementing strategies and actions that are protective of water quality. DEQ anticipates that continued, as well as increased efforts to protect water quality will help the basin reach water quality goals for mercury and other TMDL pollutants.

Based on the relationship found between total suspended solids and total mercury, surrogate instream targets were set for reductions in high levels of TSS concentrations to reduce total mercury in stream and evaluate progress towards achieving the allocations and total mercury TMDL water column target described in the TMDL. These reductions of TSS are expected to reduce total mercury loads that could occur during high precipitation events and high flows.

B_S#20: Suggested Change ID #303

Description: WQMP - Implementation Plans - global sources

Comment: In Timeline for Attainment section, ODF appreciates the recognition of global mercury emissions and air deposition as the primary mercury source in Oregon. Messaging to other entities (local, regional, national, global) about this issue is important.

Response: DEQ agrees with the comment.

B_S#21: Suggested Change ID #312

Description: Modeling - LA modeling is based on uncertainty

Comment: Load allocation modeling is based on uncertainty. Mercury wasteload allocations are based on six separate and contested computer models, each with accompanying uncertainties. Additionally, the ‘mass balance model’ has compounded uncertainties because it utilizes two models’ outputs as the inputs. This layering of uncertain modeling injects significant uncertainty into the load allocations.

Response: Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety.

B_S#22: Suggested Change ID #313

Description: Allocations - Table - 10.1 - atmospheric deposition is unclear and double counted

Comment: The role of atmospheric deposition is unclear. The TMDL allocations depend on the categorization of different sources (Table 10-1). In this categorization, atmospheric deposition is double counted as part of both the "General Non point Source and Background" and as its own separate category. Additionally, the TMDL lacks clarity on atmospheric deposition of mercury and the impact that foreign sources of mercury are having on our waterways. Section 14.2 of the TMDL document states clearly that atmospheric deposition of mercury is the dominant source of mercury reaching Willamette Basin streams and that air emissions from Oregon are small relative to global sources.

Atmospheric deposition is entered twice in table 10-1 - under "General Nonpoint Source and Background" and under Atmospheric Deposition. What is the difference? Is it double counted?

Response: DEQ acknowledges that accounting for atmospheric deposition in the TMDL is complex and the simplification of all sources into Table 10-1 can be confusing. The second paragraph of Section 10 acknowledges that the analysis of the available information did not allow for quantification and distinctions between the various components of atmospheric deposition. The closing sentence of the paragraph clarifies that the broad category of "atmospheric deposition," as it appears in Table 10-1, captures the source categories modeled and described in the TMDL Technical Support Document as "sediment erosion," "surface runoff" and "atmospheric deposition direct to streams." For clarity, particularly with regard to implementation, DEQ used different terminology in the TMDL and WQMP than was used in the TMDL Technical Support Document. DEQ acknowledges that the categories in Table 10-1 are confusing, even with the footnotes which were intended to add clarity. DEQ revised the presentation of category labels in Table 10-1 and added an additional footnote to explain that modeled estimates from the TMDL Technical Support Document for the categories of General Nonpoint Source, Non-Permitted Urban Stormwater and Atmospheric Deposition are combined, though allocations for the three source categories are assigned separately. While atmospheric deposition affects all source categories, it is not double counted in the allocations, as summarized in the revised Table 10-1.

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81. Comments from: Hubbard, Tom of City of Corvallis Public Works

H_T#1: Suggested Change ID #130

Description: Monitoring and evaluation - request for future stakeholder involvement

Comment: Monitoring and Evaluation (Section 13.6, p124)

TMDL Text: "DEQ and EPA are currently developing an Assessment and Monitoring Strategy to Support Implementation of Mercury Total Maximum Daily Loads for the Willamette Basin."

Comments: We request that this Assessment and Monitoring Strategy include stakeholder involvement or, at a minimum, be made available for public comment and/or DMA input prior to implementation. This would be beneficial given stakeholder previous experience with monitoring and the potential for significant resource implications.

Response: DEQ is committed to public, stakeholder, and DMA engagement in the development of the Assessment and Monitoring Strategy.

H_T#2: Suggested Change ID #133

Description: Modeling - clarify inputs, CSO

Comment: Draft Technical Support Document Combined Sewer Areas

CSOs are predominantly composed of stormwater and THg loads associated with CSOs are considered to be already represented by estimates of THg load associated with urban stormwater. (p106) Clarification is needed as to whether and how contributions from CSOs were included in mercury loading calculations, and what "urban stormwater load" is being referenced in the text? Urban stormwater from outside of the CSO area, or urban stormwater from the CSO area? This clarification would provide a better understanding of modelling inputs to stormwater loads as well as aid in evaluating the effectiveness of the City's mercury minimization efforts managed under the MS4, NPDES wastewater, and UIC permits.

Response: The text regarding CSOs on page 104 of the Technical Support Document was clarified. Only the City of Portland provided boundaries of the combined sewer drainage areas, therefore only City of Portland CSO areas were removed from the area tabulated for MS4 loads at this time. CSOs during wet weather events are predominantly composed of stormwater, so total mercury loads associated with these CSOs are represented by estimates of total mercury loads associated with urban stormwater.

For the City of Portland, areas in the combined sewer drainage area were excluded from the MS4 load estimate. It was subsequently determined that the surface load from this area was instead incorrectly tabulated as part of the developed non-MS4 total mercury load for this HUC, leading to a minor over-estimation of the non-MS4 urban stormwater load (for the Portland area only). The change in load delivered to the outlet of HUC 17090012 was less than 1% with the removal of the surface load from identified combined sewer areas. Nevertheless, this portion of the load was removed from the final tabulations.

For CSO communities other than Portland, the diversion of total mercury loads to wastewater treatment plants in combined sewer areas cannot currently be accounted for as the combined sewer drainage areas were not provided. For these cities there is thus a small over-estimation of the MS4 total mercury load that could be accounted as part of the progress toward reaching the MS4 reduction target, if an analysis of the fraction of urban runoff entering the combined sewer system is evaluated.

H_T#3: Suggested Change ID #216

Description: Modeling - MOS is not quantified

Comment: The Margin of Safety (MOS) provided by the modeling has not been quantified. Section 11 of the draft TMDL document describes an implicit MOS due to the use of the northern pikeminnow as the fish species whose bioaccumulation determines the target concentration of mercury in the river system, the use of the median concentration from the FWM as the TMDL target concentration, and the use of total mercury concentration in fish tissue. These are conservative assumptions that provide a MOS, but the degree of conservativism achieved by these assumptions has not been described quantitatively. It is

therefore possible that the TMDL study may have produced an overly conservative target THg concentration for the Willamette River that has led to unnecessarily low load and wasteload allocations in the TMDL.

At a minimum, a table should be provided to show where each conservative modeling assumption was made that contributes to the total margin of safety. It is very important for DEQ, stakeholders and the public to understand the significant conservative assumptions being used in the TMDL development process. At a minimum, for the following three areas of the analyses, we quantitatively estimated the margin of safety and suggest this quantification is included in the document. • If the next most conservative fish species was used as the target (Largemouth Bass), the target instream total mercury concentration would be approximately 58% higher than the target concentration based on use of the Northern Pike Minnow (Table 4-4, page 56). • If the average value was used as opposed to the median value, the target instream concentration would be approximately 68% higher. (Table 4-4, page 56 for the NPM). • The TMDL analysis used total mercury concentration in fish tissue rather than the methylmercury in the criterion. As stated in the TMDL document on pages 70-71, "The total mercury in fish is composed of95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000), therefore using total mercury concentration in fish tissue rather than methylmercury increases the margin of safety because the methylmercury concentration will be slightly less than the total mercury concentration."

Cumulatively, these assumptions decrease the allowable concentrations by a factor of over 3.5 times (based on using the mean from the next most conservative fish species). It is essential for the public to know this when given the opportunity to evaluate the TMDL.

Response: DEQ agrees that the margin of safety was not quantified because DEQ used an implicit margin of safety, in conformance with the Clean Water Act. Section 11 of the TMDL was updated to better explain the components of the margin of safety and explanations of the conservative assumptions applied in addition to the margin of safety were also added to Sections 6 and 7.2.

The TMDL defined the target surface water total mercury concentration based on the Northern Pikeminnow, the most efficient mercury bioaccumulator among the species considered due to its high tropic level. The median total mercury concentration required to meet the fish tissue criterion (0.04 mg/kg methylmercury) in the Northern Pikeminnow is 0.14 ng/L. The observed median total mercury concentration for the Willamette River Basin is 1.2 ng/L, thus, an 88 percent reduction is required as described in Section 7.2. If the next most conservative fish species was used as the target, the Largemouth Bass (median total mercury target: 0.22 ng/L), a reduction of 82 percent would be needed. If the mean concentration for the Northern Pikeminnow (0.23 ng/L) is applied instead of the median, a reduction of 81 percent would be needed. However, application of either of these alternative concentrations as the surface water total mercury target is predicted to result in violations of the fish tissue criterion for the Northern Pikeminnow. This serves as a margin of safety for the TMDL because the Northern Pikeminnow is not a popular commercial or recreational target.

Another component of the margin of safety is that the total mercury concentration in fish tissue is applied, rather than the methylmercury concentration. As stated in Section 11, the total mercury in fish is composed of 95 percent or greater methylmercury in higher trophic level piscivores (USEPA, 2000). The methylmercury concentration in fish tissue will be slightly less than the total mercury concentration.

H_T#4: Suggested Change ID #237

Description: Allocations - General text revision

Comment: Section 10, Allocations: On page 61 of the TMDL, the next-to-last sentence of the first paragraph states, "The waste load allocations are used to establish effluent limits in discharge permits." Since the TMDL is not suggesting inclusion of numeric effluent limits in permits but rather narrative management practices to implement the wasteload allocations, this sentence should be revised to state that "the implementation strategy associated with the wasteload allocations is incorporated into discharge permits."

Response: DEQ did not make changes to the statement: "The waste load allocations are used to establish effluent limits in discharge permits." While it is true that DEQ is not establishing numeric effluent limits in wastewater permits, once the TMDL is acted on by EPA, DEQ will implement narrative water quality-based effluent limits in permits that are consistent with the assumptions and requirements of the wasteload allocation for the discharge prepared by the State and approved by EPA. This is consistent with the Code of Federal Regulations, EPA guidance and precedent on multiple other states.

H_T#5: Suggested Change ID #238

Description: Allocations - Table 10-1 PS clarification

Comment: Table 10-1 allocates a 10 percent reduction to NPDES Wastewater Point Source Discharges, but the TMDL applies this reduction only to major municipal NPDES discharges and excludes minor municipal facilities as de minimis and not subject to the 10 percent reduction. Table 10-1 should be explicit that only major municipal NPDES discharges are subject to the 10 percent reduction allocation. It would be helpful to be explicit on permit expectations (even if none) for de minimis sources to limit future confusion related to permit conditions. Also, any clarification of how the reduction would apply if a minor source becomes a major source due to growth or pretreatment would be helpful. Provide a note in Table 10-1 that clarifies the 10% NPDES wastewater point source discharges reduction applies to major municipal NPDES wastewater discharges only because minor municipal facilities are considered de minimis in other sections and not subject to the 10% reduction.

Response: DEQ did not make the requested changes to Table 10-1. The table correctly identifies the sector-specific allocation of a 10% reduction that is aggregated across all permitted wastewater discharges. Section 10.2 further specifies the permits covered under this sector and explains DEQ's rationale for aggregating the allocations, as allowed under the Clean Water Act (per 40 CFR 130.2(i)) and supported in multiple guidance documents and by precedent in multiple approved TMDLs from other states. Section 10.2 goes on to give a brief overview of the wasteload allocation implementation approach and notes that implementation details are specified in the Water Quality Management Plan, which is found in Section 13 of the TMDL. Section 13.3.2.1.1 provides the explicit information regarding permit requirements by permit type, as requested in the comment. DEQ determined that the WQMP is the appropriate location for such implementation details. Finally, as noted in Sections 13.6 and 14 of the TMDL, DEQ will monitor and evaluate progress toward the goal of attaining mercury water quality standards and intends to adaptively manage progress in attaining those goals, which can over time entail application of additional requirements within sectors, as warranted by evaluation results.

H_T#6: Suggested Change ID #243

Description: WQMP - Editorial - 13.3.2.1.3 remove permit implementation tools

Comment: 8. Section 13.3.2.1.3, Additional NPDES wastewater permit implementation tools: Since the WQMP does not recommend including effluent limits in NPDES discharge permits, this section on variances and intake credits is not relevant and could lead to confusion. DEQ should remove this section from the final WQMP.

Response: DEQ agrees with the comment and removed Section 13.3.2.1.3.

H_T#7: Suggested Change ID #245

Description: TSD - Table 5-9 average flows

Comment: Table 5-9: Table 5-9 apparently includes a mix of actual and design flows presented in the "Average Flow" column. Actual and design flows can differ substantially. Since the purpose of the evaluation is to estimate current mercury loads, it would be more appropriate to use actual flows rather than design flows.

Response: DEQ compiled submitted flow monitoring records and provided the compiled data to EPA's contractor, Tetra Tech, to be used for establishing existing mercury loads. If available, actual effluent records were used to estimate an average annual discharge for a facility. However, no flow records were available for the four Clean Water Services facilities: Durham, Forest Grove, Hillsboro, and Rock Creek. Therefore, flow information submitted to DEQ in 2017 as part of the variance applications for the four Clean Water Services wastewater treatment plants was applied. This is discussed in Section 5.3.5 POTW Sources in the TMDL Technical Support Document and presented in the table notes for Table 5-9. The TMDL Technical Support Document was revised to further clarify the use of design flows for these select facilities.

H_T#8: Suggested Change ID #247

Description: Modeling - input clarification

Comment: Stormwater modeling: DEQ should provide more information in the Technical Support Document on the approaches and data used for stormwater modeling. In particular, the areas used for MS4 modeling should be provided, along with the jurisdictions used in the model, the impervious areas and estimated effective impervious area used. Understanding these model inputs is critical for developing benchmarks and conducting future PLREs and WLAAs. Having these inputs will allow meaningful comparisons to the modeled current loads.

Response: Spatial data used in the MS4 modeling will be made available from DEQ websites with the issuance of the TMDL and provided to DMAs for use in implementation.

H_T#9: Suggested Change ID #251

Description: WQMP - Urban vs. Rural Streams

Comment: Section 13.3.1.11 Local Government: Urban vs Rural Streams:

In the TMDL, it is important to be clear and consistent when using the terms urban and rural to describe streams and runoff. The draft WQMP incorrectly refers to "urban streams" when it is focused on a discussion of rural areas. And rural stormwater runoff is consistently and incorrectly referred to as urban runoff, and assumed to be of similar quality when data and published reports indicate otherwise.

Response: DEQ agrees that it is important to be consistent with references to urban and rural stormwater runoff in the WQMP and has revised the WQMP accordingly.

H_T#10: Suggested Change ID #260

Description: Reserve Capacity - describe how reserve capacity would be available with sector specific percent reduction allocations

Comment: Section 12 on page #72 ("Reserve Capacity"): Reserve capacity is an allocation for potential increases in mercury loads from new or expanded sources. This section says reserve capacity may be granted to NPDES permitted point sources and/or nonpoint source designated management agencies and responsible parties. It is not stated how the reserve capacity would be made available for new or expanded sources in a TMDL that includes sector-specific percent reduction allocations. Clarify how the reserve capacity would be made available for new or expanded sources in a TMDL, including sector-specific percent reduction allocations. Please also confirm that the groundwater comment provided above will not be determined as utilizing the entirety of the reserve capacity.

Response: In response to other comments, DEQ removed nonpoint sources for consideration for reserve capacity. This is because all potential nonpoint sources of mercury were captured through the land use evaluation process and, though ownership or land activities may change, no new nonpoint source areas are anticipated to be identified. As explained in Section 12 of the TMDL, DEQ will require demonstration of effluent condition and implementation of DEQ approved mercury minimization measures prior to a determination on allocating a portion of the 1% reserve capacity. This evaluation will occur prior to or during the permit application process for any new point sources or during the permit modification or renewal process for any expansions of existing permitted facilities. DEQ clarifies that reserve capacity is an additional 1% of the relative allocation of load capacity by sector (as shown in Table 10-1), from which portions can be allocated in addition to the sector specific percent reduction allocations.

H_T#11: Suggested Change ID #282

Description: Allocations - Table 10-1 - math error - page 61

Comment: There is an error in the math of the fourth equation on page 63. 42.17 g/day — 0.42 g/day = 41.75 g/day not 41.58 g/day.

Response: Correction made in report. Change 41.58 to 41.75

H_T#12: Suggested Change ID #289

Description: WQMP - Section 13.3.2.2.1 MS4 Phase II Permittees - responsible authority clarification

Comment: Clarify whether developing a control measure effectiveness monitoring strategy applies to entities that choose to implement a mercury minimization plan to meet TMDL requirements as opposed to Phase II jurisdictions covered under an individual permit. If it applies to the former, express it as a bulleted item along with the other required plan elements. Otherwise provide rationale that would make these jurisdictions in greater need of monitoring than a general MS4 Phase II permittee.

Response: DEQ corrected the typo of a missing bullet point to indicate that the requirement of a control measure effectiveness evaluation strategy would be applicable to MS4 Phase II entities upon renewal of an individual permit.

H_T#13: Suggested Change ID #294

Description: Appendix A - Target Fish Species

Comment: Northern Pikeminnow is not an appropriate target fish species due to limited human consumption and establishes an unrealistic goal for the TMDL. Convey a more accurate picture of fish consumption considerations in the Willamette River basin by using a more widely consumed fish or an analogue fish. Equate the use of the Northern Pikeminnow in terms of the margin of safety factors that would otherwise be applied to the use of a salmonid or other widely consumed fish.

Response: The justification for using the Northern Pikeminnow is given in Section 11 of the TMDL document.

H_T#14: Suggested Change ID #295

Description: Appendix A - Biomagnification Factors - Table 3-5 Correction

Comment: Values used for WRB Cumulative BMF are incorrectly listed as medians but are actually 95th percentile values as pulled from Table 3-3. This impacts Figure 3-7 as well. This relates to Table 6.2 and Figure 6.2 in the TMDL document as well. Were the median values or the 95th percentile values used in moving forward with the translator model? This has important implications in understanding the margin of safety.

Response: There was an editing error in Table 3-3 of the TSD: the values in the Median column are actually the 10th percentile values and the values in the 95%le column are actually the median values. The correct median values are shown in Table 3-5 and Figure 3-7 of the review draft. The error in the TSD table was carried forward into Table 6-2 in the TMDL, while Figure 6-2 in the TMDL is correct. The incorrect tables have been updated in the documents.

Note that the correct median BMFs were used to calculate the water column THg target concentrations via the Translator in Table 4-4 of the TSD and Table 6-4 of the TMDL, and subsequent TMDL calculations are not affected. However, the column for the lower 95% confidence levels in these two tables mistakenly repeat the median values and have also been updated.

Incorrect columns were also pasted into Table 3-4 of the TSD and have been updated.

H_T#15: Suggested Change ID #298

Description: Appendix A - Mercury Concentrations Reflective of POTW Discharges

Comment: Because median mercury concentration of 2.6 ng/L was used by DEQ to characterize mercury levels for minor municipal facilities when data were not available, this concentration should be used for all facilities where data were not available. The Technical Support Document and table 5-9 (page 89) notes that 11.7 ng/L was used in the model for some POTWs resulting in high modeled mercury concentrations.

Justify the substantially higher concentrations noted in the report or the Wilsonville, Portland (Tryon Creek), and Salem facilities

Response: Table 5-9 identifies POTW facilities lacking mercury monitoring data. To estimate an existing load for a facility lacking site-specific mercury monitoring data, a representative concentration was established using data available from facilities of similar type and size in the Willamette River Basin. More specifically, mercury data from facilities with the same NPDES domestic major class (e.g., NPDES-DOM-C) were applied because the plant capacities are designed to treat similar flow rates. The relatively higher concentrations applied for Wilsonville, Portland (Tryon Creek), and Salem facilities are all based on available facility-specific monitoring records – thus, the concentrations applied are based on the best available data provided by DEQ and represent actual effluent conditions observed at these facilities.

H_T#16: Suggested Change ID #328

Description: Reserve Capacity - Further explanation of how 1% Reserve Capacity is derived

Comment: Comment regarding Section 10 (Allocations): With respect to incorporating Reserve Capacity, the write up and methods are confusing and subjective. With respect to footnote #3 in Table 10-1, it is not clear how an additional 1% reduction from atmospheric deposition would be available for reserve capacity nor how it will be achieved. Could you please provide further detail as to how the 1% number was derived?

Response: DEQ clarified the footnote in Table 10-1 that reserve capacity is not entirely dependent on reductions in atmospheric deposition of mercury. Rather, 1% of the allocated loading capacity will be reserved for any needed capacity for new or expanded point sources. As noted in Section 10.2 of the TMDL, The 11 percent reduction for atmospheric sources is anticipated to occur through controls on local emissions within Oregon, but to greater extent through on-going reductions being achieved nationally (United Nations Environment Programme, 2019) and in the future through enactment and implementation of international treaties. This reduction in atmospheric sources is well below the reduction used in approved mercury TMDLs throughout the US, which range from 67 percent to 90 percent (Limno Tech,

2018; North Carolina Department of the Environment and Natural Resources, 2012; Minnesota Pollution Control Agency, 2007; New England Interstate Water Pollution Control Commission, 2007).

H_T#17: Suggested Change ID #329

Description: Modeling - Effects of seasonal variation on CSO Communities

Comment: Section 8 discusses how seasonal variation was explicitly considered in the mass balance model by accounting for climate, land management, reservoir operations, and vegetation. The commenter states that it does not appear the impacts on CSO communities due to seasonal variation have been accounted for in the modeling. Commenter requests that CSO facilities be considered since mercury concentrations may vary considerably between wet and dry seasons.

Response: Delineated combined sewer areas were excluded from the load tabulations, however, only the City of Portland provided a coverage designating areas draining to combined sewers. So only Portland CSO drainage areas were removed from the tabulation. CSOs during wet weather events are predominantly composed of stormwater, so total mercury loads associated with these CSOs are represented by estimates of total mercury loads associated with urban stormwater. For wastewater treatment plants that are permitted to discharge in the Willamette River Basin and receive influent from combined sewers, representative average annual loads were established from site-specific effluent records (available flow and mercury concentration data). Thus, the representation of seasonality varies by facility based on available records (e.g., seasonality is better represented for facilities that provided flow and mercury data spanning multiple years and seasons).

H_T#18: Suggested Change ID #330

Description: Allocations - Allow POTWs who show they've already implemented effective MMP for 10% reduction to be exempt from further reductions

Comment: to achieve the 10% reduction, major domestic sewage treatment plants will have to implement Mercury Minimization Plans (MMPs) and monitor their mercury discharge to calculate a percent reduction. Many majors have made considerable efforts already to minimize their mercury loadings and therefore an additional 10% may not be achievable. For instance, through public outreach, education and collection events, the City of Corvallis has achieved a 98% reduction in mercury loadings over the last 10 years. When the City's NPDES permit is renewed we will have a MMP showing that we plan to continue these activities and implement additional measures to reduce the mercury loading further. Because of our existing and past efforts it seems unlikely that we will achieve an additional 10% reduction.

Response: DEQ clarifies that individual major municipal wastewater treatment facilities will not need to demonstrate a 10% reduction in mercury in permitted discharges. Rather, the 10% reduction wasteload allocation is aggregated across all permitted wastewater discharges, with requirements for mercury minimization plans and monitoring applied to major sewage treatment plants and select industrial dischargers with comparable loads and prohibition of suction dredge mining discharges in tributaries to Dorena Reservoir. DEQ acknowledges that some permitted wastewater facilities have more mature programs on mercury minimization than others. Thus, DEQ anticipates that the aggregated wasteload allocation will be met by continued efforts from mature programs and enhanced efforts by the less mature or nascent programs.

H_T#19: Suggested Change ID #331

Description: WQMP - Section 13.4.1 Implementation Plan Timeline Coordination

Comment: As part of the Willamette River Basin TMDL five-year review, implementation plans were recently updated and submitted to DEQ in late 2018 and early 2019. Please consider lining up the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance.

Align the timeframes for the next five-year reviews for both the recently submitted plans, and the plan that will be required 18 months following TMDL issuance. Allow an additional time frame for county implementation of six minimum measures in Table 13-11 due to expansive geographies and overlapping jurisdictions.

Implementation plans (Section 13.1.1)

TMDL Text: DEQ typically gives DMAs and responsible persons 18 months to submit new or updated implementation plans following the issuance of a TMDL and WQMP. For this WQMP, DEQ will continue using the 18-month time frame for implementation plan submittal. For point sources, wasteload allocations and/or other management strategies identified in the TMDL and WQMP will be incorporated into renewed NPDES permits as enforceable provisions. (p. 73-74) MS4 permit holders must also develop and submit a TMDL implementation plan that demonstrates how nonpoint source load allocations will be met. This plan must include management strategies to reduce runoff and erosion that discharge directly to waterbodies. (p97)

Comment: Clarification is needed around these statements and associated requirements. The City and others just submitted updated TMDL Implementation Plans as required by DEQ following the recent 5-year review. Portland's implementation plan (dated March 1, 2019) already covers mercury and describes strategies that the City is using to address this and other TMDL pollutants. Will the City be required to re-submit this plan in 18 months? Please clarify or amend the requirement to make an exception for DMAs that already have TMDL Implementation Plans that address mercury.

Response: DEQ agrees that keeping the five year reporting cycle consistent between the Willamette Basin TMDLs will be more efficient. The last five year review for the Willamette Basin occurred in 2018. The next five-year review will occur in 2023 and will include implementation activities related to the 2019 Mercury TMDL. In other words, the next five-year review will include information about mercury-related strategies that some DMAs started implementing in the middle of their current five year cycle. The objective of this timeline is to retain a consistent five-year reporting cycle for current and future Willamette Basin TMDLs. Some designated management will continue to have alternate five year cycles based on previous implementation and reporting schedules, for example DMAs in the Molalla-Pudding subbasin.

Following the issuance of the mercury TMDL, updated TMDL implementation plans to meet the WQMP will be due within 18 months (i.e. around May 2021 if TMDL approved by end of November 2019). DEQ basin coordinators will review and approve updated implementation plans to ensure plans meet requirements in the revised mercury WQMP. Depending on the content of the implementation plan, some DMAs may already meet requirements, while others will not. It is likely that DMAs will need to make some updates to align with the WQMP, including development of measurable objectives if absent. The

implementation plan may also need language to clarify how a DMA's existing MS4 or other program meets the WQMP.

H_T#20: Suggested Change ID #332

Description: TSD - Table 5-9 Weight current data higher than older data

Comment: Section 5.3.5 explains the variety of sources referenced for the data in Table 5-9 but does not specify the date range of the data for actual data collected. In the last decade, many communities have made efforts to minimize both water usage and mercury, therefore the older the data the higher both values are likely to be for any given municipality.

Table 5-9 should be amended to include the date range of the data collected if the data is from actual values and that data should be within the last five years if at all possible. Current data (within the last five years) should be weighted higher than older data (greater than five years) due to its relevancy.

Response: Effluent records from the period of 2002 to 2017 were used to estimate average flows and THg concentrations for POTW facilities, although most available effluent data were post-2003. The effluent records from this period were then used to link mercury source loads to mercury concentrations observed during the period of 2002 to 2017 in tributaries and the Willamette River to fish tissue. DEQ requested mercury monitoring records from facilities during the TMDL development process and recent monitoring was incorporated into the assessment when and where available.

H_T#21: Suggested Change ID #333

Description: TSD - Table 5-9 Review and revise data for POTWs to correct inaccuracies

Comment: A cursory review of the data suggests that the annual average flow and mercury concentrations for some POTWs is inaccurate. Table 5-9 lists the average flow for the City of Corvallis as 4,131 MG/yr with an average mercury concentration of 6.8 ng/L. The actual flow for the last five years (January 2014 through December 2018) was 3,895 MG/yr and the mercury concentration was 4.4 ng/L. This equates to a load of0.065 kg-Hg/yr, 39% lower than the value of 0.106 listed in table 5-9 (all data used to derive this loading can be found in DMR monthly reports and annual pretreatment reports from 2014 through 2018). Also the City of Salem's flow data is inaccurate. The flow for the Salem facility is specified as 690 MG per year in Table 5-9, which equates to daily average flow of 1.9 MGD. The City of Salem operates a treatment facility with an annual average flow of 15,085 MG per year. Flows from this facility are considerably higher than presented in Table 5-9.

Furthermore, Table 5-9 specifies very high mercury concentrations for the Wilsonville, Portland (Tryon Creek), and Salem facilities. There is nothing unique about these facilities that would justify the substantially higher concentrations noted in the report. This is likely due to the use of higher quantitation levels resulting in a mix of censored and uncensored data. DEQ should revise the data for both the City of Corvallis and Salem facilities, update the table with current data where possible and verify the accuracy of the data used for Wilsonville, Portland, and all POTWs presented in Table 5-9.

DEQ acknowledges that facilities have differing levels of maturity of mercury minimization programs and some facilities that have applied strategies to reduce mercury loads from those represented in the TMDL assessment.

Response: DEQ compiled mercury and flow monitoring data received from POTW facilities, which were applied in the quantification of existing mercury loads. As described in Section 5.3.5 of the TMDL Technical Support Document, representative average annual flows were derived from years with complete (or nearly complete) records. As noted in Section 2.0 of the TMDL Technical Support Document, the technical assessment for the TMDL applied the period of 2002 to 2017 to characterize existing loads. Available records from City of Corvallis spanned 2004 to 2017; however, flow records were only complete for 2012 to 2016. Annual flows for these years ranged from 3,030 MG/yr to 4,799 MG/yr with an average discharge of 4,131 MG/yr, which was applied as the representative average flow for the facility. Mercury data collected between 2005 to 2013 (all within the defined technical assessment period) were available and applied to establish the representative historic concentration.

The flow records available for City of Salem for the development the TMDL Technical Support Document spanned December 2004 to June 2017. However, about 90 percent of the daily flow records have observed values of 0 MGD listed. Days with non-zero flows reported were used to compute the average annual flow for the facility.

Actual mercury monitoring records from Wilsonville, none of which are flagged as censored, were applied to compute the facility's average mercury concentration. Actual mercury monitoring records from Portland (Tryon Creek) were also applied directly and less than 3 percent were flagged as censored. Multiple mercury samples from Salem were censored thus, the Kaplan-Meier method was used to address non-detects as discussed in Section 5.3.5. Therefore, the concentrations applied represent available site-specific mercury monitoring.

H_T#22: Suggested Change ID #334

Description: References - Add Definitions

Comment: Recommend including a "Definition" appendix similar to recent MS4 phase II permit. This could greatly avoid confusion in several sections. Include such terms as "Relative Allocation of Load Capacity."

Response: Comment acknowledged.

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82. Comments from: Rosa, Jerome

Rs_J#1: Suggested Change ID #178

Description: WQMP - Conveyance entities - How to separate sedimentation resulting from conveyance systems from that resulting from upland agricultural activities

Comment: Specific to impacts due to modeling used in the load allocations impacting our members, it is worth noting that while DEQ states water conveyance entities "are responsible only for sedimentation resulting from conveyance systems, not from upland agricultural activities," it is unclear how this separation will be made since there is no data allocating mercury to alleged water conveyance activities versus upland agricultural activities. We are concerned this approach may lead to conflict between the named entities, stymieing the types of collaborative partnerships and projects needed to make real progress in improving Oregon's water quality.

Response: DEQ is not requiring water conveyance entities to conduct water quality monitoring at this time, however they will be responsible for submitting TMDL implementation plans to DEQ that clearly show best management practices are/ will be utilized to reduce erosion and sediment movement during operation and maintenance of the system. Water conveyance entities that fully implement their DEQ-approved TMDL implementation plan will be considered to be in compliance with the TMDL.

In addition, DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. The Assessment and Monitoring Strategy will not be focused on determining trends in water quality parameters specifically associated with operations and maintenance of water conveyance systems, rather this strategy will help DEQ characterize water quality trends within HUC8 watersheds. Some water conveyance entities have implementation planning and reporting requirements to DEQ. If water quality trends within a HUC8 watershed are shown not to improve over time due to sources under authority or control by DMAs or responsible person, DEQ will require revision of designated management agency and responsible person implementation plans to better address mercury loading.

Rs_J#2: Suggested Change ID #221

Description: Modeling - MBM - Acknowledge uncertainty in models, perform additional model simulations

Comment: Summary of suggested change: acknowledge model uncertainties in the calculation of existing loads in the TMDL, perform additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. The Mass Balance Model (MBM) exists separately from the FWM and the Translator Model. Whereas the FWM and Translator Model are used together to determine the target THg concentration in the water column, the MBM determines the present-day contributions of THg to the Willamette River system from a variety of sources. These values are compared to the THg loading capacity (discussed below) when developing the load allocations of the TMDL. The representation of nonpoint sources in the MBM raises the following concerns: -Results of three other models serve as important inputs or points of comparison for the contributions of nonpoint sources to the Willamette River system. These models are: -the hydrology model of the Willamette Basin created by the EPA contractor several years ago using the software package HSPF, -the model of dry atmospheric deposition of mercury used by Domagalski et al. (2016), and -the USGS LOADEST model from which the EPA contractor calculated THg concentrations in the Willamette River that were then used as a calibration target for the MBM. For this reason, the TMDL will be based on six models, not the three commonly described by your team, the EPA, and its contractor. Using the output of two models as inputs of the MBM compounds uncertainty. Calibrating to the results of a separate model implies that the MBM is calibrated to match a number with its own, presently unquantified, uncertainty. While this may be unavoidable, we do not find an acknowledgement of these uncertainties in the calculation of existing loads in the TMDL. It would be appropriate to perform

additional model simulations with reasonable upper and lower bounds of, for example, atmospheric deposition or soil mercury concentrations. No such calculations are described in the TMDL document (or the Technical Support Document), which reports single numbers (i.e., values with no associated uncertainties) in Table 6-7. The lack of an acknowledgement of the uncertainty in the MBM decreases our confidence in the existing loads and the subsequent calculations that use them.

Response: Requirements for the revised TMDL were detailed in the court findings of Magistrate Judge Acosta and include "an analysis of factors affecting mercury pollution, including potential multiple sources, bioaccumulation patterns, and changes in the types of mercury being released and transformed in the entire complex river system." In addition, modeling to support the TMDL update "must be revised and incorporate all the new data related to mercury that has been gathered since the first TMDL…" These requirements were met because the modeling and technical assessments for the TMDL revision incorporated new mercury monitoring data (e.g., water column, sediment, fish tissue, point source effluent, etc.), as well as relevant information from recent research and modeling efforts.

DEQ acknowledges that there is uncertainty related to the modeling and analysis that was completed for the Willamette Mercury TMDL. However, DEQ finds the modeling and analysis is suitable for TMDL development and is sufficient for implementing the TMDL and meeting water quality criteria. The modeling and analysis is consistent with DEQ's mechanistic understanding of mercury and methylmercury in the basin. Potential uncertainties and how they were addressed are discussed in the following sections of the report: 6. Explanation of Models; 7.2 Excess Load; and 11. Margin of Safety. The Technical Support Document provides a detailed discussion of the data sources used in the TMDL analysis. The data used for development of the Food Web Model and mercury translator are discussed in section 2 of the Technical Support Document. The data sources and methods used to estimate the sources for the mass balance model are discussed in section 5.3 of the Technical Support Document.

DEQ intends to use additional monitoring and modeling during implementation of the TMDL to improve upon the representation of mercury/methylmercury system in the Willamette Basin. DEQ is working with EPA and watershed partners to develop an Assessment and Monitoring Strategy in the Willamette Basin that will help to reduce uncertainty in DEQ's representation of mercury in the basin, as well as support more robust decision-making regarding implementation of the Mercury TMDL. As discussed in Sections 13, 13.6 and 14 of the TMDL/WQMP, data collection will continue and expand to allow for further analysis to better represent mercury sources and transport and transformation mechanisms – such as methylation in reservoirs, bioaccumulation, and groundwater mercury concentrations. It is expected that the implementation of the TMDL will be further refined over time as part of an adaptive management process.

Rs_J#3: Suggested Change ID #311

Description: General - fairness of TMDL for pollutant originating outside of OR

Comment: TMDL seeks to regulate a pollutant that regulated parties have no control over, and which originates from outside of OR and United States.

Response: DEQ is proposing the TMDL because many streams in the Willamette Basin are impaired by too much mercury and fish consumption is restricted by the Oregon Health Authority. When streams are listed on the 303(d) list of impaired waterbodies, development of a TMDL is required. Land and water managers have a responsibility to implement strategies and actions that reduce their impact on water quality. While the primary source of mercury in the basin is air deposition of mercury that comes from

global sources, there are also sources within the basin and there are actions that land and water managers can take to reduce the amount of mercury and sediment that enters rivers and streams. Collectively, actions to reduce inputs of mercury and sediment will help to improve water quality.