Appendix C: Public Comment Response Summary

The draft Leading Creek Watershed Total Maximum Daily Load report was available for public comment from July 12 through August 13, 2007. This appendix contains the comments received and responses to those comments. Please note that reference to report content from the draft document may not correspond to the same page numbers in the final report.

Comments were submitted by CONSOL Energy, Inc.

Comment #1
CONSOL Energy Inc. suggests that Ohio EPA reevaluate the use of TMDL targets that were derived from Western Appalachian Plateau (WAP) reference site statistics, which may be too restrictive, and which in some cases may be significantly lower than the in-stream aquatic standards found in surrounding states.

The draft TMDL targets for total suspended solids (TSS) and chlorides were derived from WAP ecoregion reference site statistics contained in Ohio EPA's 1999 Technical Bulletin entitled "Association between Nutrients and the Aquatic Biota of Ohio Rivers and Streams." Interestingly, the data in this publication illustrates a number of instances where streams with low Index of Biotic Integrity (IBI) ranges had lower TSS and/or chloride averages than streams of the same relative size and in the same ecoregion with high IBI values. This is noteworthy since it does indicate that the values are not necessarily related to a particular quality of habitat, and their uses as water quality targets seems to be debatable.

Response
Tetra Tech and Ohio EPA used the "Association" targets for TSS and chlorides to be consistent with previous TMDL efforts in Ohio and in the absence of alternative targets. We did acknowledge the potential shortcomings of using TSS as an indicator for sediment impairments in Section 2.3.3 and emphasized the importance of habitat factors in Section 2.3.4. The following table presents other potential TSS and chlorides targets:

Pollutant	WAP 90th	WAP 95th	USEPA (1988)
Chlorides (mg/L)	86.2	112.95	860 (acute) 230 (chronic)
TSS (mg/L)	18.8	34.2	Not Available

Notes: Source of USEPA chlorides targets is USEPA. 1988. Ambient Water Quality Criteria for Chloride – 1988. U.S. Environmental Protection Agency Office of Water. EPA 440/5-88-001. Washington D.C.

For novel situations the use of regional reference data, particularly when paired with ambient biological performance, is preferable to an over reliance on bioassay results. The greatest value of using regional background conditions is the fact that they are local, in physiographic terms. It is not a "one size fits all" approach, derived from an overly simplified assemblage of one or two organisms represented in a traditional dose/response bioassay. Additionally, the regional reference site approach has been applied to other TMDLs and other technical problems Ohio EPA has been called to evaluate and solve, and has been accepted over many years by U.S. EPA and other interested or affected parties.

Given the uncertainty surrounding the use of TSS as proxy for sediment, higher percentiles were used, not median or average values. The 90th or 95th percentile values are coarse thresholds, maximum values associated with WWH performance. The higher associated values recommended here function as reverse safety factors, accounting for real uncertainty by establishing higher allowable concentrations. Furthermore, direct field observations via the QHEI are incorporated into the TMDL regarding sediment.

As chloride is a common and often significant constituent of TDS, using the 90th or 95th percentile regional reference values as described within the TMDL is reasonable. The U.S. EPA acute value (860

mg/l) is consistent with our experience with TDS statewide, namely, loss of WWH attainment around 900-1000 mg/l. Also, toxicity of dissolved ions that make up TDS is complex and not fully understood, but there is evidence that the toxicity of sulfates (a key component of mine-related TDS) is related to chlorides. There may be other unknown interactions with and between other constitutes of TDS to heighten its net toxic effect.

Chloride is essentially a subset of TDS, so macroinvertebrate indicators respond similarly to both (see Figure 1). Mean responses in the number of Ephemeroptera, Plecoptera and Tricoptera (EPT) taxa, which represents sensitive components of the macroinvertebrate community, and in Invertebrate Community Index (ICI) scores, a measure of overall macroinvertebrate community health, are negatively related to the concentration of chloride in data from Ohio EPA's statewide database. ICI scores at sites where the average chloride concentration is greater than the 90th percentile from a subset of statewide data trimmed to exclude sites with either high ammonia concentrations (0.1 mg/l) or low pH (< 6.5) were 5 to 7 points lower on average than sites with chloride values less than the 75th percentile concentration (Figure 2). The mean numbers of EPT taxa at sites exceeding the 90th percentile for chloride were lower than those at sites with chloride values falling between the 75th and 90th percentiles. The 75th and 90th percentiles for chloride in the trimmed dataset are 62 and 108 mg/l, respectively, suggesting that the TMDL target of 86.2 mg/l is not unreasonable.

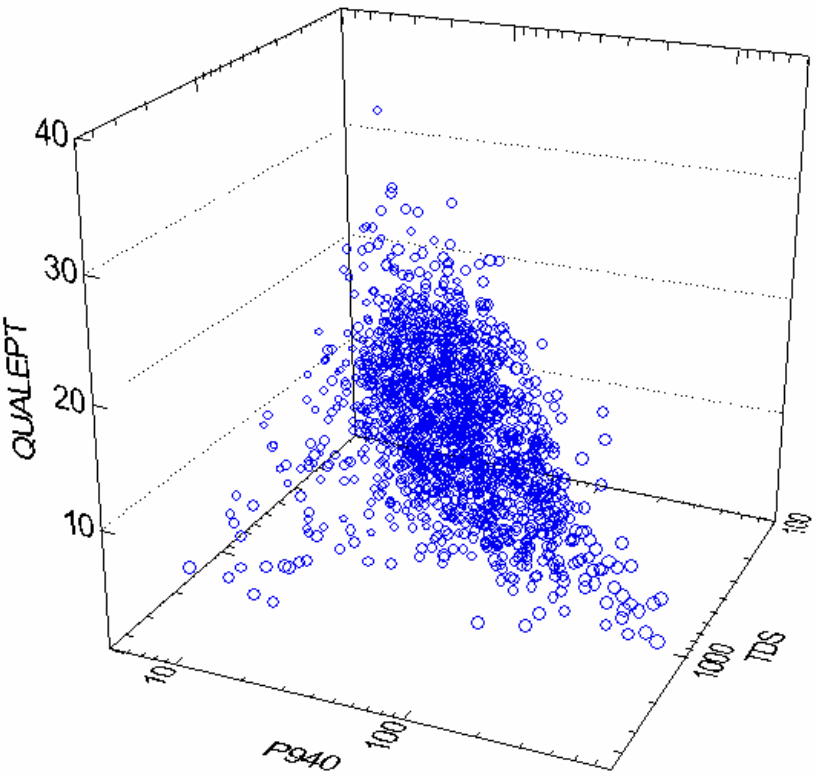

Figure C-1. Number of EPT taxa in relation to chloride (P940) and TDS.
Notice the left hand side of the graph—not all TDS values have chloride as a significant fraction. These data are from the Ohio EPA statewide database and exclude chemistry values where ammonia concentrations equaled or exceeded 0.1 mg/l and pH was less than 6.5.

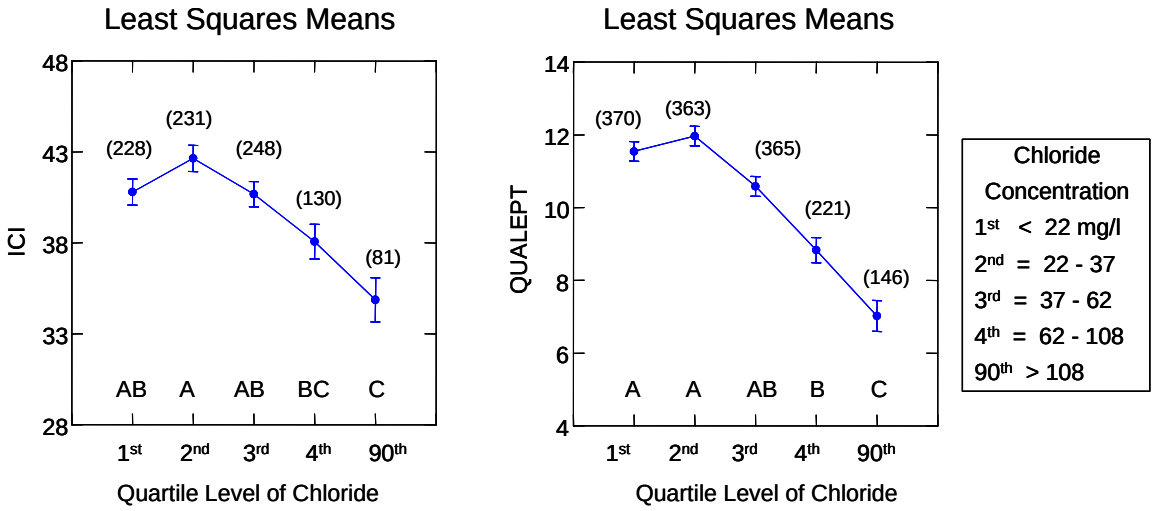

Figure C-2. Results from ANCOVA models where ICI scores and the number of EPT taxa were assigned to quartile levels of chloride.
Sample sizes within each stratum are plotted above each respective mean. Drainage area was used as the covariate. Means with common letters do not differ at the Bonferroni adjusted family level of $P < 0.05$. Data were screened prior to analyses to exclude pH values < 6.5 and NH_3 values > 0.1 mg/l. The result for mean ICI scores suggests that the TMDL target concentration for chloride of 86.2 mg/l is not unreasonable.

Comment #2
The draft TMDL recommends that the Meigs Mine No. 31 Parker Run discharge be restricted to a maximum concentration of 1500 mg/L TDS during low flow conditions. CONSOL suggests an evaluation of flow restriction (of the Parker Run discharge) during low flow periods as biocriteria data presented by Rankin (2005) in a 2004-05 fish and macroinvertebrate study (of Leading Creek) illustrates that sampling points on Leading Creek downstream of the Parker Run discharge score well. The report (page 24-25) summarizes Meigs Mine No. 31 Fish Assemblage Trends for Leading Creek and notes that the fish assemblage has essentially recovered to pre-discharge (to before the 1993 Meigs Mine discharge event) conditions. In addition, higher fish biomass results are reported for the 2004-05 study as compared to the pre-1993 discharge conditions. Another noteworthy item presented in this report is Table 2 (page 17) which presents the association between narrative macroinvertebrate ratings and Ohio aquatic life use attainment in the Interior Plateau (IP) region which shows a significant difference with respect to Invertebrate Community Index (ICI) scores that achieve Warmwater Habitat. Possibly, this indicates the Ohio Warmwater Habitat water quality criteria may be too restrictive.

CONSOL has been forthright in communicating with the Ohio EPA regarding future plans for the Meigs Mine No. 31 discharge and has acknowledged that future discharges from Meigs Mine No. 31 will continue to have elevated TDS for some time. This has included discussions regarding the elevated TDS levels and the need for a site-specific evaluation via a carefully conceived monitoring approach that includes chemical, toxicological and biological metrics. The 2005 Leading Creek Watershed Management Plan proposes to work with CONSOL and the Ohio EPA to determine a long-term plan for the Meigs Mine discharge and to possibly research (during years six through nine) how elevated TDS

concentrations may affect biological communities. CONSOL concurs with this approach and would likely be a willing partner in these efforts.

Response

In researching this response and reexamining the Rankin (2005) report, Ohio EPA discovered two errors in the report.

First, in the attainment table (MBI Table 3), the third Leading Creek site downstream from Parker Run (Langsville) is in partial attainment, not full attainment as the table indicates. The ICI score as indicated is 30 and is marked as a significant departure, which means partial, not full, attainment at that site.

Second, Table 2 in the Rankin document is erroneous in that the narrative ranges are given for the Interior Plateau (IP) ecoregion of Ohio, not the Western Allegheny Plateau (WAP) ecoregion in which Leading Creek resides. The IP ecoregion covers a small area of far south-central and southwestern Ohio. The appropriate table for the WAP ecoregion would be as follows.

Excellent (E) – Achieves EWH (ICI ≥ 46)
Very Good (VG) – Insignificant departure from EWH (ICI 42-44)
Good (G) – Achieves WWH (ICI ≥ 36)
Marginally Good (MG) – Insignificant departure from WWH (ICI 32-34)
High Fair (HF) – Achieves MWH-Mine Drainage (ICI ≥ 30)
High Fair (HF) – Achieves MWH-Channel Modified (ICI ≥ 22)
Low Fair (F) to Poor (P) – Fails all biocriteria (ICI 8-20
Very Poor (VP) – Fails all biocriteria (ICI ≤ 6)

The suggestion that Ohio's biological standards are too stringent is without merit. Warmwater habitat (WWH) was derived from the 25th percentile of community performance from Ohio's regional reference sites (categorized by ecoregion and stream size). Stated another way, WWH represents the sub-failing (25th percentile) streams within the reference population. Furthermore, literally hundreds of impaired stream miles throughout the state have been recovered to WWH, and even EWH, over the past 20 years. This fact alone points to the reasonableness and achievability of streams so designated.

The Leading Creek Watershed Management Plan (LCWMP) does include the statement about working with CONSOL and Ohio EPA "...to determine the specifics of the NPDES permit and the long-term plan for the discharge" (see page 157 of the LCWMP). It appears to suggest that this should be done in Year 1; based on the document date this should be 2006. The LCWMP also includes another task—"Research how elevated TDS concentrations may affect biological communities"—and suggests that this should be done in Years 6-9. Thus, the LCWMP recommends development of a long-term plan immediately (not in 6 to 9 years), with consideration of possible research later on in Years 6-9. The comment suggests a 6- to 9-year timeframe for all of this, but such a timeframe doesn't appear to be consistent with the Plan's intention.

Ohio EPA has engaged in a long conversation with the comment writer about the situation that resulted when SOCCo pumped a billion gallons of extremely cold and low pH water into Parker Run, killing almost all aquatic life. After the initial event, a benchmark document laid out requirements that all endpoints be met (in Leading Creek and Parker Run); all parties agreed and there is no need to reevaluate the endpoints.

We are confused by CONSOL's offer "to possibly research how elevated TDS concentrations may affect biological communities." Well over a year ago CONSOL appeared amenable to doing the necessary

research to explore the complex toxicity of their effluent, but they backed away from that proposal, claiming it was "academic."

Comment #3
The report effectively details how flows in Leading Creek and its tributaries are extrapolated from an adjacent, comparable watershed. To compensate for the fact that the adjacent watershed does not have a pumped discharge comparable to our Southern Ohio Coal Company's Meigs Mine No. 31 (Parker Run) discharge, the report arbitrarily assumes that the Parker Run facility discharges continuously at its maximum permitted rate of approximately 5000 gpm. As such, it appears that the 5000 gpm is included in the extrapolated flows for sample, points on the main stem of Leading Creek, downstream of its confluence with Parker Run. This does not appear to be effectively explained in the text.

Response
Loadings are based on a design flow of 7.5 MGD of treated mine water into Parker Run. The WLA for the facility therefore had to be based on this flow volume (regardless of whether it has historically discharged at this rate or not). The estimates of downstream flows therefore had to also reflect this discharge rate, or the WLA would have greatly exceeded the loading capacity of the stream. This is the reason the 7.5 MGD was added to the extrapolated stream flows calculated for Parker Run (Station # TM07) and the stations along the mainstem of Leading Creek located downstream of its confluence with Parker Run (Stations LCMS03, LSMS02, and LCMS01). Additional text will be added to the final report to clarify this in **Section 3.2.**

No gage is located on Leading Creek. Through continual talks with SOCCo since the pumping began in 1993, Ohio EPA and SOCCo have agreed that the Shade River would be used as a comparable watershed. Meigs #31 Mine AMD WWTP (design flow of 7.5 MGD) will not always discharge the 7.5 MGD, but this WWTP/mine complex is designed to allow the mine pool to fill during rain events and be pumped out later during dryer periods to keep the mine pool below the lowest surface elevation. This will allow for the mine to be used as an equalization tank. Therefore, while #31 will not always be pumping at design levels, it will be pumping at higher rates (design) during periods when there is far less dilution in Parker Run.

Comment #4
In addition, elsewhere in the draft, it is noted that the average discharge rate for Parker Run has been 2.2 million gallons per day (1527 gpm). The report is not clear whether the time interval referred to for this observed flow rate includes the recent period when the Meigs Mine complex has been flooding, which would significantly affect the average discharge rate. CONSOL has projected the time average discharge from a proposed hydrated lime treatment facility at Parker Run to be approximately 4220 gpm.

Response
The average discharge rate of 2.2 MGD is the average discharge of the Meigs #31 Mine, not Parker Run. This value was derived from the facility's Monthly Operating Reports (MOR) that include discharge data from 1/1/1995 through 10/31/2006. **Page 55, paragraph 2, sentence 4** of the report explains how this value was derived. No loads or other statistics were calculated using this value, it is just provided to give an understanding of the average discharge over the past 12 years of operation.

The draft asserts that, overall, the agreement between measured and extrapolated flows is good with R-squared values for the straight line fits averaging over 0.90. However, the flow data presented in the report for the main stem of Leading Creek (the data from Figure B-5 of the Appendix) indicates only two flow measures were made on Leading Creek (at location LCMS03 - a point downstream of the Parker Run confluence) and that the measured flow was significantly lower than the extrapolated flow on both

occasions (measured flow was approximately 25% lower than extrapolated flow on a high flow day and approximately 70% lower on a low flow day).

Response
We acknowledge that there is uncertainty associated with estimating flows in ungaged watersheds. However, use of the drainage area ratio approach employed for the Leading Creek TMDL is a U.S. EPA-accepted practice (U.S. EPA, 2007) and provided reasonable results for several of the locations with available flow data. One purpose of this approach is to ensure that sampled water quality data are appropriately paired with the corresponding flow condition; the drainage area ratio is usually very accurate in this regard. Another purpose of the approach is to estimate the magnitude of the daily flows as closely as possible, which is more difficult. It is acknowledged that flows at LCMS03 might be overestimated; however, we did not feel the very limited observed flow data justified revising all of the flow estimates. Had we done so, the loading capacity of the stream would have been reduced, which would have resulted in potentially larger than necessary source load reductions.

Comment #6 (including 3 paragraph summary)
CONSOL acquired the Southern Ohio coal Company (SOCCO) operations from American Electric Power in July 2001. SOCCO operations include the Meigs Mine No. 2, Meigs Mine No. 31, and Raccoon (underground) mines. Active mining operations at Meigs Mine No. 2 and Meigs Mine No. 31 were subsequently closed in early 2002. The Raccoon Mine was closed prior to CONSOL's acquisition of SOCCO.

Following mine closure, the pumping of water from both Meigs Mine No. 2 and Meigs Mine No. 31 was essentially discontinued, and both mines are currently flooding as groundwater recharge continues. CONSOL has evaluated the effects of water accumulation in each mine and the potential for mine water discharge to the surface drainage system. Those evaluations have concluded that without pumping and subsequent treatment of water from the mines, surface water discharges from both mines are possible and ground water could also potentially be affected.

CONSOL is currently securing permits (from Ohio EPA, U.S. Army Corps of Engineers and Ohio Department of Natural Resources) in order to facilitate post-closure water handling and treatment for these facilities. The approval and construction of these facilities will allow for the transfer, treatment and discharge of all waters from the aforementioned mines at one location (Meigs Mine No. 31). With the exception of storm water drainage during reclamation, this will essentially eliminate discharges from the Meigs Mine No. 2 to Ogden Run (and Leading Creek below its confluence with Ogden Run). As such, CONSOL considers the proposed water handling and treatment approach to be the most protective of local ground and surface water resources, and certainly for the overall Leading Creek watershed.

The above comments serve to highlight some of the more obvious issues of this draft. Ohio EPA should not adopt the draft without a more robust analysis of not only the potential costs of these rules, but also the science and policy decisions underlying them. To adopt them without significantly more consideration of their costs and the validity of the science underlying them may not be in the best interests of Ohio. CONSOL urges the Ohio EPA to permit more study and independent review before the agency finalizes the load restrictions presented in this document. Specifically, this should include a peer-reviewed evaluation of adopting criteria for Leading Creek from surveys of reference sites in the WAP ecoregion rather than from toxicity data.

Response
Ohio EPA has engaged in long consultation with the commenter about these topics. As noted elsewhere in these responses, apparent agreements have subsequently fallen through, cited as "academic."

Regarding the TDS criteria specifically, Ohio EPA has reviewed the criteria recommended in the draft TMDL report (on April 15, 1991 and June 22, 1993). Independent and/or peer review would likely result in more stringent criteria than those already recommended based on biological and toxicological data.

Comment #7
Because biological integrity is affected by many factors, as discussed in the draft TMDL for Leading Creek, controlling chemicals alone does not assure protection or restoration. TDS is often used as surrogate measures of the collective concentration of the common ions in fresh water (i.e., sodium, chloride, calcium, magnesium, potassium, bicarbonate, sulfate and bromide). As the Society of Environmental Toxicology and Chemistry (2004) notes, the correlation between increasing TDS and toxicity is not always caused by the same ions and, therefore, is not the best predictor of toxicity due to an effluent.

Response
As a measure TDS is complex, possibly comprised of any number of different ionic constituents. Together with CONSOL's technical staff, Ohio EPA tentatively agreed to explore this complexity, with the express aim of offering a variance if we could strip the TDS load of its toxic effect(s) or at least reduce the toxic effects to those associated with ~1000 mg/l. Unfortunately, CONSOL quickly abandoned the idea. As such, we are left with the 1500 mg/l maximum criterion listed in the Ohio WQS.

Comment #8
Water quality standards must not only meet the requirements of the Clean Water Act, but also strike a balance between a number of often competing societal interests. Too restrictive loading reductions could place sections of the counties located within the Leading Creek watershed area at a distinct competitive disadvantage with respect to attracting new investments in mining, industry or agriculture.

Response
The TDS limit/mining relationship is strictly site-specific. Ohio EPA is unaware of any other mine that has a TDS monitoring requirement or limit. Should other underground mines become inundated with water and pumped to the surface with a result of high TDS, Ohio EPA would work with the permittee as we have with SOCCo.

The Leading Creek watershed area has been significantly damaged by historic mining impacts that are a concern for both the health and safety of the local residents as well as devastating for the aquatic life that inhabit these streams. Since the mid-1980s, the Ohio Department of Natural Resources Division of Mineral Resource Management has spent approximately $5.6 million to reclaim nearly 800 acres of abandoned mine lands in the watershed. More than $1 million have also been spent to stabilize landslides, close hazardous portals, and address acid mine seepage issues at residences. Based on the recommendation in the Leading Creek Acid Mine Drainage Abatement and Treatment (AMDAT) plan, the total cost estimate for remediation of the selected major unreclaimed AMD sites in the watershed is approximately $1,850,000 and will cost an additional $2,560,000 for operation and maintenance over a 10-year period. While we do consider the social and economic justifications for allowing discharges to waters of the state, we also need to take into consideration the amount of money that the state has spent to restore the Leading Creek watershed and ensure that the watershed is not further damaged.

Ohio EPA continues to monitor the water quality condition of the Leading Creek watershed. During 2007, five sets of samples were collected at 15 locations in the watershed. A summary of the results of this sampling is included in Appendix D.

References

U.S. EPA. 1988. Ambient Water Quality Criteria for Chloride – 1988. U.S. Environmental Protection Agency Office of Water. EPA 440/5-88-001. Washington D.C.

U.S. EPA. 2007. An Approach for Using Load Duration Curves in the Development of TMDLs. EPA 841-B-07-006. August 2007. U.S. Environmental Protection Agency. Watershed Branch (4503T). Office of Wetlands, Oceans and Watersheds.

Rankin, E.T. 2005. Fish and Macroinvertebrate Study of Leading Creek. 2004 Field Year. Midwest Biodiversity Institute. Columbus, Ohio.