Comment Response Document
Regarding the Total Maximum Daily Load of Polychlorinated Biphenyls in the Gunpowder River and Bird River Subsegments of the Gunpowder River Oligohaline Segment, Baltimore County and Harford County, Maryland

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Load (TMDL) of Polychlorinated Biphenyls (PCBs) in the Gunpowder River and Bird River Watershed. The public comment period was open from August 20, 2015 through September 18, 2015. MDE received three sets of written comments from Mr. Thomas Weissinger, Environmental Director of Raven Power; from Mr. Theoux M. Le Gardeur, RIVERKEEPER Gunpowder River; and from Mr. Steve Stewart, Director, Baltimore County Dept. of Environmental Protection & Sustainability.

Below is a list of the commentors, their affiliations, the date comments were submitted, and the number referenced to the comments. In the pages that follow, comments are summarized along with MDE's responses.

Author	Affiliation	Date	Comment Number
Mr. Thomas Weissinger	**Raven Power**	**9/18/2015**	**1**
Mr. Theoux M. Le Gardeur	**Gunpowder RIVERKEEPER**	**9/18/2015**	**2 - 8**
Mr. Steve Stewart	**Baltimore County Dept. Environmental Protection & Sustainability**	**9/22/2015**	**9 - 13**

Comments and Responses

Comment 1

The commentor feels it is important to emphasize MDE's findings, noted on pages 33 and 36, that the estimated tPCB load transferred via the C.P. Crane's non-contact cooling water reduces as PCB concentrations in the Bay waters decline, and that the amount transferred will ultimately be reduced by 96% when the TMDL is achieved.

Response: MDE thanks the commentor for their input.

Comment 2

The commentor asserts that the TMDL established in this document is based on "limited science," and that the data in the TMDL are insufficient for determining that "all potential sources of PCBs are included in the TMDL," for "determining needed pollutant load reductions from pollutant loads being addressed," or for establishing "the most effective controls necessary to address impairments." This conclusion is supported by the following specific claims: (1) the data do not account for legacy inputs from APG Edgewood; (2) there is not adequate air quality

monitoring to characterize inputs from "reclamation centers"; and (3) the water quality monitoring does not fully characterize inputs from landfills. Based on these assertions, the commentor concludes that it is premature for MDE to submit the TMDL report to EPA and recommends that MDE provide, "more science to better characterize the waterbodies."

Response: The monitoring plan for the Gunpowder River and the Bird River was designed to estimate PCB loads from the watersheds, to develop PCB TMDL endpoints for the water column and sediments, to characterize water quality within the tidal systems, and to calibrate the water quality model. The monitoring data is sufficient to support TMDL development and is similar in scope to monitoring conducted in previous EPA-approved TMDLs. The monitoring plan was not designed to determine "the most effective controls necessary to address impairments." Determining the effectiveness of controls falls outside the scope of the TMDL, but could be accomplished through implementation.

MDE reviewed all available documentation from the Land Management Administration's (LMA's) records on the APG Edgewood contaminated site and identified no legacy PCB contamination in areas of this facility draining to the Gunpowder River. Therefore a PCB loading was not assigned specifically to this facility.

While air quality monitoring was not conducted to specifically characterize inputs from reclamation centers, a PCB load from atmospheric deposition to the surface waters of the Bird River and Gunpowder River was estimated for this TMDL. This load should implicitly account for all typical atmospheric sources within the watershed, including reclamation centers.

While water quality monitoring was not conducted to characterize inputs from specific landfills, PCB monitoring was conducted in several non-tidal streams in order to estimate PCB loadings from the watershed. Sources within the watershed, including any landfills draining to the monitoring stations, are implicitly accounted for within this load. Unless there is sufficient reason to suspect high PCB loads from a specific landfill, there is no need to collect data specifically for landfills. Landfills are not generally recognized as significant sources of PCBs as groundwater is not a major pathway for PCB transport because PCBs have low solubility and bind to organic matter in soils.

MDE believes that the data used in this report are sufficient for characterizing the system in support of TMDL development and does not see an adequate reason for delaying submittal of this TMDL.

Comment 3

With regard to implementation of this TMDL, the commentor states that the report does not provide a "specific monitoring plan" to assure that progress is being made toward meeting Water Quality Standards. The TMDL report should provide, "specific language related to future monitoring protocols," and establish, "[a]ssurance of compliance with the TMDL."

Response: As stated by the commentor, this TMDL does not provide a monitoring plan to assure progress toward meeting water quality standards. This task relates to implementation, and falls outside the scope of a TMDL. The TMDL does include an "Assurance of Implementation" section which provides general information and guidance on how reductions in PCBs can be achieved.

Comment 4

The commentor asserts that the TMDL report should present information about, "past compliance of NPDES permits to determine present compliance" and should establish, "[t]echnology-based effluent limitations on toxic pollutants from the C.P. Crane Facility."

Response: There are currently no PCB effluent limitations or requirements for any NPDES permittees within the Gunpowder or Bird River watershed including the C.P. Crane facility. PCB compliance data was therefore not applicable to any facility, past or present.

Regarding C. P. Crane, this TMDL does not establish a PCB effluent limit because it was determined that this would not be an effective way to reduce PCB concentrations in the Gunpowder River. First, it is important to recognize that the PCBs discharged from the facility are not created by the facility, but are instead being conveyed from one tidal water body to another. At a Bay-wide scale, C. P. Crane is not a source of PCBs, but a conveyance. This does not relieve the facility of responsibility for the discharge, but it does mean that extra consideration needs to be taken before assigning an effluent limit.

If an effluent limit were assigned and enforced, there would likely be two potential mechanisms for achieving the limits. The first would be to treat the effluent. Given the high flows (259 MGD or 400 cfs) from the facility and relatively low PCB concentrations (0.28 to 0.56 ng/L), this would likely be impractical. The other, more likely way to achieve the effluent limit would be to eliminate the discharge into Saltpeter Creek. A model scenario, with zero discharge attributed to C. P. Crane, was run to predict the impact of this change. The scenario results indicated that the TMDL endpoint would not be achieved any earlier when the flow is eliminated, than it would with the flow maintained at 259 MGD.

The lack of impact from this action is a function of the river's hydrodynamics. Despite the fact that eliminating the C. P. Crane would remove a large (155 g/year) loading from the Gunpowder River, its PCB impact would be severely attenuated by the corresponding decrease in flow from the estuary. As currently modeled, the PCB loads at the mouth of the Gunpowder River are driven largely by flow out of the Gunpowder River (Peclet number, Pe = 7) rather than by tidal dispersion. With the facility discharge removed, the tidal impact would increase (Pe = 0.25), resulting in larger loads being transmitted into the mouth of the river via tidal dispersion. The conclusion drawn in this TMDL report, and in PCB TMDL reports for many nearby estuaries, is that the impairment of tidal tributaries in the upper Chesapeake Bay is being driven by concentrations of PCBs in the mainstem of the Bay. In fact, the 49-year time period for meeting this TMDL is consistent with the timelines established in similar nearby estuaries—43 years for the Magothy River, 46 years for the Severn River and 38 years for the Sassafras River. In all of these systems, including the

Gunpowder River, a reduction in Bay concentrations will be the key mechanism for achieving water quality endpoints.

Comment 5

The commentor states that, "a strong spatial relationship exists between PCB concentrations in sediment and fish." The commentor continues, stating, "[i]t appears that a complete exposure exists from sediment to fish and that high concentrations in fish tissues are a direct result of exposure to contaminated sediments in these waterways."

Response: MDE agrees with this statement. Since sediment PCB concentrations can result in bioaccumulation in the food chain, and since concentrations in the sediment are driven by watershed and Bay inputs, controlling the sediment and fish tissue concentrations will be a function of reducing the inputs from the watershed and the Chesapeake Bay.

Comment 6

The commentor asserts that the TMDL does not provide a rigorous scientific or economic analysis of dredging PCB-laden sediments and its effect on achievement of Water Quality Standards. The commentor further states that the TMDL report should provide "an economic justification" of "more expedient methods of PCB reductions, like dredging," since it could bring about meaningful PCB reductions in a reasonable timeframe.

Response: This analysis was not included in the document as detailed analyses of implementation strategies are outside the scope of this report.

Comment 7

The commentor states that the TMDL report does not provide information about where Fish Consumption Advisories will be posted.

Response: In response to this comment, a link to the MDE Fish Consumption Advisory webpage, mde.maryland.gov/fishadvisory, has been included in the TMDL report.

Comment 8

The commentor asserts that the TMDL fails to establish "robust public participation", and requests that a public hearing be held on these draft documents, prior to submission to EPA, to address all of the commentor's concerns.

Response: MDE believes that a strong public participation process leads to a more robust TMDL report. MDE has a well-defined process for soliciting feedback early and often throughout the development process. MDE's TMDL webpage lists the following "Public Education and Participation" activities which are completed during the development process for each TMDL.

- Once work on a specific TMDL begins, local governments, identified interested parties, and appropriate dischargers in that watershed will be consulted during key stages of development.
- Introductory TMDL briefings may be provided upon request. A second round of more in-depth briefings will be provided to those who request more detail.
- After a draft TMDL has been developed, a formal public notice and comment period will be provided prior to the TMDL's submission to EPA.

In accordance with these procedures, an initial request for data relating to this TMDL was issued by MDE in March 2012, followed by a Notice of Intent in March 2015. On August 20, 2015, a draft copy of the Gunpowder River PCBs TMDL report was released for a 30-day public comment period, running through September 18, 2015. Each of these marked an opportunity where stakeholders were notified and could request to meet with MDE staff regarding the development of this TMDL.

At the request of a stakeholder, a public meeting was held to discuss the TMDL on the morning of September 3, 2015. Individual invitations were sent to MDE stakeholders and a notification was printed in the Baltimore Sun for the public at large.

Throughout this process, MDE has actively reached out to TMDL stakeholders to address their concerns in advance of the submission of this report to EPA. MDE does not believe that there is sufficient reason to delay the submission of this TMDL.

Comment 9

The commentor asserts that it is not clear why the aquatic life salt water criterion is used in lieu of the aquatic life fresh water criterion. Both have only chronic criteria listed, but the fresh water criterion (at 0.014 µg/L) is more restrictive than the salt water criterion (0.03 µg/L). Oligohaline waters have a salinity range of 0.5 to 5 parts per thousand, which is closer to fresh water than salt water. Since the target water column end point is based on the Human Health Criterion of 0.64 ng/L which is below either of the aquatic life criteria, the final TMDL endpoint for water column concentrations will be protective of aquatic life regardless of the whether fresh or salt water criterion are used.

Response: The commentor is correct. The entire "Gunpowder River Area" is defined in COMAR as fresh water, and the fresh water criterion should apply. The TMDL report has been adjusted accordingly. This revision does not affect the conclusion of the TMDL report.

Comment 10

The commentor asserts that while the contribution of PCBs from the Little Gunpowder Falls and the Lower Gunpowder Falls are relatively small, the point sources within those two watersheds have also been assessed. There are two WWTPs (Joppatowne and Richlyn Manor) located in these watersheds. This would negate the assertion that there are no municipal wastewater treatment plants in the watersheds.

Response: This TMDL defines the direct drainage watersheds as the MD 8-Digit watersheds 02130801, for the Gunpowder River, and 02130803, for the Bird River. Loads from Little Gunpowder Falls (02130804) and the Lower Gunpowder Falls (02010802) are defined as upstream loads in this modeling framework. Loads from point sources that discharge into either of these two upstream watersheds, as is the case with Joppatowne WWTP and Richlyn Manor WWTP, are implicitly included in the upstream loading estimates from Gunpowder Falls and Little Gunpowder Falls. The statement that no WWTPs are included in either watershed, refers to the direct drainage watersheds, 02130801 and 02130803. There are multiple WWTPs that discharge to the upstream watersheds, and the impacts of these point sources are included implicitly in this TMDL.

Comment 11

The commentor states that the TMDL has a 70% PCB load reduction from direct atmospheric deposition to the tidal waters for the Bird River, but no load reduction from the same source for the Gunpowder River. Given the geographic proximity of these two waterbodies, it is unlikely that there would be a 70% reduction from one and not the other. This would potentially change the time calculations for meeting the TMDL endpoints in the Gunpowder River and given the Gunpowder River influence on the Bird River might also shorten the time to meet the Bird River end points.

Response: The Gunpowder River and Bird River TMDLs are two separate TMDLs with different TMDL endpoints and different model scenarios. The decision to handle the two rivers separately was based on how the rivers were originally assessed and listed as impaired. Fish tissue collected in the Gunpowder River was used to list only the tidal waters of the 8-digit Gunpowder River watershed (02130801) and tissue from the Bird River was used to list the tidal waters of the 8-digit Bird River watershed (02130803). The fish tissue analyses resulted in the Gunpowder River being listed in 2006 and the Bird River being listed in 2008.

Since the TMDLs are based upon different endpoints and scenarios, the conditions required for attaining the two TMDLs need to be considered independently. For the Gunpowder River it was determined through modeling that PCB reductions in the Gunpowder River and Bird River watersheds would not significantly impact the amount of time needed to achieve the TMDL. In the Bird River, reductions were not assigned to downstream sources with the exception of the 6.5% annual decrease from the Chesapeake Bay mainstem. See sections 5.4.1 and 5.4.2 for details about the calculated reductions.

Comment 12

The commentor states that for the upper Chesapeake Bay it has been found that the PCB concentrations have been decreasing at a rate of 6.5% per year. The commentor asks whether MDE has run a model where they applied a 6.5% reduction to the concentrations in the Bird River and Gunpowder River subsegments. While there has been no specific study on the PCB concentration trends in the Bird or Gunpowder Rivers, it is not unreasonable to anticipate that there is a similar annual reduction in the concentration. The specific reasons for the decrease in

the upper Chesapeake Bay were not sufficiently detailed in the TMDL document. The commentor suggests that literature would support the argument that there has been a decrease in air concentrations in various parts of the world.

Response: It is expected that there will be reductions to PCB loads from sources in the watershed in time with natural attenuation. This trend would be expected to apply to loads from air deposition as well. However, MDE is not familiar with any data or study that could be used to support the same tPCB declining rate in the Bird River and Gunpowder River as in the upper Chesapeake Bay. If it is determined that there is sufficient evidence to support significant natural attenuation of PCBs originating in the watershed, this could be cited and quantified in an implementation plan.

Comment 13

The commentor states that in the Assurance of Implementation, MDE discussed dredging of PCB contaminated sediments as a mechanism to achieve the water quality standards faster than the projected 49 and 93 years for the Gunpowder River and Bird River, respectively. MDE then pointed out the hazards of dredging and discounted its use as a remediation mechanism. However, dredging does occur for recreational use of the waters and can provide some relief in the length of time that it will take to meet the water quality standards. In addition, there are other remediation mechanisms that can immobilize the PCBs within the sediment and make them biologically unavailable, such as, treatment with activated carbon. NASA has a new "*in situ*" technology for removing PCBs from sediments that could be explored.

Response: Given the potential for damage to the health and habitat of existing benthic communities from dredging and the ongoing sources of PCBs from outside the watershed, this study did not recommend dredging the contaminated sediment as a good strategy for addressing the PCB impairment. In TMDL implementation, a balancing of efficiencies and costs and the possibility of unintended consequences all have to be considered. However, if dredging is occurring in the watershed to address other concerns, such as recreational access, MDE encourages those developing implementation plans to quantify the impacts of these actions. Furthermore, if new technologies are developed to make the removal of PCBs from sediment more feasible, these would warrant further investigation. One process that has been piloted in Maryland is an "in situ" treatment technology, known as 'SediMite', that sequesters PCBs using an activated carbon sediment amendment. This technology has been implemented in pilot studies for contaminated sediments in Aberdeen Proving Ground and Dark Head Cove in Middle River.