Appendix O: Responsiveness Summary to Public Comments

Authors of Written Comments on the Draft Lower Cuyahoga River TMDL Report

#	Date Received	Name	Organization
	7-29-03	**Public notice given for the draft Lower Cuyahoga River TMDL report**	
1	7-17-03	Ron Janke	Citizen
2	7-30-03	Erwin Odeal	Northeast Ohio Regional Sewer District
3	8-5-03	Meg Plona	Cuyahoga Valley National Park
4	8-6-03	Harold Huff	Portage County Water Resources
5	8-17-03	Mike Carpenter	Citizen
6	8-17-03	Bernard Pressman	Citizen
7	8-18-03	David Hill	Citizen
8	8-19-03	George Pricher	Citizen
9	8-25-03	Tom Jenkins	Citizen
10	8-26-03	Pat McCarthy	Pond Brook Watershed Initiative
11	8-27-03	Keith Dimoff Dan Nelson Chris Vild Elaine Marsh	Ohio Environmental Council Ohio Sierra Club - Portage Trail Group Tinkers Creek Land Conservancy Friends of the Crooked River
12	8-28-03	John Debo	Cuyahoga Valley National Park
13	8-28-03	Ron Feltenberger	Universal Electric Power
14	8-28-03	Marie Sullivan	Cuyahoga River RAP
15	8-28-03	Edith Chase	Citizen
16	8-28-03	Jeff Fusco	City of Akron
17	8-28-03	Erwin Odeal	Northeast Ohio Regional Sewer District
18	8-28-03	Frank Lucco	Citizen
19	8-28-03	Andy Vidra	Northeast Ohio Areawide Coordinating Agency

All comments received during the public notice time frame are noted above. Comments were reviewed by the Ohio Environmental Protection Agency (Ohio EPA) and addressed in the following manner.

Numerous comments identified editing-related issues, including identification of spelling and grammar errors, reference errors, and citation errors. These errors were addressed

as appropriate In addition, some comments requested additional text clarifying a subject or item, word crafting, or other related issues. These edits did not result in changing the overall content or intent of the report. Ohio EPA thanks the commenters for contributing to the overall clarity and accuracy of the report.

Substantive comments and those posing a question are specifically responded to below. Similar comments were grouped and referenced by comment author, keyed to the numbered list above. Page number references in the comments refer to the draft report available for public comment and may not apply to the final report.

1. Comment:

A request was made that the Ohio EPA withdraw the public notice for the TMDL due to discussions of the project time line presented at a June 19, 2003 stakeholders meeting. Specific reference was made to a preliminary draft report distributed at that meeting asking for comments by July 31, 2003. Stakeholders were told that Ohio EPA anticipated that a draft report would be public noticed on or about September 1, 2003. An additional comment was made requesting the extension of the comment period. [2, 16, 17, 19]

Response:

The Ohio EPA believes that sufficient time was made available for public review and does not agree that the public notice should be withdrawn or the comment period extended. The preliminary draft distributed on June 19, 2003 is substantially identical to the July 29, 2003 public noticed draft. Taking the time period from June 19 to August 28, a total of 70 days was available to review the draft.

In addition, several stakeholders (including the comment authors) were involved in discussion of the modeling tools, model inputs, etc., for many months. Open discussion of the condition of the Cuyahoga watershed and the causes and sources of impairment have been occurring in and around public meetings held by Ohio EPA in the watershed for more than a year.

2. Comment:

A comment was made that more detailed information be presented concerning the basis for utilizing phosphorus as a nutrient of concern in the TMDL process. [2, 14, 16, 17]

Response:

The Ohio EPA added Appendix L to the final TMDL report. Appendix L discusses nutrients in general and specific observations of nutrient impacts in the Cuyahoga.

3. Comment:

A comment was made that based on a National Research Council Report (*Assessing The TMDL Approach To Water Quality Management*, National

Research Council, 2001), that a use attainability analysis be conducted prior to development of a TMDL. Completion of a TSD was commented on as being necessary prior to beginning the TMDL. [2, 16, 17]

Response:
The Ohio EPA conducts watershed-based stream assessments on a rotating basis. During each assessment, multiple indicators, including bacteriological, biological, chemical, and physical, are evaluated. This approach is consistent with assessment program recommendations in Chapter 3 of the NRC report. The assessment of the lower Cuyahoga River was conducted prior to TMDL development to provide current data for use in both waterbody assessment and TMDL development.

Ohio EPA's monitoring program provides adequate information to determine attainment of water quality standards, including use designation. The evaluation of the appropriateness of current use designations for a waterbody is frequently presented in a TSD (Technical Support Document), and an update of the most recent Cuyahoga TSD will be forthcoming. However, the Lower Cuyahoga River TMDL utilized current monitoring results, for which use designation appropriateness was evaluated. It should be noted that TSDs are not produced for all TMDLs.

One commentor had been provided all of the data collected during the 2000 survey.

4. Comment:
As clearly demonstrated by Ohio EPA studies, the role of habitat is a critical feature to consider in the development of TMDL implementation plans. This is due to the role that habitat plays in processing loads of nutrients and buffering biology against a variety of stream stresses. Accordingly, it is reasonable to discuss goals for habitat throughout the watershed. It is also appropriate to note the potential connection between habitat impairment and sediment loads. However, Chapter 3, in discussing habitat, seems to overstate the connections between the problem of sedimentation, habitat impairment, and usefulness of the QHEI as a surrogate measure for sedimentation problems, which can be controlled in a water quality regulatory setting. The report should be clear that factors affecting QHEI scores might be related to land use decisions that are not regulated by Ohio water quality standards. [2, 16, 19]

Response:
The QHEI is a tool that was developed to assess habitat for stream fishes; its usefulness for any other purposes is diminished, but not irrelevant. In a smaller stream or one that is severely impacted by erosion and sedimentation, the final QHEI score itself can be a surrogate measure for sedimentation problems. It is agreed that in other situations, the total QHEI score may not be as relevant to assess sedimentation issues as the scores for individual QHEI metrics, such as

those for substrate quality or riparian land use. Poor habitat, as measured by the QHEI, is also a direct impediment to attainment of biocriteria in Ohio water quality standards and reduces the assimilative capacity of the stream. Therefore, habitat is an essential element to ensure attainment in Ohio's surface waters. The rationale for using the QHEI is more fully explained in Section 4.

Many factors, including land use, have an impact on the State's water resources and are not regulated by Ohio EPA nor by the NPDES permitting system. Recommendations contained within TMDLs are often beyond the authority of Ohio EPA or other regulatory bodies. For this reason, local stakeholders and decision-makers are encouraged to participate in TMDL development, then continue to discuss options relative to local values and to make informed decisions to implement solutions that restore their water bodies. Indeed, this local commitment and action is vital to attaining the goals of the Clean Water Act.

5. Comment:
In 6.1.1.1 the report hints at, but does not clearly state, that there is a planned process for further development of an implementation plan. Is this the case? [2]

Response:
Section 6.1.1.1 presents a summary of reasonable assurances. Sections that follow describe the reasonable assurances in greater detail including a projected time line. Section 6.2 discusses the next sampling effort in the basin and indicates that additional changes may be made in the TMDL or a new one developed at that time.

6. Comment:
Several comments were presented concerning the need for phosphorus load reductions and asking for more detailed explanations of phosphorus and other nutrients. [2, 16, 17]

Response:
A more detailed discussion was developed; see Appendix L in the final report.

7. Comment:
Kingsbury Run: PAH concentrations have been identified in the sediments. Have they been identified in the fish tissue? Does NAWQA have anything for fish tissue in that area? That would be interesting information. [3]

Response:
The National Ambient Fish Tissue collections for the Cuyahoga River were made north of Center Street near the mouth of the Cuyahoga River approximately 3 miles downstream of Kingsbury Run. The linkages between the fish tissue contamination near Center Street and the sediment contamination at Kingsbury Run are tenuous.

8. Comment:
Comments were received concerning farming within the Cuyahoga Valley National Park and its impact on the watershed. [18]

Response:
The importance of riparian protection, including protection within farmed areas, to improving water quality has been discussed in the report and riparian protection measures are part of the reasonable assurances.

The Cuyahoga Valley National Park (CVNP) has been working on a Rural Landscape Management Program which includes both historical and ecological protection and restoration. A Draft Environmental Impact Statement for the plan can be found on their web site at: http://www.nps.gov/cuva/management/rmprojects/ruraleis/index.htm.

The Cuyahoga Valley Nation Park also has a Riverbank Stabilization Plan and a Wetland Restoration Plan designed to address habitat issues. The CVNP is currently implementing riparian and wetland buffer requirements with setbacks designed to protect streambanks.

9. Comment
Additional discussion on the Canal Diversion Dam was requested in relation to maintaining a water source for the Ohio and Erie Canal. [12]

Response
The Ohio EPA has included additional information.

10. Comment:
The Cuyahoga Valley National Park commented on several programs they are undertaking which will improve water quality. [3, 12]

Response
Additional text has been included in the report in relation to these programs.

11. Comment:
A number of comments were received in support of removing the Canal Diversion Dam and other dams in the Lower Cuyahoga River TMDL area. [6, 7, 8, 12] Comments were received concerning potential sediment management issues associated with removing dams. [16] One commenter questioned if dam modification is the best way to move forward. [5]

Response:
The Ohio EPA agrees that dams can be a source of water quality impairments, and there is general agreement that dams can pose recreational hazards.

Removal of a dam is a complex and sometimes controversial undertaking. The recommendation to address the Canal Diversion Dam is a first step. It should be noted that the Ohio and Erie Canal is a historic structure. Removal or modification decisions for the dam must consider provision of a suitable source of water to the canal, which the impoundment currently provides.

Section 6.1.1.2. discusses the removal of other dams in the watershed besides the Canal Diversion Dam. The TMDL suggests that the feasibility of removing a dam be evaluated along with its ecological benefits. Sediment management may prove to be an obstacle at the Ohio Edison dam; until a feasibility analysis is completed this remains an open question. The same analysis would also be conducted for the dams located on the mainstem in Cuyahoga Falls.

12. Comment:
A comment was made that specific QHEI targets should be established for each category. [11]

Response:
The QHEI target value has been described in the report and set at 60 for all warm water habitat streams.

13. Comment:
A comment was made to impose additional restrictions regarding household sewage treatment systems, sewer tie-ins, and industrial permits should the river not meet attainment goals within five years, and that this should be noted in the report. [11]

Response:
If at the end of 5 years this section of the watershed is not in compliance the TMDL process would need to begin anew to address remaining segments in non attainment. The above conditions would be considered at that time.

14. Comment:
A comment was made that no 401/404 or Nationwide 404 permits be issued until stream segments attain appropriate water quality standards where habitat alteration is a major cause of non-attainment. [11, 16]

Response:
The report recommends that wetland habitats be protected in the watershed based on their quality. High quality wetlands should not be degraded, and Category 1 wetlands should have mitigation conducted within the basin. The report also recognizes the importance of stream habitat and recommends the development of riparian protection ordinances. The report makes recommendations, not rule changes. Existing rules allow the director to base decisions for impacts to high quality wetlands on public need. Applications will be evaluated individually for water quality impacts.

15. Comment:

If at the five-year sampling, segments in non-attainment for non-point sources and/or habitat alteration have not come into attainment, the Ohio EPA should condition all local jurisdiction's Stormwater Phase II permits with requirements above the minimum Clean Water Act requirements such that runoff will be reduced by half within three years. [11, 19]

Response:

The initial Phase II stormwater program will be implemented and its effectiveness evaluated during the next Cuyahoga River comprehensive sampling effort. Should impairments still exist that are identified with stormwater related issues, the existing MS4 general permit contains the following language relating to the TMDL program (available at http://www.epa.state.oh.us/dsw/permits/GP_OHQ00001.pdf):

1.3.6 Discharges of any pollutant into any water for which a Total Maximum Daily Load (TMDL) has been approved by U.S. EPA (this information can be obtained from Ohio EPA) unless your discharge is consistent with that TMDL. This eligibility condition applies at the time you submit an NOI for coverage. If conditions change after you have permit coverage, you may remain covered by the permit provided you comply with the applicable requirements of the TMDL. For discharges that cannot comply with TMDL requirements under this permit, you will be instructed by Ohio EPA to apply for an individual or other applicable general NPDES permit.

Thus, individual permits could be required (Akron already has an individual permit). Another option is the development of a watershed-specific general permit under the “alternative general permit” language in the MS4 rules. Additional control measures would be implemented if needed during the next TMDL effort.

16. Comment:

A comment was made concerning dredging in the Lower Cuyahoga River (Ship Channel) and the need to conduct it in an environmentally sensitive way. [11]

Response:

The Ohio EPA agrees that dredging should be conducted in a manner to minimize impacts. A Memorandum of Agreement exists between Ohio EPA and US Army Corps of Engineers (ACOE) to participate in evaluating dissolved oxygen and habitat problems and to restore and enhance water quality, including aquatic habitat. A sediment transport model is being developed to address some of the issues and is discussed in Section 6.2.

The individual 401 permit issued by the Director of Ohio EPA for the dredging project has several conditions requiring aquatic habitat improvement, RAP involvement, and feasibility studies for establishing fish habitat areas.

17. Comment:
Two comments were made concerning CSO controls and new sewer connections. [11]

Response:
The two CSO areas in the Lower Cuyahoga River TMDL area are required to have Long-Term Control Plans approved to address CSO control and/or elimination. Until a plan is approved, each project submitted within a CSO area must include a load reduction "trade off", in relation to the specific project. New sewer connections are not approved without a trade off. An approved Long Term Control Plan will contain a schedule for implementing CSO control and or elimination actions. Communities which have been actively addressing CSO issues prior to a Long Term Control Plan being approved may be allowed to continue without individual flow trade off projects.

18. Comment:
A comment was received concerning the need to preserve wetland habitat in the Pond Brook watershed in addition to addressing discharges of pollutants. [10]

Response:
The report concurs with the need to protect habitat in the watershed. Riparian protection and wetland protection are mentioned in the reasonable assurances. Pond Brook is also within the Tinkers Creek watershed. The Stressor Identification Project may identify the need for additional load reductions following the analysis.

19. Comment:
Comments were presented on the time-frame for developing the TMDL referring to it being on a "fast track". [16]

Response:
The Ohio EPA does not agree that the TMDL was placed on a "fast track" for development and implementation. The Lower Cuyahoga TMDL time period for development has been approximately 16 months from the initial stakeholders meeting on March 14, 2002 until the public notice of the draft report. Other TMDLs prepared by the Ohio EPA have ranged from 14 months to 20 months (an average of 17.2 months for 7 TMDLs evaluated), the Lower Cuyahoga River TMDL falls within this range.

In addition to the TMDL process, the Cuyahoga River (from the Ohio Edison dam to Lake Erie) is also a designated Area of Concern by the International Joint Commission. The Cuyahoga RAP has been active since 1988 working towards elimination of beneficial use impairments, identified in a 1992 Stage 1 report which includes degraded fish and benthos populations. This TMDL functions as a focal point for work currently being done or required to be done by various existing rules and regulations.

20. Comment:
Several comments were received concerning the City of Akron CSO system and interpretation of its impacts to the Lower Cuyahoga River watershed. [16]

Response:
The Ohio EPA has evaluated several reports prepared by the City of Akron concerning its CSO system. The Ohio EPA has also conducted several comprehensive surveys of the watershed as described in section 2.2 of this report. Ohio EPA has concluded that the CSO system does have negative impacts on the watershed. The Ohio EPA believes that addressing CSOs in the Lower Cuyahoga River TMDL area will result in water quality improvement.

21. Comment:
A comment was made that the main cause of impairment to the Little Cuyahoga is habitat modification. [16]

Response:
The Ohio EPA acknowledges that habitat is an issue in the Little Cuyahoga River, but the TMDL mentions multiple causes of impairment. Ohio EPA is currently unaware of any existing or proposed riparian or habitat ordinances within this subwatershed. As mentioned in comment #20, CSOs are believed by Ohio EPA to have a negative impact on the Little Cuyahoga River.

22. Comment:
A comment was made concerning the inclusion of two streams on the 303(d) list in the absence on current monitoring information. [16]

Response:
Once a stream is included on the 303(d) list it remains there, until new data indicates that the stream is attaining water quality standards.

23. Comment:
We appreciate the logic and value added by the "load duration curve" methodology as applied to the Cuyahoga data set. At the same time, we continue to call for completion of the "Soil and Water Assessment Tool (SWAT), which was partially developed to support the Lower Cuyahoga TMDL. We believe that the SWAT tool, with its ability to provide an integrated analysis of loading sources and in-stream water quality effects, is an important tool in the long term TMDL process. We believe that completion of the SWAT model will help to more precisely identify control objectives within specific portions of the Cuyahoga watershed and will also provide an important tool for analysis of alternative control options. [2, 16, 17]

Response:
The entire process used to develop this TMDL is sufficient to identify control objectives within specific portions of the Cuyahoga watershed. The SWAT tool

may be able to provide additional guidance should interested parties wish to develop it further. As restoration proceeds in the watershed, the time may come when a more delineated analysis is needed; future iterations may develop the SWAT model or other higher resolution analysis tool. In the mean time, Ohio EPA can make available all the data sets and SWAT model input developed in the early stages of this project.

24. Comment:

Chapter 4 contains language briefly discussing conditions where habitat has been degraded. In particular, mention is made of complex interactions between remaining biota, and the pollutants, heat, sediment, nitrate and phosphorus. Additional discussion and/ or references should be provided to support this point. [2, 16, 17]

Response:

The report *Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams* (Ohio EPA Technical Bulletin MAS/1999-1-1) discusses these interactions more fully and is cited as appropriate in the TMDL report.

25. Comment:

The TMDL target selected for phosphorus in the Lower Cuyahoga River is 0.12 mg/L. For phosphorus, there exists no numeric water quality criterion for aquatic life protection in the Ohio EPA's rules. The value of 0.12 mg/L is the median of total phosphorus concentrations measured in the Eastern/Ontario Lake Plain (EOLP) at small river sites where fish biosurvey scores exceed the Index of Biotic Integrity (IBI) criteria for Warmwater Habitat but (generally) not Exceptional Warmwater Habitat. It is the EOLP small river median phosphorus concentration of 0.115 mg/L in the IBI range of 40-49 on page 83 of Appendix 2 of Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams (Ohio EPA Technical Bulletin MAS/1999-1-1).

According to the data in the Ohio EPA Technical Bulletin, selecting the 95th percentile rather than the median would have resulted in a much higher phosphorus target of 0.37 mg/L. Ohio EPA acknowledges in the draft TMDL report that "it would be valid to argue that a 95th percentile of these values (to exclude outliers) would be protective of the respective aquatic life use." Nevertheless, Ohio EPA selected the median value because it provides an "implicit margin of safety."

U.S. EPA, in Section 4.2.1 ("Total Maximum Daily Loads") of its Technical Support Document For Water Quality-based Toxics Control (EPA/505/2-90-001), states the following: "The margin of safety is to take into account any uncertainties related to development of the water quality-based control, including any uncertainties in pollutant loadings, ambient conditions, and the model analysis. The size of the required margin of safety can, of course, be reduced by collecting additional information, which reduces the amount of uncertainty."

Ohio EPA has asserted the robustness of its database in promoting and defending its biocriteria program. Furthermore, in the draft TMDL report, Ohio EPA states, "Monitoring data were available extensively in the lower Cuyahoga watershed." The draft report also refers to a "plethora of available in-stream data." Considering the relative lack of uncertainty due to this unquestionably substantial database, a margin of safety of the magnitude implicit in selecting a statistic as low as the median for the phosphorus target seems excessively conservative - especially since an explicit margin of safety is also included in the TMDL.

Following are reasons for why the phosphorus target selected has a high implicit margin of safety and why it could be excessively conservative:

- The Cuyahoga River drainage area, at greater than 800 square miles, is near the upper end of the Ohio EPA range for "small rivers" (200 to 1,000 square miles). The Cuyahoga River is nearly a "large river" by Ohio EPA's definition. Ohio EPA has demonstrated in its Technical Bulletin that phosphorous concentrations are expected to increase with stream size. Selecting a relatively low statistic like the median assumes that the Lower Cuyahoga River should achieve phosphorus levels more typical of rivers with drainage areas near 200 square miles.

- The median value used for the target is from a biosurvey data set (IBI = 40-49) that includes more than sites that are just attaining the Warmwater Habitat criterion (IBI = 40). Some of these sites are nearly or fully attaining the Exceptional Warmwater Habitat criterion (IBI = 48). The Cuyahoga River is not designated Exceptional Warmwater Habitat, and its biota should not be expected to be comparable with these sites. Selecting a relatively low statistic like the median of values that include these sites assumes otherwise.

- The association approach described in the Ohio EPA Technical Bulletin and relied on here is itself implicitly conservative. This is because association is not necessarily cause-and-effect. Ohio EPA acknowledges this fact when commenting in the draft TMDL report that "full attainment can be observed at concentrations above this target." To select a relatively low statistic like the median for the target is actually an additional layer of conservatism on top of this implicit conservatism and the explicit margin of safety.

Nothing in Ohio EPA rules or guidance prescribes which statistic is to be selected for a TMDL target where the pollutant has, as in this case, no applicable numeric water quality criterion established in the State's rules. The phosphorus target is derived entirely from an Ohio EPA document that "is a technical bulletin and does not represent Ohio EPA policy." Ohio EPA clearly has the flexibility to select any appropriate statistic - including one that is significantly higher than the median.

Selecting a phosphorus target higher than the median could have the effect of significantly lowering or even eliminating the phosphorus load reductions required in the TMDL. The draft report does not provide sufficient justification for the implicit margin of safety used in selecting the target and especially in applying it to the river segment downstream of the Southerly WWTP.

One possible basis for a using a relatively high implicit margin of safety in the phosphorus target selection could be consideration of the effect of poor quality habitat. Phosphorus is more likely to have an adverse impact where habitat is of poorer quality, and a lower phosphorus target might be justified at such sites to "compensate" for the lack of suitable physical habitat. The draft report states, "Where habitat quality is poor, there is a complex interaction between the remaining biota and the pollutants heat, sediment, nitrate and phosphorus. This biologically mediated interaction can contribute to excessive algal growth and low dissolved oxygen, particularly during pre-dawn hours as algal colonies respire." Conversely, this could be used to explain the phenomenon of some sites fully attaining biocriteria despite phosphorus levels that exceed the selected target. An example of where this occurs is the Cuyahoga River segment in full attainment of biocriteria upstream of the Mill Creek confluence. However, Qualitative Habitat Evaluation Index (QHEI) scores reported for this segment (e.g., less than 60) are lower than in the segment between the Southerly WWTP and the Navigation Channel, for which the only QHEI score presented in the draft report (i.e., greater than 75) indicates that the habitat quality is high. Therefore, the presented habitat data do not support a higher implicit margin of safety for the phosphorus target that is applied downstream of the WWTP and upstream of the Navigation Channel. No need to "compensate" for poor quality habitat there has been demonstrated.

Another possible consideration is that, according to the draft report, sedimentation is a primary cause of impairment in the Lower Cuyahoga River. The draft report states, "Many implementation actions to reduce phosphorus will also reduce sediment loads since phosphorus binds to sediment as a delivery mechanism to the stream." However, this ancillary benefit will not exist in reducing phosphorus from WWTPs. Phosphorus in WWTP effluents is predominantly soluble and not associated with sediments. Although reducing phosphorus loads might, for some sources, be an adequate surrogate for sediment reductions, this would not be the case for WWTP effluents.

In conclusion, the draft TMDL report seems to say that phosphorus is considered a cause of impairment requiring load reductions because the phosphorus target is exceeded, and that the level of the phosphorus target was selected conservatively because phosphorus is considered a cause of impairment. Without presenting further evidence supporting the determination that phosphorus is a cause of impairment, this is a circular argument. The Lower Cuyahoga River TMDL must present such evidence to adequately justify requiring a reduction in phosphorus loads - especially for the river segment

downstream of the Southerly WWTP and upstream of the Navigation Channel. [2, 17]

Response:
USEPA nutrient criteria guidance suggests that a total phosphorus criteria of 0.033 mg/l be used for the ecoregion containing the lower Cuyahoga River (http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/sumtable.pdf, Ecoregion VII). If Ohio EPA had not performed state and ecoregional specific studies, the 0.033 mg/l value would be used as the target for this project. This is the 25th percentile statistic of all of the data available to the USEPA in this ecoregion, not just data from reference or unimpacted sites or just from Ohio. The USEPA and its Science Advisory Board recommended this as one approach to determining nutrient criteria. Alternatively, the 75th percentile statistic of a database limited to reference data only is also recommended. In Ohio, in the Erie/Ontario Lake Plain ecoregion where the Cuyahoga is, the 75th percentile of the reference data is 0.105 mg/l.

The Ohio EPA used the median value of the ecoregional data only in Ohio of all data collected, not limited to reference or attaining sites only. This value is 0.12 mg/l for small river warmwater habitat sites such as the Cuyahoga at Independence or downstream of the Southerly WWTP. These sites are in the range of 700 - 750 square miles drainage areas. However, the presence of the Lake Rockwell Reservoir and Dam (with a drainage area of 211 square miles) disrupts the natural hydrology of the watershed and in effect, reduces the drainage area of the lower Cuyahoga at times. Therefore, the Cuyahoga River in the vicinity of the Southerly WWTP is not 'nearly' a large river. In the reference document, a large river is defined as greater than 1000 square miles.

The data used to determine the 0.12 mg/l target comes from all sites expected to attain warmwater habitat. Some of these sites perform better than the warmwater benchmarks and some of these sites perform worse. Therefore, a median statistic of this data (which is not a relatively low statistic; it is a central or middle statistic) diminishes the expectation that a river meet an unusually high or low expectation such as the use of a 95th percentile as suggested by the commentor would. Further, this database is highly specialized to rivers of the same size and expected aquatic life and in the same ecoregion as the Cuyahoga River. This further reduces skewed expectations of the Cuyahoga by the use of data from other ecoregions or river sizes.

The use of the median statistic represents a margin of safety for the target development. A separate margin of safety is associated with the method of TMDL development, as described in Chapter 4. The assertion that there is a plethora of in-stream data in the report has to do with the method of the TMDL development NOT the target development. There is a large amount of data supporting the targets developed in the report *Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams*

(http://www.epa.state.oh.us/dsw/document_index/docindx.html). However, when you take this data and limit it by stream size, ecoregion, and aquatic life expectation you reduce the sample size. Therefore, it is appropriate to exercise some caution when selecting the appropriate statistic used to determine the target. The median statistic is a reasonable statistic to use and 0.12 mg/l total phosphorus is a reasonable target for the lower Cuyahoga River.

Figure J17 in Appendix J compares the TMDLs based on various targets with the existing data. This shows that the TMDL recommendations would not be largely different if the 75th percentile statistic (0.155 mg/l) was used instead of the median.

26. Comment:
Section 4.1.2 Allocation Methods. Was land use (not cover) considered in calculating total phosphorus and fecal coliform nonpoint source existing loads and allocations? Or is that data not available? [3, 12]

Response:
Land cover and how the land is used was considered in calculating the nonpoint source loads. Appendix J gives some of this information. Table J4 explains the general inputs for the FCLET model used to determine bacteria nonpoint source loads which include land use issues. Specific inputs to this model can be requested from Ohio EPA if desired. The total phosphorus nonpoint load was determined based on the total observed load less all the other known load inputs except for nonpoint sources. Therefore, this would incorporate the affects of land use.

27. Comment:
In general, the approach and calibration section is hard to follow for the non-scientist. Can there be a step down, flow chart graphic to help understand this? The charts in figure 9 need to be explained a bit more in the text. There is no legend. Pie chart is not legible. [3, 12]

Response:
It appears as if this comment is based on an early draft of the report. The public noticed report (http://web.epa.state.oh.us/dsw/tmdl/LowerCuyahogaDraftTMDL.html) already addressed these concerns.

28. Comment:
Section 4.1.3 Habitat goals. Do we have any QHEI scores above 60 in the study area? What percent is above 60? What percent is below? Give us a general summary (perhaps move the figures 18 and 19 into this text area). What about any coldwater habitat? Headwaters? Do they exist in the study area? Cleveland Metroparks is currently inventorying their headwater streams [3, 12]

Response:
Yes, there are QHEI scores above 60 in the study area. Figures 4, 21 and 22 show these sites. Figure 4 shows approximately 40% of the sites shown are at or above a QHEI score of 60. Figure 22 shows that 36% of the tributary sites are at or above 60. There are no designated coldwater habitats in the Cuyahoga watershed. There are many headwaters and many sites considered headwater sites in the watershed. Appendix D gives the QHEI scores for all of the sites evaluated in 2000. These sites are not specified as headwater sites per se; however, a river mile is given from which a headwater determination could be deduced. QHEI data sheets are included in Appendix M (Cuyahoga River and Tributaries, excluding Tinkers Creek watershed) and Appendix N (Tinkers Creek watershed).

29. Comment:
Section 4.4 TMDL Calculations: First paragraph is confusing. Check accuracy of table and figure numbering. [3, 12]

Response:
It appears as if this comment is based on an early draft of the report. The public noticed report already addressed these concerns.

30. Comment:
Table 9 on page 62 should describe more clearly the calculation and logic that goes into calculation of the fecal WLA term for MS4s. Also, data should be provided to show what the proposed load allocation and the waste load allocation would mean in terms of concentration reductions for stormwater sources. Further, the document should explicitly discuss achievability of waste load allocation for MS4s and the load allocation for unregulated runoff sources. [17]

Response:
The MS4 allocation for fecal coliform was a percentage of the original runoff allocation which included runoff from MS4 areas. This percentage was determined based on the MS4 area in the lower Cuyahoga as reported to the agency and the relative contribution urban land uses had to the overall allocated runoff load. Since MS4s are not currently required to collect flow or concentration data it would be difficult to determine or to discuss the concentrations of MS4s specifically. This lack of data is why the MS4 allocation was determined the way it was - as a portion of the total runoff load instead of using data from MS4s specifically. Figure 10 of the report demonstrates that the allowable total phosphorus runoff load is achievable as the allowable runoff load is well within the expected runoff load range based on data from around the nation. Specific data on these MS4s as well as a more detailed discussion would have been included in the report if the data had been available to the Ohio EPA at the time of completion of the project. Note that MS4 projects are required to have Best Management Practices (BMPs) associated with them. These BMPs will result in load reductions for the MS4 areas.

31. Comment:

More should be done to describe the level of resolution for the calculation of loads using FCLET on page 66. Also, more should be done to describe the level of resolution in calculation of the bacteria rate on page 68. Table 14, concerning fecal coliform TMDLs on page 80, shows that the two most significant terms by far are the load allocation and the loss or die-off term. These two terms offset each other. As shown in the table the value for both terms is 1.27 E+16 for between 1 to 10 % FDI. Apparently this is just a coincidence. Errors in estimation of these terms could substantially affect attainability of TMDL targets. [17]

Response:

It is unclear what the commentor means by the level of resolution for the calculation of loads using FCLET or the bacteria loss rate. The FCLET worksheet is available should the commentor wish to request it. Appendix J describes the FCLET model in more detail. The loss rate determination is calculated by a regression between the total observed load in the stream compared to the total input load to the stream on the days there were observed loads. The nonpoint source runoff load was a part of the total input load and this was calculated through the use of FCLET. It is therefore, not surprising that the loss rate and the runoff calculation are so closely related as the loss term is basically a correction factor for the FCLET estimates in addition to capturing the loss that is occurring. Typically, runoff is the largest component of bacteria load to a stream when looking at all flow conditions, and the values calculated by FCLET are in line with studies around the nation. Also, typically, there is a large loss or die off of bacteria over distances and time such as are associated with the lower Cuyahoga. Both of these terms are expected to be large in this watershed. Note that even though both terms mentioned above are 1.27E+16, the load allocation exceeds the loss term by 2.56E+12. It is just not visible in the tables using only 2 decimal places. Perhaps this, then, is the increased resolution the comment author seeks.

32. Comment:

Discussion of TMDL calculation starting at page 75 shows tables containing daily loads based upon hydrologic conditions. The text should clarify, if appropriate, that these tables are for informational purposes and are not to be used as the basis for regulatory action. If this is an incorrect interpretation, the achievability of the load allocation and waste load allocation should be discussed for each classified FDI range. [17]

Response:

These tables are informational in nature but they do contain the TMDL numbers per hydrologic condition. They can be used if regulatory authority exists to do so. However, other than for the NPDES permitting program, these numbers do not specifically guide regulatory permit actions at this time. The 28 percent reduction needed for low flow conditions will be used for regulatory action for total

phosphorus. It is readily achievable. Several best management practices have been found to achieve reductions within the ranges specified in the report. So, technically they are achievable. The uncertainty lies in the willingness of the landowners and other stakeholders to employ such practices. Further, there is a large reasonable assurance that much of the stormwater load will be reduced to the level shown in the report based on the long term control plans, studies, and funding being pursued by the Cities of Akron and Cleveland. The numbers listed in the report for the CSO loads and reductions come from the cities' reports and, therefore, are considered achievable.

33. Comment:

A statement is made on page 83 that the Total Maximum Yearly Load calculation in the proposed document represents "no change" for Southerly's "current fecal coliform limit". Some additional discussion is needed to clarify the point that permit limits are not intended to be changed to correspond to the calculated TMYL. Thus, while there may be short-term fecal coliform levels close to weekly or monthly permit concentration limits, experience shows that the yearly discharge count will likely be substantially below the level that would be obtained by summing all allowable shorter term discharge counts and will be in the range of the TMDL target. [17]

Response:

There are no individual WWTP total maximum yearly loads (TMYLs) published in the report. Therefore, it would be difficult to hold an individual plant to a particular regulatory yearly load based on this report. However, your concern is understandable. This response serves to indicate that it is not intended for the current permit limits of the WWTPs included in this TMDL to be changed to reflect the calculated TMYL.

34. Comment:

Low dissolved oxygen is described as a mechanism by which nutrients can impair biological communities, but no data showing low dissolved oxygen in the river segment between the Southerly WWTP and the Navigation Channel is presented in the draft report. Even under critical conditions, the dissolved oxygen content in the WWTP effluent is high and, especially with the effluent dominating the river flow under such low-flow conditions, the dissolved oxygen remaining high seems likely in the river segment downstream of the WWTP and upstream of the Navigation Channel. [2, 17]

Response:

Dissolved oxygen (D.O.) in the Southerly WWTP effluent may be high in dissolved oxygen initially, but the D.O. may become depleted due to biochemical processes that further assimilate the remaining pollutants in the Southerly WWTP discharge in addition to assimilation of upstream pollutants and respiration and/or decay of planktonic or sessile algal communities. Supersaturated D.O. in the river, as substantiated by recent NEORSD sampling, indicate the likely potential

for D.O. depletion when the algal communities crash and decay. Instream sampling 24 hours per day, 365 days per year to document when this occurs is not feasible and is one of the main reasons Ohio EPA relies heavily on the sampling of biological communities and multiple lines of evidence to assess water resources in the state. The wide fluctuation of D.O. concentrations in the river, even though D.O. depletion may not fall below a criterion, is a stressor on communities that can adversely effect survivability when compounded with other chemical, physical and biologic stressors placed on aquatic communities in the Cuyahoga River.

35. Comment:

A comment was received concerning the Ohio and Erie Canal and its current use designation. [1]

Response:

The Director of Ohio EPA is responsible for issuing and implementing water quality standards. Part of water quality standards involves assigning "waters of the state" a use designation. The Ohio and Erie Canal is considered "waters of the state" and is assigned a use based on those available to the director. Uses available include limited resource water, modified warmwater habitat, warmwater habitat, and exceptional warmwater habitat. Complete list is described in Ohio Administrative Code Chapter 3745-1-07(B). Of the available designations, the appropriate designations assigned to the Ohio and Erie Canal are modified warmwater habitat and limited resource water.

36. Comment:

Page 55, section 4.1.2 Application of Water Quality Targets - In the second paragraph the TMDL report again relates attainment of biological criteria to target loads. We do not disagree with the importance of biological use attainment measurements but rather that the report has accurately designated phosphorus as the "critical pollutant" that when reduced will result in attainment of these criteria. If, as we have suggested in numerous comments, P loading is not the proximal cause of dissolved oxygen deficits then effort spent to control phosphorus will be a costly failed experiment.

The third and fourth paragraphs in this section are unclear. The concept of using QHEI as a surrogate is somewhat difficult to begin with but these two paragraphs do not at all elucidate how QHEI targets will be applied.

Also, in the fourth paragraph of this section reference is made to the "surrogate pollutant $CBOD_5$". The rest of the TMDL does not seem to look at CBOD loading. Is this a holdover from an earlier draft? Does Ohio EPA feel that Akron is using CBOD as a "surrogate" for nutrients? If so the Ohio EPA has misunderstood the approach and goals of the LTCP. [16]

Response:
The QHEI is a surrogate for the pollutants listed. This language is intended to bridge habitat issues, which are not load based, to pollutants that do have loads, thus connecting the vital habitat component with the load-based platform on which the TMDL process is built. The intent of the TMDL process is attainment of water quality standards. In Ohio, this means biological criteria as well as chemical. In order to attain our biocriteria we cannot limit TMDL projects to load based pollutants only, as this would not result in accomplishing the intent of the TMDL process. The cited language is an important component for U.S. EPA with respect to this issue as it reviews the report against TMDL requirements. We regret the language is confusing and will work to clarify future TMDLs. The QHEI targets will be applied as any other target discussed in this report – basically as a desired endpoint to help guide actions to achieve it. The reference to $CBOD_5$ is only as an example to assist people in understanding the surrogate nature of the QHEI. It does not refer to the Cuyahoga specifically and is standard reference text that has been used in several TMDLs.

37. Comment:
Page 55, 4.12 Application of Water Quality Targets, 1st paragraph – The 3rd sentence does not express a clear thought. There is no stated recreational standard in this report including Appendix K. [16]

Response:
Appendix K states the recreational standard. Most segments are Primary Contact Recreation (PCR). Table 3 explains this standard.

38. Comment:
Page 56, 4.13 Linkages Between Water Quality Impairments and Pollutants -1st paragraph– Change the 1st sentence to read "Phosphorus and bacteria ~~are~~ as shown <u>have been</u> identified <u>as the</u> impairing causes…" [16]

Response:
This would change the intent of the original statement. Phosphorus and bacteria are impairing causes as are dissolved oxygen and habitat.

39. Comment:
Page 56, Section 4.1.3 Linkages between Water Quality impairments and Pollutants - This section generally suffers from the same weaknesses discussed in comments above. Without direct causal linkages, control of phosphorus may not result in the expected improvements. The linkage expressed here between sediments and phosphorus further confounds the assertions made in other sections.

While certainly phosphorus binds to soil and sediment materials, these forms of phosphorus are generally not bio-available. The dissolved inorganic form of phosphorus PO_4 is readily available for assimilation by algae and is generally

NOT controlled by the control of sediments. Other dissolved organic forms of P also provide routes for release of bound phosphate that can become bio-available. The dynamics of these interactions are not thoroughly understood in rivers.

In the second paragraph of this section the statement is made that heavy sediment load limits algal growth. Since phosphorus addition will stimulate algal growth the loading of both sediment and P or sediment laden with P will clearly have some balancing effect. The degree of that balance is not understood and certainly is not clearly expressed here. Also the concept that reduction of algal growth is entirely beneficial to dissolved oxygen ignores the production of dissolved oxygen through photosynthesis which is a significant mechanism for maintaining daytime dissolved oxygen during hot weather when saturation goes down. [16]

Response:
The linkage made here between sediment and total phosphorus is only to point out that nonpoint source best management practices tend to remove total phosphorus from the stream by limiting the sediment that enters the stream because of the binding of phosphorus to sediments. This linkage does not confound assertions made in other sections as far as Ohio EPA can ascertain, as there are no specific references for such assertions provided by the comment author. We agree that control of sediments does not generally control dissolved phosphorus; we are not making this point in the TMDL. Nor are we are discussing any balancing of sediment and phosphorus affects on aquatic life. The section simple states that a reduction of sediment will occur as an incidental result of typical controls for non-point sources and delivery mechanisms of total phosphorus. This reduction of sediment load will also contribute to improvements in dissolved oxygen. No other implications or interpretations should be made from this paragraph.

40. Comment:
Page 57, 4.2.1 TMDL Development: Load Duration Curve, Figure 7 and page 59, 4th paragraph – The duration of the flow data is not stated. Is the entire period for 1929 through 2002 as indicated on page 59? If it is, prior to 1962 (start of operation of LaDue Reservoir) the flow data at Independence is not valid. Lake Rockwell, Munroe Falls, Gorge and Station Road dams do not ameliorate high flows. LaDue Reservoir did improve low flow by capturing and releasing flow to keep Lake Rockwell full or at high flows. Most importantly, the agreement between ODNR and Akron (which Akron started implementing on October 22, 1997) has increased the low flow from Lake Rockwell by 3.5 MGD (5.4 cfs) versus periods of no flow up through 1992. Construction in 1991-92 at Lake Rockwell caused no overflow for periods of time.

Per the agreement, ODNR is to release an amount of water from the Tuscarawas River (Portage Lakes) through the Ohio Canal based on water that is delivered to

the water districts outside the Cuyahoga River Watershed and that is not returned by sewers to the Cuyahoga River. This will increase low flows in the Ohio Canal, Little Cuyahoga River and the Lower Cuyahoga River below RM 42.27). [16]

Response:
Figure 7 is based on the full period of record from 1929 through 2002. The flow duration intervals used in the load duration curves are based on the 1985-2002 period only in order to address the reservoir issues. Figure 7 is an example of a flow duration curve as stated in the text. The ODNR agreement with Akron concerning Lake Rockwell still contains a provision for complete shut off of the outflow of the reservoir. Using flow data during a time where this was occurring is not unreasonable or faulty. The other changes since 1985 do not change the flow duration curve significantly as the flow discussed is very small.

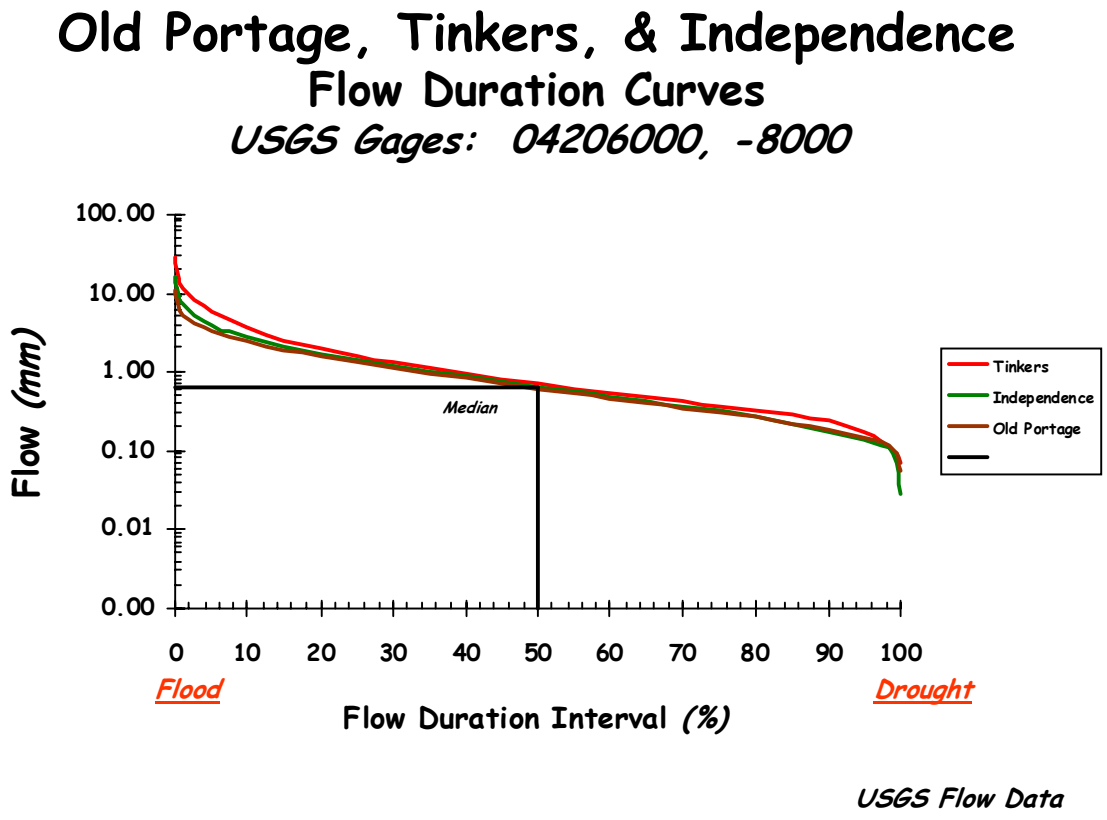
41. Comment:
Page 58, June, 2003 Draft (approximately page 58) – This earlier draft made a statement that the USGS gages on the Cuyahoga River at Independence, Tinkers Creek at Bedford, and Yellow Creek at Botzum were used to develop flow duration curves since they were active at the time of this TMDL and had a significant period of record.

It further states that the gage at Old Portage, although active, was not used as it was impacted by construction activities in its vicinity during the time of the TMDL. The only construction in the vicinity of the Old Portage USGS gage was for the Portage Path – Akron Peninsula Road widening and bridge, which occurred from July 2001 to mid-August 2003. If the flow data for the other gages were conducted in 2000, or 1929 to 2003, why wasn't this gage information used?

It would have materially and significantly added to the needed data to determine a flow duration curve on the immediate upstream and downstream sections. It could be significantly different than the information at Independence. If nothing else, a simulated flow could have been determined for the period of time in question by comparisons with the other gauges when not in question. Most interesting is the variance of flows between the Hiram and Old Portage versus Independence gauge that was used in the 1991 and 1996 water quality studies (Figure 23, page 81 of the August 19, 1994 study and Figure 6 in the August 15, 1999 study). [16]

Response:
In addition to the uncertainty introduced by construction activities, there was little stream chemistry data available at this gage (compared to the Independence gage) on which to base TMDL allocations or other decisions. While interesting to examine, the flow duration curve did not appear to add new or needed information to the TMDL. The flow duration curve comparison of Tinkers, Portage, and Independence is included below. How would a flow duration curve

at Old Portage substantially assist the process? What additional information to the TMDL itself would it have given? It is downstream of all of the reservoirs and the majority of the CSOs. A more useful gage to have had would be the now defunct gage on the Little Cuyahoga River. Unfortunately that gage is no longer running, but would be useful to Akron to have to monitor stream flow as part of their CSO management and storm runoff programs.



42. Comment:
Page 58, Table 8 – Are these the WQS referenced in the first paragraph under Section 4.1.2 on page 55, or should these WQS be in Appendix K? The LDCs (load duration curves) for upstream and downstream of Old Portage is very likely different than at Independence. [16]

Response:
The values in Table 8 are targets for total phosphorus and criteria for bacteria. WQS are the combination of criteria and the use designation; see Table 3 in the report for more information on this. Table 8 values are not WQS, although the bacteria criteria are a part of the WQS of the lower Cuyahoga River. Appendix K lists what particular criteria types are applicable to the Cuyahoga not the values themselves, except for the ship channel which has some special criteria associated with it.

It is unclear what the comment author was intending with the rest of the comment concerning the LDCs upstream and downstream of Old Portage. Perhaps this may have been an add-on to the previous comment. At any rate, the answer is yes: a LDC at Old Portage would be different from a LDC at Independence but not substantially so. The shape would be very similar, only the load itself would be different as there is less flow at Old Portage than at Independence.

43. Comment:
Page 58, 3rd paragraph, Second Data Source – If the USGS data relates to the 1993 USGS (Fancy, et al) study, this data is outdated and does not relate to the greatly-reduced Akron CSO and WWTP secondary bypass flows. It should not be used in this report. [16]

Response:
The data are in-stream collected by the USGS at the Independence gage and at Harvard Road. It spans from 1985 through 2000. Note that the allocations are based on data limited to the 1996 - 2002 time period.

44. Comment:
Page 60, Figure 8 – Why is this limited to 1985 – 2001 when it was noted on page 58 that Heidelberg College has almost daily chemical grab samples from 1985 through 2002? Based on Akron's continuous release since October 22, 1997 and substantially reduced Akron CSO and WWTP secondary bypass, since 1999, these curves should be produced for the 1999 – 2002 period (see comment to use of the 1993 USGS study mentioned on page 26). [16]

Response:
Figure 8 upper graph should state 1985 – 2002. The lower graph does isolate each year from 1985-2001 (there wasn't a complete summer's worth of data for 2002). Each dot represents the total observed summer phosphorus load per year at Independence. Every dot including those representing 1999-2001 are substantially above the TMDL target.

45. Comment:
Page 61, Table 9 - category of "reservoir releases and diversion" should be termed "Upper Cuyahoga, Mogadore and Canal Return"; and Page 63, Section 4.1.2, first paragraph: change description of sources including "reservoir releases and diversion" to "Upper Cuyahoga, Mogadore and Canal Return."; and Page 63, Lake Rockwell Reservoir Release – This should be changed to Lake Rockwell Reservoir Release to Upper Watershed Release. [16]

Response: An explanation of the terms has been added to section 4.1.2 under Reservoir Release, Tuscawaras Diversion, and Point Sources. In addition your comments on terminology as a part of this responsiveness summary will be a part of the TMDL report and serve to best illustrate your concerns on this issue.

46. Comment:

Page 61 & 62, Table 9, Overview of the Lower Cuyahoga TMDL Development Process 3b: The daily flow releases and sporadic quality data for Lake Rockwell is by the City of Akron. Any return of flow equal to water delivered outside of the Cuyahoga River Watershed is determined by ODNR.

Not shown is the long-established diversion by ODNR of the Tuscarawas River through the Ohio Canal by ODNR. Not shown is the 4 MGD release by the City of Akron from Mogadore Reservoir. Where are the releases by other entities from reservoirs such as from Lake Hodgson by Ravenna, Plum Creek Reservoir by Kent, Wingfoot Lake by Goodyear, etc.? [16]

Response:

The ODNR is the source of the diversion flow data has been noted in Table 9. The reservoir releases from Lake Hodgson, Plum Creek, and Wingfoot have not been mentioned in any stakeholder meetings of which Akron attended. Are these releases continuous and of a significant flow? Is there any data on them? Ohio EPA has asked for such data for over two years now. No information has been forthcoming on these. Unaccounted for sources were covered by the way the non-point source load was calculated. The report acknowledges that unknown sources may be included in the non-point source category and as such they are included in the TMDL calculations.

47. Comment:

5iii: The weighted average of 6% for future growth. Is this an annual percentage growth rate? As noted later on, the July 10, 2003 Akron Beacon Journal article articulates the significant decline in big city populations (since 1970) and changes for Summit and Portage Counties. For the area in Summit and Portage Counties within the Little Cuyahoga River Watershed, the 2000 to 2003 figures show an annual population increase of +0.36%. Cuyahoga County population change needs to be reviewed versus the 6%. Comment also applies to Page 68, Future Growth. [16]

Response:

The 6% future growth is the increase expected by 2015 as shown in Appendix J, section J.3.7. Appendix J shows the expected growth rates as determined by the US Census Bureau. The population of Cuyahoga County is declining, which was taken into consideration in this determination.

48. Comment:

Page 63, Allocation Methods, SWAT model - Was the SWAT model built or not? It is not clear. Does the prediction in Figure 10 come from that model?

Deriving the total phosphorus load from “runoff” by subtracting known sources from measured totals is at best a rough approximation. Has an analysis been

done to determine the sources of error and the degree of accuracy and precision of this subtraction method? If all the numbers are based on annual averages it would seem at a minimum that the 95% confidence intervals around the means (for all P sources) should be reported and analyzed.

Is the prediction from Figure 10 from this subtraction method? If so, how is there a range of predictions? Were different years used? The description of Figure 10 is inadequate. The graph seems to show that the median predicted load is close to the "allowable" run-off load? Is the median based on a range of export coefficients or a range of years? [16]

Response:
The SWAT model structure was created but not calibrated. It was used to examine the land use and soil characteristics of the watershed. Figure 10 results do not come from SWAT although SWAT contributed information used in calculating values in Figure 10. See Appendix J section J.3.2 for more information.

The method used to estimate the non-point source runoff load was an approximation. The estimated load is the unaccounted-for load once the knowns have been subtracted out. This method works as an approximation for this project because there was daily total phosphorus data in-stream and for most of the model inputs. Having such a large amount of data reduces the errors and uncertainties associated with this approach. However, it was important to compare this load to a load calculated using a different approach. That is what Figure 10 is showing. An actual accuracy or error analysis was not done as this method is not a predictive method. It reflects what is actually happening in the river, based entirely on daily observed data over many years. It also ensures that other unaccounted for minor loads be included in the analysis – an advantage this method has over predictive modeling approaches that can miss such sources.

An expanded explanation for Figure 10 has been included in the report. The existing runoff load (the left column for each pair) is from the subtraction method. The allocated runoff load is the darker column on the right. The export coefficient method as explained further in the report and Appendix J has a range of coefficients per land use. The hi/lo bars in Figure 10 show the range of predicted load based on this range of coefficients with the median export coefficient-based load marked with a plus sign. The over prediction as shown for years 1996-1998 may have something to do with unaccounted for sources or a source that was under predicted. The CSO loads were based on the data from Akron's modeling. However, this modeling was based on 1994 data. It is possible that it was under predicting the load to the system. If that was the case the subtraction method captures this additional load and labels it as non-point runoff. Fortunately, the load is still captured in the TMDL analysis. Note that the non-point source loads come within range of the export coefficient predicted

loads after Akron made improvements to their system. This could be coincidental of course, but there is definitely a change in the subtraction method load beginning in 1999.

49. Comment:
Page 63, 4.12 Allocation Methods- The 4.1.2 section numbering is the same as that on page 50, Application of Water Quality Targets. This should probably be 4.2.2. Also, the Table of Contents needs to be changed to reflect the Section 4.1 background of TMDL development approach. [16]

Response: This has been corrected.

50. Comment:
Page 63, Point Sources – Does this include sewer collection system malfunctions (breaks, malfunctions, SSOs and U.S. EPA's new SSO definition)? What about releases from Lake Hodgson and Plum Creek Reservoirs? There is no mention of the positive aspect of pollution trapping of Lake Rockwell, Lake Hodgson, Plum Creek Reservoir, Gorge (Ohio Edison) Dam and Station Road. [16]

Response:
No, this does not include sewer collection system malfunctions. The response to comment 46 addresses the reservoir releases. Chapter 4 does not discuss either the negative aspects of reservoirs or the positive ones. A source is not 'bad' or 'good'. Like groundwater, labeling a source, as from a reservoir, only denotes where it came from without making a judgment about the source itself. The Lake Rockwell outflow is a source to the system regardless if the reservoir itself is a contributing factor to the outflow quality.

51. Comment:
Page 63, Non-Point Sources – The land cover data came from the USGS 1992 Ohio National Land Cover Data (NLCD) data set.
2nd paragraph, 1st sentence – The Cuyahoga RAP has produced more current (2002) digitized land cover maps. Why use the outdated information? [16]

Response:
After a call for additional data was issued in January of 2002, the TMDL project proceeded with the information available beginning in summer of 2002. The new RAP cover maps were not available until the modeling was substantially completed. Future work in the watershed will certainly take advantage of the updated information.

52. Comment:
Page 64, Table 10, Land Cover – Show a separate section for Independence to ship channel (Harvard Road). Given the mapping error on Figure 3 and Figure 9, these figures are very suspect (i.e. Wingfoot Lake extends into Stark County).

The Lower Cuyahoga River TMDL starts at Munroe Falls Dam versus Lake Rockwell. How this information downstream from Lake Rockwell depends upon inclusion of all point sources and inclusion of the land area from Lake Rockwell to Munroe Falls Dam including all tributaries. It is unclear how this information is being used. [16]

Response:
Table 10 has been modified. Given the way the lower TMDL was calculated based on observed data using an empirical approach, the middle section of the Cuyahoga had to be included in the analysis as well. It could not just start at Munroe Falls Dam as there is little data there to characterize either flow or water quality to define the input from the upper watershed. The information from the middle section is needed and is used to properly characterize the loads to the Independence gage where the daily data was available.

53. Comment:
Page 64, Figure 9- Areas 6 and 8 are shown incorrectly. Area 6 includes LaDue Reservoir, the western extension west of Auburn Road tributaries along Munn Road into western Auburn Township, and northern extension to Music Street in Newbury Township. This is in addition to the northern branch (downstream of LaDue Reservoir Dam) that extends into Snow Lake, Lake Kelso, Burton Lake, Little Punderson Lake, and Lake Punderson. Most of Black Brook Watershed is tributary to LaDue Reservoir (completed in 1962). The flow from the Black Brook Watershed generally is discharged through LaDue Dam and gates. LaDue Reservoir, including Black Brook and Bridge Creek, can be released through the Black Brook Dike Outlet. This information/observation is made now for consideration with the forthcoming Upper Cuyahoga River TMDL.

Area 21 – The drawing incorrectly includes Union Oil Tributary, the Upper Cuyahoga River, and Mogadore Reservoir which is part of Area 15. Area 21 does not show Congress Lake and its extension into Stark County. Area 21 includes Breakneck Creek (including Congress Lake Outlet), Plum Creek, Fish Creek, and Twin Lakes.

Area 15 – In addition to Wingfoot Lake and its watershed, it includes Springfield Lake and its watershed. Further, the Ohio Canal, Summit Lake, Nesmith Lake, Tuscarawas River (Portage Lakes) must be included due to ODNR historical diversion and recently negotiated ODNR-Akron release. [16]

Response:
These subwatershed divisions were created in SWAT from a utility in the model that has difficulty in dividing very low gradient land areas such as those found around the Congress Lake area. SWAT was not used to model the stream hydraulically and the way the steams were linked do not affect the results of the TMDL.

54. Comment:

Page 65, Total Phosphorus – In light of the available data from Heidelberg College grab samples through 2002 (page 58), why does this figure stop at 2001? The phosphorus shown does not seem to compare with that in Figure 8 (May to October). Without the Technical Support Document, accurate land area, and load factors per type of area, it is difficult to correlate.

It is assumed that the "existing runoff load" in Figure 10 is the observed load at Independence. Is the "expected load" (5th sentence) the TMDL LA (load allocation)? This is confusing and needs to be better explained/shown. Is the vertical axis (on Figure 10) a total phosphorus annual runoff load?

If the figures (in Figure 10) are inaccurate, then these figures are very suspect. This would explain the reason why the alternate method does not compare with the observed runoff load at Independence.

If this procedure is for non-point source loadings, it is assumed the loadings from all existing point sources (WWTP's) above Lake Rockwell and septic tanks has first been deducted. The CSO area must also be deducted. Does the literature take into consideration the areas served by sanitary sewers in determining the loading criteria for areas served by sanitary sewers? As an example, the phosphorous concentrations at Akron's WWTP are shown on attached Table C. As shown in Table C, the influent flows for the 1998 – 2002 period have decreased versus the 1993 – 1997 period (especially in the last four years). This is a result of the economic downturn, I/I reduction, sewer collection system repairs/replacement (esp. at river crossings).

Unfortunately, at the time of CSO monitoring for the CSO LTCP, the City and its consultants did not know of OEPA's growing concern that phosphorous was becoming a pollutant of concern or the CSO could have been monitored. An alternate would be to look at Akron's computerized records to determine influent phosphorous concentrations during high flows when CSOs are active and when secondary bypass was occurring. [16]

Response:

The Heidelberg College data was complete through March of 2002. Therefore, a summer load for 2002 could not be calculated. The phosphorus loads of the two figures make sense for what they represent. Figure 8 shows the total summer observed in-stream load at Independence. Figure 10 shows the total annual load for just non-point source runoff.

The existing runoff load is the runoff load calculated using the subtraction method not the observed load at Independence. The expected runoff load is the runoff load calculated using the export coefficients. These are annual loads.

The export coefficient predicted runoff load and the subtraction method runoff

load compare favorably from 1999 on. The most likely reason there is more load than expected using the subtraction method is due to unknown, unaccounted for, and/or under predicted loads from sources that are not necessarily non-point sources. For example, the improvements you mention below show up in this graph from the 1998 period on. Before these improvements were made these sources would have been included as non-point source runoff load as calculated by the subtraction method and is likely one of the reasons the runoff load (from the subtraction method) in years 1996 and 1997 is so high.

55. Comment:

Page 65, Section 4.1.2 "Total Phosphorus," first paragraph: "reservoir releases" are not a "source of load" and the phrase should be changed to "Upper Cuyahoga Input." [16]

Response:

Reservoir releases are a source of load. The outflow from Lake Rockwell is the upper Cuyahoga input. Explanations provided in the text should help to clarify this.

56. Comment:

Page 66 - The FCLET tool developed by U.S. EPA appears to generate a range of bacteria loading that are consistent with those observed. It is interesting to note that the cfu/day predicted loadings are on some months greater than the annual loading (cfu/year) presented later for the Akron CSO & bypass. [16]

Response:

The greatest overall bacteria load to the system on an annual basis appears to be non-point source runoff. However, the FCLET tool may be overestimating this value. Limited data existed in-stream during rain events at other locations in the river to verify these high values except for in the CSO area. In addition, the information for the Akron CSO study may have been underestimating the load from Akron's CSO system.

57. Comment:

The comment author made several requests for wording changes:
Page 67, Section 4.1.2, subheader and first line of text: change "Reservoir Release, Tuscarawas Diversion and Point Sources" to "Upper Cuyahoga, Mogadore, Canal Return and Point Sources." Change the second sentence, from "Rockwell Release" to "Rockwell Outflow."
Page 71, Figure 13 - change *five* references from "Rockwell Release" to "Upper Cuyahoga Input."
Page 72, Figure 14 - change *two* references from "Rockwell Release" to "Upper Cuyahoga Input."
Page 77, Figure 15 - change "Rockwell release" to "Upper Cuyahoga Input."
Page 78, Table 13 - change "reservoir release" to "Upper Cuyahoga and Mogadore."

Page 79, Figure 16 - change “Rockwell release” to “Upper Cuyahoga Input.”
Page 81, Table 15 - change “Reservoir and Diversions” to “Upper Cuyahoga, Mogadore and Canal Return” or accurate abbreviation thereof.
Page 81, Table 16 - change “Lake Rockwell Release” to “Upper Cuyahoga Input.”
Page 82, Figure 18 - change “Lake Rockwell Release” to “Upper Cuyahoga Input.”
Page 83, Table 17 - change “Release (Res + Div)” to “Upper Cuy. + Return.” [16]

Response:
Text has been added to clarify the terms; however, the terms have not been changed.

58. Comment:
Page 67, Section 4.1.2, “Point Sources,” and Figure 16 : This section states that the calculation for TMDL included several “major” WWTPs, including the City of Ravenna WWTP. Inexplicably, the TMDL omitted the Franklin Hills WWTP, which is downstream of Ravenna and meets the definition of “major source” as defined in Section 3.3, and whose detrimental impact on water quality in the Cuyahoga mainstem is well-documented. This omission would seem to have the effect of understating the contribution of the Middle Cuyahoga dischargers as expressed in Figure 16. [16]

Response:
The Franklin Hills WWTP has a design flow of 1 MGD. It, therefore, just meets the definition of a major WWTP (any facility with a design flow of 1 MGD or greater). However, this study used actual flows not design flows. Franklin Hills WWTP median flow is less than 1 MGD. The addition of Franklin Hills WWTP to Figure 16 would not be visibly noticeable and the contribution of the Middle Cuyahoga dischargers are not understated. Note that the Akron WWTP has a design flow of 90 MGD.

59. Comment:
Page 67, Reservoir Release and Point Sources - 2nd sentence – Akron samples upstream of Lake Rockwell for phosphorus, etc. but not for fecal coliform. [16]

Response:
This has been clarified in the text.

60. Comment:
Page 67 & 68, Combined Sewer Overflows – The greatly reduced CSO and secondary bypass flows versus those used for the CSO LTCP and during the 1996 (the date of the previous water quality study) are shown in attached Tables A and B. Did the report utilize fecal coliform load collected by the City of Akron? [16]

Response:
The majority of CSO and bypass information used in the study came from the City of Akron.

61. Comment:
Page 68, 3rd paragraph – A phosphorous concentration that best fits the observations at Independence, or by literature values, can not be accepted. Rather, the previously mentioned method of looking at influent phosphorous concentrations at Akron and NEORSD WWTP's during high flows (when CSOs were likely to occur) would approximate CSO phosphorous concentrations. (See Average Phosphorous Concentrations in Table C) [16]

Response:
The table referred to in the comment was not included in the comment, so we cannot respond at this time.

62. Comment:
Page 68, Second paragraph - The estimation of CSO phosphorus concentration from literature values may be inappropriate. Measurements of phosphorus in the Akron WWTP influent stream during wet weather could have been used as a check with these reported literature values. This data is collected routinely and reported to Ohio EPA.

Third paragraph - The method for load allocation does not take account for the unknowns in the implementation of CSO control technology. The specific properties of CSO disinfection systems are not yet clearly understood and are generally (and conservatively) adopted from systems at WWTPs. Specific CSO disinfection systems may or may not be capable of performing at the projected level of efficiency. In the case of bacteria kill or phosphorus removal slight differences in efficiency of individual control points under a range of storm conditions may result in "violations" of any limits set based on predictions generated by these planning level numbers.

In stream Reactions (loss) - The discussion of phosphorus loss in the first paragraph points out some of the many reasons that phosphorus dynamics is poorly understood in stream environments. Without better knowledge the very precise target that the OEPA has developed by indirect correlative evidence is not scientifically supportable. Adding loss term to calibrate the mass balance is certainly not invalid but knowledge of what specific mechanisms truly account for that loss would provide important information to help define the importance of phosphorus as a source of impairment to the aquatic community.

The modeled decay of fecal bacteria based on the USGS study is probably a reasonable estimate. It should be noted that the USGS study was performed during a period when the disinfection at the Akron WWTP was undergoing a significant upgrade and did not have the capacity to disinfect all secondary

bypass. The current system does disinfect bypass. The decay rates should not change even if the initial loadings were not representative of current conditions.

The exponential regression approach that has apparently been used does not seem to be at all soundly applied. How can regressions with R2 values of less than 0.4 and 0.13 be used as predictive of anything? In most research setting regression relationships of less than R^2 of 0.9 are not considered significant and generally good modeling relationships are built on regressions of 0.95 or higher. The fact that the annual average prediction is within 10% of the actual cannot be substantively linked to the methods and data used for deriving it. A verifiable method should be developed for calculating bacterial decay that is statistically valid and linked to reproducible observations. [16]

Response:
The raw influent monitoring station 601 for the Akron WWTP does not have total phosphorus data reported in the monthly operating reports. The 602 station data would not be appropriate because this water has received some treatment prior to being measured.

The margin of safety accounts for such unknowns and uncertainties as those mentioned above. If a range of efficiencies for a treatment control was published, the middle value of the range was used; otherwise, the published value was used. The allocated loads for CSOs specified in the report are not load limits; rather, as explained in the report, they are guidelines or estimations of the results in the LTCPs.

Factors affecting the assimilation of TP in a stream are explained in the report *Association Between Nutrients, Habitat, and the Aquatic Biota in Ohio Rivers and Streams* (Ohio EPA Technical Bulletin MAS/1999-1-1). These factors cannot be quantified individually per se with the existing technology. However, the estimation of the loss approach used here reflects the combined effect of these factors.

A decay rate such as determined by the USGS cannot be applied to diffuse sources over large areas. It can be used to determine the decay from a specific load input at a specific point in time. This would not be applicable in this project.

The seemingly low R^2 values in the regression analysis are actually quite high given the analysis parameter is bacteria with concentrations ranging between several orders of magnitude. Good modeling relationships are most often based on regressions much less than 0.95 or even 0.9. Only in very small areas will such very high R^2 values be seen in modeling.

63. Comment:
Page 69, 4th paragraph – As noted previously and shown on Tables A and B, the Akron CSO LTCP shows much higher existing volumes for CSOs and secondary bypasses than has occurred since 1999. [16]

Response:
The CSO allocations are based on the final conclusions of the LTCP which reflect such volume changes.

64. Comment:
Page 70, General Approach and Calibration - The logic presented in the fourth and fifth paragraph of this page is that the estimated proposed load reductions from Akron CSO and other point source control plans are adopted de facto as part of the TMDL and then the remaining load reduction needed to meet the "targets" is achieved by reducing a portion of the non-point source loads. While the report asserts that "this approach is reasonable" it is only reasonable as a modeling approach and not as a mechanism for defining the appropriate allocation of pollution control resources.

The CSO and other point source dischargers have defined achievable reductions in loading by detailed analysis of their discharges and appropriate control technologies for those discharges. The result of that analysis is in most cases an expensive approach to load reduction. The analysis of reduction in non-point loads should be broader than the simple share of what's left to meet target approach defined here. In order for the TMDL to be successful, the same level of detailed analysis of technologies and management practices should be applied to non-point sources to determine which controls will reduce what pollutants. The total annual load from Akron CSOs and bypasses (prior to CSO control) as calculated by these methods is less than 4% of the remaining load after 59% reduction in fecal bacteria in runoff. Given the lack of a detailed plan for achieving the reductions in "runoff" bacteria, control of CSO sources of bacteria (bypass bacteria are currently killed by the improved disinfection system) will not produce a noticeable change in the exceedences of water quality criteria.

The figures presented on pages 71 and 72 are very difficult to interpret and even in color are not clearly legible. The report should provide larger clearer figures to support the discussion. The figures seem to support the assertions made above that Akron CSO sources are a small proportion of the load and that the streams are dominated by loads that are attributed to runoff or to upstream inputs. [16]

Response:
It is unclear how the lack of a detailed plan for achieving the non-point runoff reductions affects the CSO LTCPs which estimate a 98% reduction in current CSO loads. Ohio EPA acknowledges that a more detailed non-point runoff analysis would add value to the process; however, the success of the TMDL is not determined by the level or detail of a rigorous model as that expends more

resources than it would take to implement obvious control strategies. A more rigorous non-point source analysis is not needed until and unless the more common sense implementation actions are completed. The TMDL approach demands an iterative process; more rigorous tools will be developed as the need arises.

65. Comment:

Page 73 Habitat Goals - This section is not at all clear. The conclusion seems to be that QHEIs will be used to monitor habitat restoration and sediment load reductions. Habitat restoration seems to be proposed in the report as a potential management practice to reduce loading from the non-point source land uses. Wouldn't it make more sense in the context of a TMDL to measure the success of a TMDL driven habitat restoration project by the achieved load reduction? If we restore a stream to a certain design criteria we will meet (at least in the near term) any QHEI that we choose. If the restoration is not an effective mechanism for bacteria or P load reductions we will not measure that with a QHEI. Similarly, sediment load reductions should be measured by sampling sediment or TSS load before and after a restoration project (though sediment is not targeted by the proposed TMDL).

Many of the earlier comments apply to the somewhat redundant discussions on pages 74 -80. The distribution of loads across different flow regimes seems to be a useful (though somewhat cryptic) method for examining the relative influence of different sources. [16]

Response:

The section has been clarified in the report.

66. Comment:

Page 81, Table 16 - The summary table presents the clearest picture of the results of the logic used in developing this TMDL. This table proposes that it is required that CSO and septic system bacteria loads be reduced by 98 and 36 percent respectively. The total existing load from these two sources, combined, is less than 4% of the proposed "reduced" load of runoff alone. If an additional 1.5% reduction were required (and achieved) in runoff controls the same total load reduction would be achieved. The reports method of back calculating the load reduction required in runoff makes the requested 59% reduction entirely arbitrary. Since the proposed TMDL does not provide any measurable way to achieve the 59% why not set it at 61 or 65. The arbitrary nature of this reduction percentage makes it difficult to justify the expense required to meet the planned reduction goals for Akron CSOs and Septic systems.

The proposed phosphorus target was apparently derived the same way. The reports estimated phosphorus loading reduction from CSO plans based on some derived values for nutrient removal from proposed treatment. The manner of this derivation is not clear and should be detailed to support the assumptions made in

the report. The City of Akron did not use nutrient reduction as a target for CSO control and did not estimate the percent reduction that would be achieved for nutrients with the proposed remedies. Appendix J does not provide enough detailed calculations to clearly illustrate the process used to derive the assumption that the proposed controls would achieve 87% phosphorus removal. The use of a literature value for estimating CSO phosphorus concentration introduces a significant source of error. As suggested earlier, it would have been better to estimate CSO concentration from the influent phosphorus received at the WWTP on wet weather days. Akron has based their plan and control technologies on control of sources of CBOD which may or may not result in a proportional reduction in phosphorus load.

Given the possible error in estimating the efficiency of the proposed CSO controls for nutrients, the City of Akron may have difficulty achieving the 87% reduction assumed. As with bacteria, the proportion of load from CSO sources is small (as shown in Table 16) and achieving a target % reduction of 80% or even 70% would not appear to be a significant overall difference relative to the magnitude of existing and proposed runoff load. It is also possible that increased load reduction from the point source allocation might be achieved at less cost than nutrient reduction from CSO control. For the estimation of load reductions required for bacteria, the report should consider lumping CSO proposed reductions with point sources so that the utilities can make load trading decisions without "violating" the reduction allocations proposed in the TMDL. [16]

Response:
The TMDL does not drive the LTCPs; however, since the LTCPs are established, the TMDL reflects the results of the studies. It is not the intent of the TMDL to permit or restrict the CSOs to a particular load; it instead reflects the results of the LTCP studies and expected volume and load reductions. The reductions for Akron are based on Akron's proposed treatment technologies including Actiflo®. The expected Actiflo® reductions are based on the literature from the company which designed the Actiflo® system. The WWTP point source load and needed reductions are a lower flow issue than could be addressed by CSOs, so effluent trading is not possible in this instance.

67. Comment:
Page 81, Table 16 - The title should be revised to read "Reduction percentage expected per source category for the Cuyahoga at Independence." The 4th and 7th columns should read % reduction expected. This change is necessary since, based on my review of the document, the percent reduction is what is expected if the LTCPs are implemented, Storm Water Phase 2s are implemented, Planning Area documents are implemented, etc….. Thus, these values are not needed but are values that are expected. [16]

Response:
A footnote has been added to the table to reflect this clarification.

68. Comment:

Page 81, Table 16 - The executive summary states that the "Major sources of impairment include municipal and industrial point sources, combined sewer and sanitary overflows and to a lesser extent natural conditions.". Although, based on my review of Table 16 this statement is totally incorrect and inappropriate; the table clearly shows that the major source of existing load for both fecal and phosphorus is runoff. Please add another column to the table indicating the percent of existing load from each source.

The chart should read:

	Fecal	Phosphorus
Runoff	98.4%	45%
Point Sources	<1%	34.9%
Akron CSO & Bypass	1.5%	7.1%
Septic	<1%	5.9%
Lake Rockwell Release	<1%	4.5%
Groundwater	<1%	2.6%

As identified above, the MAJOR SOURCE is not "municipal and industrial point sources, combined sewer and sanitary overflows". The MAJOR SOURCE is runoff. With this being the case, the TMDL is lacking any proposals to adequately deal with the major runoff problem. [16]

Response:

A "major source" in this language is a source that has a significant effect during the hydrologic condition during which it occurs, NOT an overall percentage of total load. WWTP loads are the major source during low flow. Akron CSOs are a major source locally when they overflow. Adding the percentages as requested would be misleading.

69. Comment:

Page 81, Table 16 - Akron's CSO LTCP is currently in draft form and the expected projects/expected removals are currently under review. Language should be added to specifically state that the expected/needed removals are subject to final negotiations between the City of Akron and regulators. [16]

Response:

Language has been added to the report.

70. Comment:

Page 89, Section 6.1.1.2 and App. J.3.5: The ambiguity noted above highlights a fundamental assumption in this TMDL that appears to be made for the sake of convenience, but which cannot be allowed to become policy. The Draft makes the assumption that the "Rockwell release", i.e., the Upper Cuyahoga flow, exerts an impact on the *lower* Cuyahoga at Independence *more than 45 miles downstream*, even where the Draft acknowledges that the Gorge Dam

ameliorates effects of upstream flow (Draft p. 25). At the same time, the Draft dismisses the impact of a host of Middle Cuyahoga dischargers as merely having "effects locally." (Draft App. J, Section J.3.5). This distinction may have made creating a model easier, but appears to be completely self-contradictory.

More importantly, it is not a credible basis upon which to exempt any Middle Cuyahoga dischargers from complying with the proposed reductions, as appears to be suggested in Section J.3.5. The last two sentences of Section J.3.5. should be deleted. Should any dischargers be required to meet the proposed reductions, all should be required to meet the proposed reductions, including all Middle Cuyahoga dischargers. [16]

Response:
The Upper Cuyahoga load and flow are inputs to the lower Cuyahoga and the effects are seen at Independence, keeping in mind that a substantial loss term has been included to reflect that upstream sources do not act like direct or immediately upstream sources at Independence. The Gorge Dam changes the flow pattern in the system but does not eliminate it. Appendix J does not imply that the middle Cuyahoga dischargers have only local effects nor does it dismiss their impact. This is an inference of the comment author. Section J.3.5 does not discuss the middle Cuyahoga dischargers specifically at all. It only references minor discharges; as most of the Middle Cuyahoga WWTPs have design flows greater than 1 MGD it is unclear what the comment author is referring to with this comment.

71. Comment:
One commenter wished to reserve comment on this TMDL until work proposed in the Tinkers Creek subbasin is complete and until the entity's NPDES permit is available. [4]

Response:
The comment period for this TMDL is provided to allow the public to comment on this work. If the Tinkers Creek work results in a TMDL for that subbasin, then a public notice for comment will be issued for that TMDL. NPDES permits have yet another public comment period.

72. Comment:
One commenter suggested some possible sources of impairment in the Tinkers Creek area. [9]

Response:
The proposed Tinkers Creek work would investigate the situation and evaluate possible solutions. The best solution to the impairment will involve local input, and the comment author is urged to participate as the Tinkers Creek work progresses.

73. Comment:

A commenter pointed out the need for all entities to work together to bring the Cuyahoga River into attainment, including

- local governments adopting wetlands and riparian protection measures
- health departments monitoring and upgrading home septic systems
- counties adopting and/or updating comprehensive land use plans
- Ohio EPA adopting headwater protection measures and coordinating with 208 planning agencies, the RAP, Phase II communities, coastal management efforts.

The commenter urged that the TMDL be "implemented with all deliberate speed" so that the benefits of clean water can be realized in the Cuyahoga basin. [15]

Response:

We agree that local, regional, state, and national cooperation is needed for the goals of the TMDL to be realized. Ohio EPA is working in the suggested areas and others to bring about the needed restoration.