

Appendix G - Response Summary to Public Comments on the Draft Chagrin River TMDL

This document provides a summary of the comments received on the draft Chagrin River TMDL report, made available for public review from February 2 through March 12, 2007. Comments were reviewed and addressed by the Ohio Environmental Protection Agency (Ohio EPA) as described here. For additional information about the comments or the report, please contact: Bill Zawiski, Ohio EPA Northeast District Office, (330) 963-1134, bill.zawiski@epa.state.oh.us

One set of comments was submitted, by the Northeast Ohio Regional Sewer District on March 12, 2007. Note that page number references in comments refer to the draft report and may have changed in the final report. A number of comments were presented as general comments and are responded to as such. Specific comments follow the general ones.

Comment

INADEQUACY OF SAMPLING

The loading curves for the parameters included in draft Chagrin River TMDL report are based on limited sampling, generally, a total of 10 to 12 grab samples at each location. These 10 to 12 samples are intended to represent the entire range of flows. Because of the limited sampling, not all of the flow exceedence ranges were sampled. This is especially problematic because there was only one instance in which data were collected at the highest flow exceedence range, when the loading should be the greatest. The inadequacy of this sampling becomes evident when looking at the observed loads. For example, in the Fecal Coliform Loading Statistics for Load Duration Site D01P19, the load under dry conditions, the 80-90 flow exceedence range, is 5.5 times greater than the load for the next higher flow range. This is unexpected since an increase in flow should result in at least an equal, if not higher, load based on the assumptions used to generate the load duration curve.

Since there are five separate flow zones, even a sample set of ten could at best cover each flow exceedence range only twice. We submit that even ten samples is not a sufficient minimum number (as suggested on page 23) to conduct these analyses. Many of the load duration analyses were conducted with less than ten samples. Given the possibility of outliers, and the inherent imprecision in grab sampling, the data sets are simply far too limited at all of the sites presented, with the exception of Daniels Park (502400).

Response

The TMDL is a process by which a generalized restoration plan is set forth for impaired rivers and streams. While additional sampling would be welcomed, realistic budget and resource constraints need to be considered when assessing a watershed. Ohio EPA has a long history of competent assessments and is considered a national leader in this area. Ohio EPA considers the level of sampling adequate to generate this TMDL report.

Comment

LOAD DURATION

Particularly troubling is the lack of correlation between load duration sites (where sampling was conducted and for which loadings were established) and biocriteria sampling sites. While the information may be pieced together, we suggest that it would be much more beneficial to provide a map clearly showing the location of all of these sites in relation to each other. Such a map should make the connection between non-attainment at the biocriteria sites and load reductions less tenuous.

We suggest that it would be very helpful to have a map showing the relationship between biocriteria sites (where impairment has been found) and load duration sampling sites (where suggested load reductions have been calculated).

Additionally, we suggest that Appendix E, should include figures that display both the line of best fit and the Load Exceedence Analysis on the same graph.

Response

A map of load duration sites was included as Figure 4-1 in the draft report.

The table below lists a load duration location and river mile along with the corresponding biological site and river mile. As is shown, each load duration site had a corresponding biological sampling site. A total of 66 sites were assessed for biological attainment during the 2003-2004 survey. A total of 57 sites were assessed for chemical attainment during the 2003-2004 survey.

| Site Name | Load Duration Site | River Mile | Biological Site | River Mile |
|-------------------------------------------------|--------------------|------------|-----------------|------------|
| Aurora Branch @ Bainbridge Road | Yes | 3.8 | Yes | 3.7 |
| Aurora Branch @ Solon Road | Yes | 1.03 | Yes | 1.0 |
| Spring Brook @ Old RR grade | Yes | 0.1 | Yes | 0.28 |
| Chagrin River @ Sperry Road | Yes | 40.05 | Yes | 40.0 |
| Chagrin River @ Miles Road | Yes | 28.96 | Yes | 28.9 |
| Chagrin River @ Chagrin Blvd. | Yes | 25.3 | Yes | 25.3 |
| Chagrin River @ Old Mill Road | Yes | 18.08 | Yes | 18.08 |
| East Branch Chagrin River @ Mitchells Mill Road | Yes | 10.28 | Yes | 10.3 |
| East Branch Chagrin River @ Markell Road | Yes | 2.35 | Yes | 2.4 |
| Chagrin River @ Daniels Park | Yes | 4.95 | Yes | 4.8 |

Comment

NUTRIENT ENRICHMENT

The TMDL identifies phosphorus as a cause of non-attainment in the Chagrin River, however the report does not provide an analysis of phosphorus data to indicate that phosphorus actually is the cause. An OEPA report titled Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams (1999) purports to demonstrate a relationship which results in defining a target for phosphorus at 0.17 mg/L. However, even though the phosphorus concentrations in the Chagrin River do not always

meet this target, the draft Chagrin River TMDL report does not have a site-specific analysis demonstrating that biocriteria non-attainment is dependant upon the phosphorus concentrations. The TMDL process must be a transparent one, with clear cause and effect relationships supported by robust data. There is no evidence in this draft TMDL report that phosphorus concentrations in the Chagrin River are leading to impairment of biological criteria.

The same situation exists for nitrite-nitrate. Once again, an association has taken the place of a demonstration of cause and effect, or even direct evidence supporting the contention that nutrient concentrations are to blame for non-attainment. As with phosphorus, there is no analysis demonstrating a relationship between the biocriteria metrics and nitrogen compounds which would support a causal relationship.

Response

The TMDL indicates that phosphorus and nitrate deviate from targets. These chemical deviations have been demonstrated to be statistically related to biological attainment by Ohio EPA. Ohio EPA believes that phosphorus and nitrate do have impacts on aquatic life as does the U.S. EPA considering their efforts towards developing nutrient criteria.

It appears that the comment is considering that biological attainment is directly related to chemical water quality. This appears to contradict with a later comment identifying a need for equal weight for both chemistry and biology.

Comment

HABITAT

The Ohio EPA apparently perceives habitat degradation as a cause of impairment on the Chagrin River. However Figure 3-1 indicates that only four sites out of 56 failed to meet the QHEI target of 60. In fact, many of the QHEI scores listed in Appendix A are at a level described as “excellent” in “The Use of Qualitative Habitat Evaluation Index for Used Attainability Studies in Streams and Rivers in Ohio” (Rankin, 1989).

Table 3-3 provides targets for specific high-influence and moderate-influence QHEI metrics and Table 4-71 provides step-by-step directions for reaching the habitat TMDL. However, the report does not present an analysis of the QHEI based metrics, nor are the directions applied to the QHEI scores.

The rationale for the Total Suspended Solids TMDL is based on the QHEI scores. Unfortunately, the only information provided is the fact that nearly all sites meet the QHEI target. Neither the underlying data nor the specific steps taken to reach the conclusion are presented.

The TMDL report, on page 100, touts the ability of the QHEI to “assess both the source of sediment ... and the effects on the stream itself”. However, the report presents neither evidence showing the source of sediment or the effects on the stream in the case of the Chagrin River. Page 100 also states that “Siltation has not historically been listed as a high magnitude cause of impairment in Chagrin River. As development in the upper watershed increases it is anticipated that siltation will increase in the smaller low gradient

streams". While this may be the case, it is not appropriate to develop a TMDL to reduce current loadings in anticipation of possible future degradation of water quality. The appropriate action would be to institute and enforce regulations governing stormwater, erosion control and other future sediment sources to prevent the degradation from happening at all.

The discussion of point sources should be accompanied by a calculation of their actual input to the stream and a comparison of how this will impact the achievement of the purported goals. However, we would like to re-emphasize that the report does not make a solid link between sedimentation and impairment.

Response

Ohio EPA and others have used the QHEI as one tool in assessing and understanding stream habitat and its relation to stream ecology. The TMDL identified targets for total suspended solids, QHEI, QHEI-Habitat, and QHEI-Sediment. These targets are set as goals for both restoration and protection.

While much of the Chagrin watershed is in attainment, there are areas that are in nonattainment. Ohio EPA believes that land-use patterns do influence stream ecosystems and that the combination of biological, chemical, bacteriological, and habitat assessments can identify when impacts are occurring or have occurred. Prevention of habitat and stream riparian zone degradation is much more cost effective than restoration efforts, is consistent with the goals of Ohio EPA's storm water program, and also aligns with goals of the Chagrin River Watershed Partners.

Comment

ORGANIC ENRICHMENT

The draft report fails to recognize that the criterion of 1,000 cfu/100mL is to be applied to a geometric mean of all fecal coliform values in the representative monthly data set collectively, regardless of river flow. It incorrectly applies state water quality criteria which, if applied correctly, provide that up to ten percent of the fecal coliform values in the representative monthly data set may exceed 2,000 cfu/100mL. This misinterpretation and misapplication of the criteria result in a significant overestimation of the fecal coliform load reductions required. A more appropriate approach would be to use a representative distribution of river flow-associated fecal coliform loads. The geometric mean of these representatively distributed, flow associated densities can be compared to the state's geometric mean criterion of 1,000 cfu/100mL. The 90th percentile fecal coliform densities can then be determined from the data. The differences between 2,000 cfu/100 mL and the densities lower than the 90th percentile can be used to calculate the fecal coliform load reduction percentages required at the respective densities. A 10% Margin of Safety and 10% reserved for Future Growth can be incorporated by subtracting 20% from the water quality criterion, resulting in a value of 1,600 cfu/100 mL. Fecal coliform load reduction percentages required to meet this value can then be calculated.

Table 3-6 does not accurately depict the State of Ohio Water Quality Standard for recreational use designations. The "instantaneous" criteria in this table are not

“maximums,” never to be exceeded, but standards not to be exceeded in more than ten percent of the samples taken during a thirty-day period.

It is also not correct to use pooled data from a five year period (1999 through 2004) to determine compliance with the Primary Contact Recreation criterion (see page 6). Primary Contact Recreation criteria, both geometric mean and the amount not to be exceeded in more than ten per cent of the samples, apply to samples taken during any thirty-day period. No standard currently exists for pooled data. Thus, pooled data certainly cannot be used to determine partial attainment of the recreational use criteria as is done on page 7.

Response

Ohio EPA has used the bacteria water quality standards as a target and identified deviations from the target as such. Load curves are based on the target, and not identified as violations of water quality standards.

The need for appropriate numbers of samples in a 30-day time frame to determine a water quality standards violation does not apply to the targets.

Comment

USE OF SIGNIFICANT DIGITS

In the Loading Statistics for Load Duration tables, the use of significant digits is not consistent. In some instances, the allowable load is carried out to two decimal places, while in others, it is not. In addition, only whole numbers are given for the observed load and appear to be truncated instead of rounded. Because of this, it appears that reductions are called for when there is no observed load. This should be clarified.

Response

Ohio EPA thanks the reviewer for their comment. Allowable loads in a few tables have been edited to address the commenter’s concern about significant digits. We reviewed all of the tables in question and found no instances where a reduction is called for when there is no observed load.

Comment

PERCENT REDUCTIONS

In the discussions of the percent reductions needed under certain flow conditions, statements are sometimes given for the entire range that are not accurate. For example, in the Chagrin River (D01G01) section for TSS (Table 4-18), it is stated that TSS loads need to be reduced by 36 to 70 percent during moist conditions. This is misleading. Under moist conditions at this site, the table shows that reductions need to be made by 0.0%, 70.9%, and 35.9%. It is unclear whether the recommended reduction should be the greatest reduction in the flow category, or should be an average of all of the suggested reductions. This should be clarified throughout the draft TMDL report to reflect the actual reductions needed.

“Observed load” in tables with more than one sample at a Flow Exceedence Range is not clearly defined. Is the observed load the mean of the samples, the median of the samples, the highest sample? This should be clarified.

Response

Ohio EPA thanks the reviewer for their comment. A long discussion of data derivation precedes the tables in question. It is not practical to repeat all of the explanations in each table. After reviewing all of the referenced instances and the discussion already included in the report, we believe that the report is adequate as currently written.

Comment

Page viii: “TMDLs were prepared for phosphorus, nitrates, habitat, bacteria, and siltation”. TMDLs in this draft report were prepared for phosphorus, nitrates, habitat, bacteria, and total suspended solids. Total suspended solids are not the same as siltation. If siltation is the impairment, then it should be addressed specifically.

Response

Ohio EPA thanks the reviewer for their comment. The report has been revised to remove “siltation” and add “total suspended solids”.

Comment

Page 3: “Attainment of WQS is measured utilizing both biological communities and chemical sample analysis”. Very little weight is given either in this paragraph or in the entire draft report to chemical sample analysis. Biocriteria should be considered in tandem with chemical water quality to develop an entire picture of water quality conditions in the watershed. Giving excessive weight to biocriteria promotes an unbalanced approach.

Response

Ohio EPA is a national leader in the use of biological assessments for determining water quality. Biological communities have been shown to be generally more sensitive to actual environmental water quality due to their long-term exposures. Chemical standards are equally weighted during the review process. Due to their sensitivity, biological criteria tend to be the driving factor in water quality attainment. If there were chemical criteria exceedences they would have been included in this TMDL. As mentioned in other responses, the commenter may want to refer to the biological report prepared for this watershed, available on the internet at:

http://www.epa.state.oh.us/dsw/documents/ChagrinRiverTSD_2003to2004.pdf

Comment

Page 6: “Dewdale Creek (at river mile 2.6) and Marsh Hawk Run are in NON attainment of biological community goals”. As presented in the next two sentences, neither Dewdale Creek nor Marsh Hawk Run are currently designated and thus presently have no attainment status. We suggest changing the wording of this sentence to “Dewdale Creek (at river mile 2.6) and Marsh Hawk Run would be in NON attainment of proposed biological community goals”.

Response

Ohio EPA thanks the reviewer for their comment. The word “recommended” has been added before “biological community goals” in the place specified in the report.

Comment

Page 7: “...it is very likely that the value reported is representative of conditions at this location” used in reference to a single sample with an elevated level of bacteria; and Page 8: “...only six samples were collected from this area during the survey, and the results may not be indicative of all flow conditions occurring during a typical recreation season”. How can a single sample be very likely to be representative, while six samples may not be indicative of all flow conditions? We suggest that neither the single sample nor the set of six samples represents a large enough set to be indicative of all flow conditions. Furthermore, where is this data? It is referenced as proof of poor water quality conditions in the Chagrin River, but the actual data are not presented in this draft TMDL.

Response

Ohio EPA thanks the reviewer for their comment. Ohio EPA can use data and best professional judgment based on knowledge of the watershed and its history in making adequacy of data determinations. Ohio EPA feels that the report reflects our current understanding of the information and is appropriate as written. The data for this and all other parameters can be found in the Chagrin River Technical Support Document, which may be located on the internet at:

http://www.epa.state.oh.us/dsw/documents/ChagrinRiverTSD_2003to2004.pdf

Comment

Page 8: “Although the geometric mean for fecal coliform was met in Stoney Brook ... it is likely that bacteria loads to the East Branch from Stoney Brook are a primary cause of the elevated fecal coliform counts observed at the downstream sentinel sampling site located on the East Branch at Markell Rd.” If the geometric mean was met in Stoney Brook, why would bacteria loads further downstream be attributed to this creek? Presumably, Stoney Brook does not have high loads to begin with (as evidenced by meeting the geometric mean) and any bacteria loads it does have would further be diluted by the East Branch. Are there significant bacteria inputs downstream of the sampling site(s) on Stoney Brook that were not captured by the sampling strategy?

Response

The comment did not include the entire wording from the TMDL section quoted. In its entirety it reads:

“Although the geometric mean for fecal coliform bacteria was met in Stoney Brook, historical problems relating to unsewered areas and the numerous small wastewater treatment plants discharging to Stoney Brook in the Kirtland area are well known. It is likely that bacteria loads to the East Branch from Stoney Brook

are a primary source of the elevated fecal coliform counts observed at the downstream sentinel sampling site located on the East Branch at Markell Rd.”

The bolded text, which was omitted in the comment letter, conveys additional information and justification for our concerns.

Comment

Page 9: “It is likely that larger data sets at all of the sampling locations, including more data collection during high flow situations, would indicate a greater degree of nonattainment of the recreational use criteria throughout the watershed.” The data sets are so limited, that it is misleading to make such a statement. It is entirely possible that larger data sets may indicate a lesser degree of nonattainment of the recreational use criteria throughout the watershed. We reference the robust data set acquired at the site at Daniels Park (502400), Table 4-57, which shows that fecal coliform loads need to be reduced at only the three highest flow regimes. Similar data at other sites could produce the same results.

Response

Ohio EPA thanks the reviewer for their comment. Our experience in watershed assessment and knowledge of the watershed allow for professional judgments to be made. The commenter appears to apply similar judgment in earlier comments about “inadequacy of data.” Ohio EPA feels that the report text is adequate as currently written.

Comment

Page 15: Table 3-3: QHEI attributes are not criteria; it is misleading to label them as such. We suggest that they be labeled as “targets” or “goals”.

Response

Ohio EPA thanks the reviewer for their comment. The word “Target” has been added above “criteria.”

Comment

Page 15: “These measurements provide a target for sedimentation”. QHEI metrics are subjective assessments of stream habitat attributes, which are assigned a score by an evaluator. They are not measurements. We suggest the wording “These estimations (alternatively, assessments) provide a target for sedimentation”.

Response

Ohio EPA thanks the reviewer for their comment. The wording “QHEI scores” has been added in place of “measurements”.

Comment

Page 15: “The lowest 25th percentile of the data is interpreted as the least contaminated 25 percent of all the observed values, which EPA has suggested can be comparable to “reference conditions” (U.S. EPA, 2000)”. This full U.S. EPA reference is not included in the reference section, nor is it included in the text. We would like to view the reference

which states that the lowest 25th percentile of data can be comparable to “reference conditions” to see the evidence used to support this methodology.

Response

Ohio EPA thanks the reviewer for their comment. The reference was omitted in the report and has been added. The data for this and all other parameters can be found in the Chagrin River TSD which may be located on the internet at:

http://www.epa.state.oh.us/dsw/documents/ChagrinRiverTSD_2003to2004.pdf

Comment

Page 21: “Phosphorus, nitrates, total suspended solids, and fecal coliform bacteria have been identified as causes of impairment in this watershed”. The causes of impairment to this watershed have been identified as organic enrichment, nutrient enrichment, flow alteration, and habitat degradation (see Page 1 of the draft TMDL report).

The organic enrichment, nutrient enrichment, and habitat degradation have been associated with impairment. No clear cause and effect between these conditions and nonattainment of biocriteria goals has been established.

Response

Ohio EPA thanks the reviewer for their comment. Ohio EPA believes that it has already established these links and that the report is adequate as written.

Comment

Page 32: “The greatest exceedence of the standard is during dry flow conditions”. This sentence is referring to nitrite-nitrate loading. There is no water quality standard for nitrite-nitrate. We suggest the wording “target” or “goal”.

Response

Ohio EPA thanks the reviewer for their comment. The word “target” has been added in place of “standard.”

Comment

Page 33: “...sources include runoff from pasture lands, runoff from residential lands, and failing septic systems”. None of the fecal coliform observations at this site exceeded the loading limit. If failing septic systems were a likely source of nitrite-nitrate at this site, shouldn’t there be a high level of fecal coliform as well?

Response

The comment failed to include the entire wording from the TMDL section quoted. In its entirety it reads:

“**Potential** sources include runoff from pasture lands, runoff from residential lands, and failing septic systems”.

Septic systems can be a source of both nutrients and fecal coliform bacteria. The determination of potential sources is adequate as written in the report.

Comment

Page 99: Table 4-71: the draft report emphasizes use of the substrate category of the QHEI as a measure of siltation. Why isn't Substrate Quality/Silt Heavy listed as a high influence attribute?

Response

Ohio EPA thanks the reviewer for their comment. **Silt/Muck Substrate** is currently included as a high influence attribute.

Comment

Page 100: "...the QHEI can be an indicator for pollutants such as sediment". Sediment is not a pollutant. We suggest the wording "...stressors such as sediment".

Response

Sediment as measured by total suspended solids is a pollutant.

Comment

Page 108: "Identification of illicit discharges to storm sewer systems will also improve water quality". Identification will not produce water quality improvements. We suggest the wording "mitigation (or alternatively elimination) of illicit discharges to storm sewer systems will also improve water quality".

Response

Ohio EPA thanks the reviewer for their comment. The words "and elimination" have been added following "Identification."

Comment

Page 128: "Local involvement in monitoring is encouraged". While it is stated that water quality data will be collected in accordance with credible data rules, no limitation is made for the use of data collected. Since the TMDL falls under the umbrella of "regulatory and management decisions involving surface water resources in Ohio" (3745-4-01, Paragraph C, section 3), it is not appropriate for any data less than level 3 to be used in the TMDL process. This should be clarified in this section of the draft TMDL report.

Response

Ohio EPA thanks the reviewer for their comment. We are aware that Level 3 data collection methods are needed to make determinations for purposes of "regulatory actions." However, we are also aware that to truly gain an understanding and appreciation of the aquatic ecosystem, local citizens and decision makers need to be engaged in the educational process (Level 1).

Other less rigorous methods of data collection and analysis can be used to help focus further efforts of study or to evaluate the effectiveness of implementation actions recommended in a TMDL. For example, OAC 3745-4-01 (C) ((2) states:

Level 2 data are collected and submitted to Ohio EPA for the purposes of evaluating the effectiveness of pollution controls for point sources and nonpoint sources and initial screening of water quality problems to determine if additional study is needed. It may also serve the purpose of public awareness and educational activities.

Thus, data at all levels can have a place in various aspects of the TMDL effort. We believe the report text is adequate as written, without the complicated explanation of data rigor.

Comment

Appendix A: Some of the river miles have a superscript of "R". This designation is not listed in the legend and is never defined.

Response

"R" refers to Regional Reference site. This has been added to the appendix.