

**Response to Advisory Group Comments on
Draft SFPR Fecal Coliform Bacteria TMDL –
Technical Section
Revised due to additional comments 3/27/09**

Location (Page #)	Comment	Response
General	There are a number of places in which SD120 on Missouri Flat Creek is listed as having elevated coliform levels and associated targeted coliform reductions. There should be a caveat that if the coliform is naturally occurring in Lake DePuddle these targeted reductions may not be achievable.	The water quality standards allow for naturally occurring FC to exceed the numeric criteria. The implication is that there is no further allowance or degradation caused by humans beyond the natural levels. The sampling performed by Pullman on the water body by Chief Joseph Apartments has not shown that it is the cause of high counts and loads at the stormwater outfall. Nor has it shown that the FC counts are from natural sources. Some natural sources may be concentrated due to human land uses.
Page 14, 1 st paragraph	Replace “guts” with “intestines”.	Revised language.
Page 14, 2 nd paragraph	Delete extra line.	Revised language.
Page 20, last paragraph	“ <i>Usually these sources are dispersed and do not elevate FC bacteria counts over state criteria.</i> ” This is opinion, not fact, and one that I would dispute. If the feces from 100 dogs dispersed over a 26-sq. mile watershed over 2-3 days is enough to close down a bay to swimming and shellfishing” (www.stormwatercenter.net), then I would argue that wildlife sources (i.e. one beaver pond in a small stream with low flow) could potentially contribute to pushing fecal bacteria counts over the state criteria. Either cite your source for this comment or delete it.	Revised language.

Pullman (Rob Buchert/Kevin Gardes & Tom DuPuis-consultant)

Page 26, Table 5, row 7	Replace “Hadley Ck.” with Hatley Ck.	Language revised
Page 28, Table 6, Apply to whole Table	Correct to read: Bishop Blvd. (not Rd.); Grand Ave. (not Blvd.); Hatley Ck. (not Hadley)	Language revised
Page 32, last sentence	Delete “in”.	Language revised
Page 44, 1 st sentence	Delete “a”. “...SF Palouse a just above the City of Pullman.”	Language revised
Page 47, 6 th paragraph	“ <i>Presumably storm drains should not have summer baseflow, unless it carries a historically natural drainage, has groundwater infiltration, or has an illegal connection of some kind.</i> ” Add: Pullman has many natural springs that contribute year round baseflow to its storm drain system.	Added: “...or has a natural spring that may contribute to year-round baseflow.”
Page 49, Figure 13	Replace “Hadley Ck.” with Hatley Ck.	Language revised
Page 50, Figure 14	Replace “Hadley Ck.” with Hatley Ck.	Language revised
Page 55, 1 st & 3 rd paragraphs – 3 locations	Replace “Grand Blvd.” with Grand Ave.	Language revised
Page 69, last paragraph	Delete “(some may believe this to be the historical Lake DePuddle)”. Add: Recent sampling by City of Pullman staff identified this lake as a potential significant source of fecal coliform bacteria entering the City’s storm drain system. As the outflow of this lake flows into the city's storm drain system it may be problematic to reduce coliform levels to WQ standards in this section of the storm drain system if the coliform is naturally occurring.	Deleted reference to Lake DePuddle. Ecology did not add the results of the Pullman bacteria sampling to the TMDL report. The TMDL only reports on the data that is quality assured and complete. The sampling that Pullman did identify high counts in the water body by the Chief Joseph Apartments, but those samples need to be put into context with counts and loads measured throughout the SD120 stormwater collection system to draw any conclusions.
Page 74, 2 nd paragraph, 3 rd bullet	Replace “Grand Blvd.” with Grand Ave.	Language revised

Page 74, 3 rd paragraph	Replace “Grand Blvd.” with Grand Ave.	Language revised
Page 79, Table 24	The Pullman WWTP is listed as having a 15% dry season target reduction, but on the following page it says that the current permit limits should be sufficient. So do we need a targeted reduction at the plant if we are meeting our discharge standards?	The TMDL sampled two sample counts above the permit level during the dry season of 2006. The 15% reduction is the target reduction necessary from the sampled 2006 levels needed to meet the water quality standards. The permit limit does not need a reduction, but it does need to be met.
Page 83, Table 29	Check with Jeremy Ryf – Ecology ERO Industrial Permit Manager for status of UPS permit. UPS was in process of becoming exempt from industrial permit.	Deleted UPS for the table.
Page 84, Dry Fork Creek, 1 st bullet	Replace “Grand Blvd.” with Grand Ave.	Language revised
Page 85, Paradise Creek, 2 nd bullet	Not sure what is being said here.	Reworded to clarify.
Page 85, Missouri Flat Creek, 2 nd bullet	It would be helpful to have some mention of the city's sampling here (low levels into Lake DePuddle, high levels out), even if it is just in general terms.	See above.
Page 85, Stormwater Analysis for Pullman and WSU	Are these conclusions based on one storm event? If so, the results may be different with other storm events. In particular the statement "Storm events and storm runoff greatly increased FC bacteria pollution and degraded the water quality"	The mass balance within the city of Pullman was based on one storm event. Comparison of water quality at three outfalls during four different storm events suggest that water quality can be similar among storm events of varying magnitude in Pullman. To comply with EPA, Ecology must develop a numeric WLA for stormwater for Pullman and WSU in this TMDL. EPA knows that stormwater data may be limited and allows rough estimates to be calculated. Ecology used the data available to estimate the stormwater water quality

		characteristics and impacts. The simple qualitative conclusion is that stormwater has an impact on water quality in Pullman. The quantitative estimates may be further refined from additional stormwater monitoring. Bacteria reductions from stormwater are needed.
Page 85, Stormwater Analysis for Pullman & WSU, 2 nd bullet, 3 rd sub-bullet	Replace “Grand Blvd.” with Grand Ave.	Language revised
Page 86, Figure 29	Replace “Hadley Ck.” with Hatley Ck.	Language revised
Page 87, Figure 30	Replace “Hadley Ck.” with Hatley Ck.	Language revised
Page 89, Dry Season, Note 3	If we are meeting the permit limit why would the plant be included in the implementation prioritization?	The plant did not meet the permit limits in dry season of 2006.
Page 90, Note 4	Another Grand Blvd. reference.	Language revised
Page 91, 5th bullet from bottom	Add to the sentence, "and whether naturally occurring coliform levels in Lake DePuddle are contributing to the WQ exceedances."	See above. Ecology presumes an investigation would look for all sources, including natural sources.
p. 14, Fig 2	Should be further discussion in text noting that O157:H7 strain of E. coli is what is typically associated with contaminated food-related outbreaks, and are not likely to result in water-borne outbreaks that might occur as a result of exposure to the streams and rivers in the study area	Further discussion was added: “While E. coli O157:H7 is most often associated with food contamination research indicates it can be transported through watersheds via runoff and streams and survive in sediments (Cooley et.al, 2007).” www.plosone.org/article/info:doi/10.1371/journal.pone.0001159
p. 16, last para	The absolutist statement that: if natural sources cause exceedances then there is no allowance for human sources, does not seem realistic or at least needs further substantiation by citing some WA regs to back it up. That is	Washington’s Water Quality Standards [Chapter 173-201A-260 (1)(a) of the Washington Administrative Code (WAC)] states “It is recognized that portions of many water bodies cannot meet the assigned criteria due to the natural conditions of

	<p>what a TMDL is for, to slice up the capacity pie. EPA has a bacteria standard implementation guidance document that suggests additional regulatory flexibility may be warranted in these situations.</p>	<p>the water body. When a water body does not meet its assigned criteria due to natural climatic or landscape attributes, the natural conditions constitute the water quality criteria.” If natural levels are the criteria that determines the loading capacity (the TMDL pie). Then there is no room (additional slices of the pie) left for other sources. However, that does not mean that activities and best management practices, such as riparian restoration, cannot reduce natural sources (such as wildlife congregating in areas that would not have happened in a more natural landscape), thereby creating additional capacity for human sources.</p>
<p>p. 21, last para</p>	<p>The issue and discussion of reactivation and re-growth here and elsewhere obviously may have significant implications for Pullman (and Moscow). A more complete discussion is needed here, including the many many caveats and qualifiers, and additional information that has come out since the 2002 reference they cite. Notably, if regrowth does occur, why suggest it is only POTW FC that may be subject to that?</p>	<p>See response below.</p>
<p>bottom p. 46 and top p. 47</p>	<p>Per the comment above, here they suggest reactivation/regrowth of bacteria from your effluent is likely the source of the unknown load increase. Of course there may be many other possible sources in this 1.3 mile reach. I think it would be in Pullman's interests to point out what these might be</p>	<p>Reactivation and regrowth are one possible source in this reach but Ecology is not suggesting it is the only possible source. Ecology recommended in the report that further investigation is warranted.</p>

	to the extent that you can now based on what you know. If you think it very likely that there are no other sources or have no good info on that, then we should talk some more about how one goes about further validating or disproving that theory. It is highly speculative at this point in my mind. [Hatley Creek comes in below Pullman's outfall. There also could be livestock in this area at times.]	
p. 48, Table 15	The dry weather FC concentrations upstream of your plant are higher than those in your effluent, and your effluent is lower than those at the RM 21.5 site. That suggests to me that you are a dilution source (not sure why they show that NPS load in 13, would need to spend a little more time crunching the numbers), and that it is certainly possible that if regrowth is occurring (a very big IF) that it could just as well be bacteria from other sources.	Reactivation and regrowth are one possible source in this reach but Ecology is not suggesting it is the only possible source. Ecology recommended in the report that further investigation is warranted.
p. 51, para 5	Here they're pointing finger at re-growth of Moscow POTW FC. [Could also be other sources. Similar to comments above]	Reactivation and regrowth are one possible source in this reach but Ecology is not suggesting it is the only possible source. Ecology recommended in the report that further investigation is warranted.

	p. 81, Table 27	FC concentrations in SW are very typical of runoff from urban areas and streets, not indicative of significant pollution from human sewage such as leaky sanitary sewers, cross connections or major septic failures. Yes, concentrations measured are above the criteria, but are very typical of pretty "clean" MS4s. I think it important that this be put in context in this report, to reinforce an implementation approach that fosters reasonable MS4 BMPs.	The goal of the TMDL is to achieve the water quality standards. Point sources, including stormwater outfalls, inside a TMDL study area must receive wasteload allocations.
	p. 83, 1st para	The statement that industrial and construction sites covered by GPs have low potential for contributing or transporting FC needs further substantiation. It really depends on what kinds of industries and sites, and what kinds of BMPs they have in place.	Construction sites and the industrial facilities listed in Table 29 do not produce sources of bacteria that would be washed off their sites during a storm event.
	p. 94	Ask Ecology for a copy of the Rifai and Jensen, 2002, document. I would like to review this in relation to the other info I have on reactivation and re-growth.	http://www.tceq.state.tx.us/assets/public/implementation/water/tmdl/22buffalobayou/22-whiteoak-wo1report.pdf

WSU (Marty O'Malley, Gene Patterson, John Reed, Dwight Hagihara)	Page 14, Impaired beneficial uses and ...	Add a section explaining how the South Fork of the Palouse River was designated for <i>Primary Contact Recreation</i> use, the designation criteria used and how the designation was made. Was the designation made with input from the stakeholders in the watershed?	Referenced added to the text. Per Chapter 173-210A-600(1) WAC streams not assigned specific designated uses are to be protected for salmonids spawning, rearing, and migration; primary contract recreation; domestic industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values. Primary Contact Recreation protects for activities where a person (including children) would have direct contact with water to the point of complete submergence. Ecology observed residents swimming in the South Fork Palouse River in 2006.
	Page 16, first paragraph	Fecal coliforms are not restricted to the gut of warm blooded animals but can reproduce in the environment. Would analyzing for <i>E. coli</i> be a better indicator of fecal contamination for future monitoring programs?	Fecal coliform bacteria are produced in the guts of warm blooded animals but it is true that they can survive and reproduce in the environmental. The purpose of the TMDL is to reduce bacteria entering the stream so that they do not reproduce in the environment. Split samples (<i>E. coli</i> vs. fecal coliform) were taken at the Idaho/Washington Border location on the South Fork Palouse. The results suggest that the relationship (ratio) of <i>E. coli</i> to fecal coliform was very strong.
	Page 19, Stormwater, second paragraph	Add: "Phase II stormwater regulations expanded the requirement for stormwater permits to all municipalities located in urbanized areas	Population criteria added to text.

		with populations of more than 50,000 and to construction sites ...”	
	Page 63, first paragraph, last line	please add “... nearer to compliance during the dry season except for the excessive loading from Colfax.”	Added.
	Page 69 – 76, “Phase II Stormwater Evaluation for Pullman and WSU”	To make conclusions on limited sampling data only from Pullman/WSU during storm events is not defensible and more sampling data is needed throughout the water shed.	The mass balance within the city of Pullman was based on one storm event. Comparison of water quality at three outfalls during four different storm events suggest that water quality can be similar among storm events of varying magnitude in Pullman. To comply with EPA, Ecology must develop a numeric WLA for stormwater for Pullman and WSU in this TMDL. EPA knows that stormwater data may be limited and allows rough estimates to be calculated. Ecology used the data available to estimate the stormwater water quality characteristics and impacts. The simple qualitative conclusion is that stormwater has an impact on water quality in Pullman. The quantitative estimates may be further refined from additional stormwater monitoring. Bacteria reductions from stormwater are needed.
		Please do not justify the Phase II municipal permit program by its inclusion in this TMDL. The water quality issues in the South Fork are fully addressed by the TMDL process.	Since the TMDL covers areas regulated by the Phase II municipal permit wasteload allocations have to be developed for the covered entities. Inclusion of language regarding the Phase II municipal permit is to explain the program to the reader.

	Page 81, Stormwater and other general permit waste load allocations	Delete the portion on storm events or make a statement here to the effect that “Because of the limited data so far, this portion of the TMDL needs further evaluation throughout the entire watershed before waste load allocations can be done”. Data is insufficient. See #5 above.	To comply with EPA, Ecology must develop a numeric WLA for stormwater for Pullman and WSU in this TMDL. EPA knows that stormwater data may be limited and allows rough estimates to be calculated. Future monitoring can refine the wasteload allocations. A TMDL would not be complete and could not be submitted to EPA without these wasteload allocations.
	Page 84, Conclusions – Whole Watershed, first paragraph	Data does not support “In summary, the dry season load appeared to be generated more locally (primarily from within the city of Pullman), ...”	Ecology assessed the dry season data and concluded that the loading was primarily generated locally compared to the wet season, when the FC loads appeared to be transported through the system. Ecology deleted the parenthesized statement – “...(primarily from within the city of Pullman), ...”
	Page 84, Conclusions – Whole Watershed	Split out the discussion on TSS from Fecal Coliform	Changes in the text were made to differentiate the loads in the second sentence of the second paragraph.
	Page 84, Conclusions – Whole Watershed, second paragraph	Can WSU be split out from the discussion on Pullman? The only infrastructure that is shared is the Jack-in-the-Box outfall.	The loads of Pullman and WSU are combined because they sometimes share the same infrastructure. In the implementation strategy it specifies that the Jack-in-the-Box outfall will be the responsibility of both WSU and Pullman but that the other outfalls are the responsibility of the entity contributing to it.
	Page 84, Conclusions – Upper SFPR	bullet # 2 is not supported by the data, see figure # 9. If 8% of the samples coming from Idaho are above 200 cfu/100 ml is not the water quality standard exceeded?	Ecology finds that Figure 9 does support this conclusion. At an average wet season flow of about 30 cfs at the border the FC load is approximately 3000. Dividing the load by the flow results in a concentration of 100

			cfu/100mL which is the geometric mean standard. The water coming from Idaho just barely meets the concentration standard, thus the load capacity downstream is essentially used up. The second part of Washington’s standard is that not more than 10% can exceed 200 cfu/100 ml.
Page 84, Conclusions – Middle SFPR	bullet # 4 is not clear. Please expand your conclusion that this implies an unknown source in the reach that needs to be identified.		Figure 13 depicts the loading summary. Except for the city of Pullman WWTP, the majority of loading was apparent loads (unmeasured loads calculated by difference of upstream and downstream load) between RM 22.8 - RM 21.5, RM22.9 - RM22.8, and RM24.3 - RM23.6. We measure all known loads entering these reaches and they do not add up to the load leaving the reach, so it appears we have an unidentified load within that reach.
Page 85, Conclusions – Stormwater Analysis for Pullman and WSU	The data is insufficient to be drawing conclusions and more monitoring is needed. This section should be deleted. <u>Addition:</u> The data is based on 1 sample event and is insufficient to be drawing conclusions. DOE should do more monitoring or provide funding to do more monitoring. This section should be deleted or modified. Please provide the reference: “To comply with EPA, Ecology must develop a numeric WLA for stormwater for Pullman and WSU ...”. What about the rest of the watershed.		To comply with EPA and the Clean Water Act, Ecology must develop a numeric WLA for stormwater for Pullman and WSU in this TMDL (reference http://www.epa.gov/npdes/pubs/final-wwtmdl.pdf). EPA knows that stormwater data may be limited and allows rough estimates to be calculated. Ecology used the data available to estimate the stormwater water quality characteristics and impacts. The simple qualitative conclusion is that stormwater has an impact on water quality in Pullman. The extent of that impact in numeric terms may be further refined from additional

			stormwater monitoring, but the bottom line is that implementation of a water quality plan to improve stormwater water quality is needed. The rest of the watershed will be addressed through load allocations. Implementation of best management practices for nonpoint pollution will need to be put into place to address these sources.
	Page 86, Figures 29, Dry season	How can a storm drain (WSU1) have tributaries? Wet season, same question for WSU1 and WSU2	In these cases, WSU#1 and WSU#2 storm outfalls are considered tributaries to the SF Palouse River. They have baseflow year-round so they are treated like tributaries.
	Page 88, Figure 31	Where possible can WSU be split out from Pullman?	See above.
	Page 89 – 90, Implementation/Storm events	Delete this section because of lack of data	See above.

Cheryl Morgan	<p>page #69 last paragraph. "A small lake and wetland on the WSU campus located off Merman Road behind the Chief Joseph Apartments (some believe this may be the historical Lake Depuddle), discharges to two catch basins which eventually discharge to MissSD120."</p>	<p>I request the record be set straight. This so called small lake is not the "historical Lake Depuddle" as per a photo and information as presented by the Whitman County Historical Society in the "Picture of the Past" which was printed in the Moscow-Pullman Daily News. This article clearly states that "Lake DePuddle" was located in a completely different area.</p>	<p>All references to "Lake Depuddle" have been removed. This waterbody is now reference to as a small lake and wetland near Merman Road.</p>
	<p>I don't see in the acronyms what POTW is referring to. (page 28 "SFPR just above Pullman POTW outfall") (page 63 4th paragraph "Albion POTW") (page 27 the map- 34PullPOTW")(pages 48,49,50 PullPOTW)</p>	<p>Should it be WWTP?</p>	<p>POTW is Publicly Owned Treatment Works. It has been added to the list of acronyms.</p>
	<p>On pages: 26,(27 map),28-mouth of Hadley Ck. at Hayward Rd., 48,49,50 all show Hadley Creek.</p>	<p>Should be Hatley Creek.</p>	<p>Corrected.</p>

Michael Yount	page 10, "TMDL process overview"	In this section, please clarify the relationship between the term "TMDL" and the Water Quality Improvement Report (e.g., "The Clean Water Act requires that a TMDL, also called a Water Quality Improvement Report, be developed...")	Language revised.
	page 10, "TMDL process overview", first para	Clarify that the Implementation Strategy and monitoring plan are documented in the Water Quality Improvement Report and not in the succeeding Water Quality Implementation Plan (e.g., add a sentence to the end of the paragraph that says "The Implementation Strategy and monitoring plan are also documented in the TMDL.")	Language clarified.
	page 11, "Elements required in a TMDL"	If I understand correctly, Total Maximum Daily Load has several meanings, depending upon the context: a study and planning process; one or more written reports; or an assigned numeric value. Please clarify how the term is being used and make its use within this section less ambiguous.	Language clarified.

	page 31, third para	Clarify the calculation procedure, e.g., "Loads were calculated by multiplying the FC bacteria concentration by the flow at each site. FC bacteria are measured in colony forming units (cfu) per 100 mL, and flow is measured in cubic feet per second (cfs). The resulting product, reported in loading units, was not converted to the actual load of FC bacteria, measured in cfu per day, because that would result in a large, awkward number that would make comparing loads more difficult. To convert from loading units to cfu per day, multiply the number of loading units by 24,465,067."	Language revised.
Roland Line & Michael Yount	Throughout document	Minor editorial and format comments or comments previously addressed (road or creek name corrections, etc.) above.	Comments have been reviewed and incorporated to the extent possible.