

## APPENDIX J

### I. STATE PROJECTS

A. Under Paragraph 23 of the Consent Decree, the City of Memphis (“Memphis”) has agreed to pay one half of the civil penalty in State Projects approved by the State of Tennessee. As such, the total amount to be allocated toward State Projects is \$645,000 hereinafter referred to as the “State Project Funds.”

B. Memphis shall implement State Project A – Color Study in accordance with the approved Scope of Work and shall implement State Project B – Geographical Information System (GIS) for Memphis’ sewer collection system in accordance with the requirements and schedule set forth herein.

C. Part II (State Project A - Color Study) and Part III (State Project B – GIS), below, set forth provisions pertaining to the two State Projects. Memphis shall fund the State Projects for a total funding of \$645,000. The priority State Project for Memphis to undertake under this Consent Decree is State Project A - Color Study. Memphis shall provide an initial funding of \$200,000 as provided in Section II.B, below and shall provide such additional funding as necessary to implement the approved work plan up to a maximum of \$400,000. All funds remaining from the total State Project Funds of \$645,000 shall be used for the State Project B – GIS. Should Memphis implement the approved scope of work and undertake State Project A - Color Study for less than \$200,000, the remaining funds shall be used for the State Project B – GIS.

D. Memphis may use contractors or consultants in planning and implementing the State Project.

E. With regard to each State Project, Memphis certifies the truth and accuracy of each of the following:

a. That the cost information range for State Project A - Color Study provided to TDEC in connection with TDEC’s approval of the State Project is a good faith estimate of the cost to implement the State Project.

b. That, as of the date of executing this Decree, Memphis is not required to perform or develop the State Project by any federal, state, or local law or regulation and is not required to perform or develop the State Project by agreement, grant, or as injunctive relief awarded in any other action in any forum.

c. That Memphis has not received and will not receive credit for the State Project in any other enforcement action.

d. That Memphis will not receive any reimbursement for any portion of the State Project from any other person.

F. During the time Memphis conducts the Color Study, it shall submit to TDEC a quarterly report describing the status of Memphis' compliance or non-compliance with the Scope of Work and, if applicable, the reasons for non-compliance. TDEC shall give a reasonable period of time to correct any deficiencies or non-compliance. A few examples of deficiencies and non-compliance are (but not limited to): failure to conduct the Color Study in accordance with the Scope of Work; failure to fully consider the factors which can impact perceptions of "objectionable color" as set forth in II.B; and failure to conduct the Color Study in accordance with the agreed upon Methodology. Memphis shall submit quarterly reports beginning thirty (30) Days after the first full three month period following the Effective Date, and thirty (30) Days after each subsequent three month period thereafter until final approval of the Color Study by TDEC.

G. a. Failure to comply with the deadlines set forth herein Appendix J may result in the assessment of stipulated penalties under Section IX.34(d) (Stipulated Penalties). For purposes of State Project A – Color Study, a violation is limited to a failure to meet in a timely manner the requirements set forth in the Schedule (II.C) for Nos. 1, 3, and 5 and failure to submit the quarterly reports in a timely manner. For State Project B – GIS, a violation is limited to a failure to meet in a timely manner the requirements set forth in the Schedule (III.C) for No. 2.

b. Notwithstanding paragraph I.G.a, above, Memphis shall not be subject to a stipulated penalty under Section IX.34(d) for failure to timely meet the requirements set forth in the State Project A – Color Study Schedule (II.C) for Nos. 1 and 3 if Memphis finalizes the study and submits it to TDEC within thirty-one (31) months after the Effective Date of the Consent Decree. If TDEC approval takes more than thirty (30) days, the thirty-one month period shall be tolled during such time. Stipulated penalties shall not be assessed, if any, until such time as Memphis finalizes the study and submits it to TDEC. Based on the underlying circumstances involving the complexity of a color study, the State and Memphis may agree to such additional time as they deem appropriate.

H. State Project Completion Reports. In accordance with the schedule set forth herein for each State Project or within thirty (30) Days after the date set for completion of the State Project, Memphis shall submit a State Project Completion Report to TDEC for review and comment. Memphis shall provide a courtesy copy to the Environmental Protection Agency ("EPA") and to the Tennessee Clean Water Network for informational purposes. The State Project Completion Report shall contain all of the following information:

- a. A detailed description of the State Project as implemented.
- b. A description of any problems encountered in completing the State Project and the solutions thereto.
- c. An itemized list of all eligible State Project costs expended.
- d. Certification that the State Project has been fully implemented pursuant to the provisions of this Decree.

e. A description of the environmental benefits resulting from implementation of the State Project.

I. TDEC may require the submission of such plans, specifications, technical reports, and other information as deemed necessary to carry out the provisions of the Tennessee Water Quality Control Act (Act) or to carry out the rules and regulations adopted pursuant to such Act; in addition to that described in the preceding Paragraph, in order to evaluate Memphis' State Project Completion Report.

J. Within sixty (60) days after receiving the State Project Completion Report for Project A – Color Study, TDEC shall notify Memphis whether or not Memphis has completed the State Project A – Color Study in accordance with the approved scope of work. Within sixty (60) days after receiving the State Project Completion Report for Project B – GIS, TDEC shall notify Memphis whether or not Memphis has completed the State Project B - GIS in accordance with the requirements and schedule set forth herein. If the time for completion of State Projects A and B has passed (and an extension of time is not provided), and Memphis has not spent at least \$645,000 on State Projects A and B in accordance with this Appendix J, Memphis shall pay the difference between \$645,000 and the actual amount spent on the State Projects within sixty (60) days of TDEC's written request. If Memphis fails to make such payment by check, payable to the "State of Tennessee", within sixty (60) days of such request, stipulated penalties may be assessed under Section IX.34(d) (Stipulated Penalties) of this Consent Decree for each day after the sixty (60) day period that such payment is late.

K. Notwithstanding any provision to the contrary, TDEC and Memphis may agree to provide Memphis additional time to complete State Project A and/or B.

L. TDEC and Memphis recognize that Memphis' decision on disinfection could make the potential need to further control color unnecessary. Notwithstanding any provision to the contrary, TDEC and Memphis may agree at any time that Memphis need not complete the color study as provided in this Appendix. In such case, the Part II (State Project A: Color Study) requirements and any associated stipulated penalties shall no longer apply and any unused State Project Funds shall be used for State Project B – GIS (thereby resulting in State Project B being funded by the amount of \$645,000 minus the amount spent on State Project A – Color Study).

M. Disputes concerning satisfactory performance of the State Project and the amount of eligible State Project costs may be resolved under Section XI (Dispute Resolution) of this Decree.

N. Each submission required under this Section shall be signed by an official with knowledge of the State Project and shall bear the certification language set forth in Paragraph 20.

O. Memphis shall include the following language: "This project was undertaken in connection with the settlement of a civil enforcement action, United States et al. v. City of Memphis, taken on behalf of the Tennessee Department of Environment and Conservation under the Tennessee Water Quality Control Act." when submitting the final State Project Completion Report for each State Project to TDEC.

## II. STATE PROJECT A: COLOR STUDY

### A. Background

The existing NPDES permit for Memphis' Stiles wastewater treatment plan ("WWTP") contains the following narrative requirement pertaining to color:

"The wastewater discharge must not cause an objectionable color contrast in the receiving stream."

Industrial users of Memphis' Stiles WWTP discharge color to Memphis's facility which, as a result, then discharges color from its permitted outfalls. There have been discussions as to whether Memphis's discharge is in contravention of the narrative color requirement. Both TDEC and EPA assert that they have observed an objectionable color contrast. Memphis (as well as its industrial users subject to pass through prohibition) has expressed concern that the narrative standard is subjective and as to whether it provides a definitive goal for permit compliance.

TDEC and Memphis want to assure that Memphis's discharge is in compliance with applicable narrative water quality requirements. The underlying water quality standard for recreation uses provides:

"There shall be no color that...will result in any objectionable appearance to the water, considering the nature and location of the water." (Tenn. Code Ann. §1200-4-3-.03(4)(d)).

Memphis commented on a draft NPDES permit to be reissued to Memphis' wastewater treatment plants requesting that TDEC include numeric limitations. Memphis and TDEC have agreed that for the next permit renewal subsequent to completion of the Color Study, the development of a numerical effluent limitation is preferable.

This proposed State Project has been developed by Memphis under the agreed-upon Consent Decree. This State Project provides for Memphis to undertake a Color Study with the objective of providing information to TDEC to facilitate development of a numerical effluent limitation for color in the Stiles NPDES permit.

Under this proposal Memphis would undertake a study, that it is not otherwise currently legally obligated to undertake, to assist TDEC in the development of a numerical color permit limit. It is expected that this study would have water quality benefits in that it could lead to a numerical NPDES permit limit for color that clearly delineates when Memphis (and its industrial users) are in compliance/noncompliance. As such, it could reduce risks to the environment by giving Memphis and the industrial users generating the underlying color a clear path to remove and treat color, if necessary, using the most reasonable and efficient approaches.

## **B. Scope of Color Study**

In discussions with EPA and TDEC, it has become apparent that there is not a lot of experience in color studies to develop numerical effluent limits based on an underlying narrative water quality standard. The few studies that have been identified were undertaken years ago. While the results and approach used in these studies are set forth in the applicable reports, little information is known about the underlying costs and resource demands.

Based upon the approach used in other studies, Memphis is considering undertaking a “color panel” study. In essence, a “color panel” study is based upon the perceptions of the various participants as to what is objectionable and is not objectionable under various conditions. Thus, the study is not based upon water quality engineering principles but, instead, is more psychologically-based, involving the perceptions of the study’s participants.

While TDEC and Memphis believe that the amount of funding of the study as provided in this Appendix J to be appropriate, the uncertainties associated with such an unusual study necessitates that there be flexibility. As such, the approach provided in this Appendix J to the Consent Decree provides Memphis with latitude to reallocate the State Project Funds initially indicated for the Color Study.

Memphis will initially fund the Color Study in the amount of \$200,000 and, shall provide such additional funding as is necessary to undertake the Color Study but in no event shall Memphis be required to fund the study for more than \$400,000. Nothing herein, however, shall prevent Memphis and TDEC from subsequently agreeing that Memphis may fund the study for an additional amount from the Total State Project Funds as Memphis and TDEC deem appropriate. If the Color Study costs less then Memphis will use the remaining State Project Funds for State Project B.

As the perceptions of the “color panel” are, in essence, being used to determine what is “objectionable” color, it is important that if a color panel study is undertaken, that it addresses varying background conditions. Perceptions of “objectionable” color can be impacted by a number of factors including, but not limited to:

- Background color of the receiving water upstream of Memphis’s discharge
- Seasonal differences
- Receiving water flow levels
- Lighting conditions (e.g., time of day, cloud cover)
- Background riverscape
- River depth and width
- Turbidity
- Turbulence
- Bottom characteristics
- Amount, type and distance of flora

- Observer and viewing locations
- River’s context (e.g., industrial site vs. wooded site)

The study may include site visits of the participants and/or pictures/slides of various conditions. While the study may not address all of these factors, it is recognized that perception can be influenced by a number of site conditions and other factors such that the study would need to include various seasons and be sensitive to the range of other factors potentially affecting perceptions. Moreover, the underlying narrative water quality standard for color is based upon consideration of the nature and location of the receiving water.

The color to be evaluated will be the color of the receiving water upstream and downstream of the discharge.

**C. Schedule**

While TDEC and Memphis are initially agreeing to the following schedule, they both recognize that, due to the inherent uncertainties associated with the undertaking of a Color Study, the schedule should provide for flexibility. As issues arise, Memphis may request additional time. This schedule may be amended by agreement of TDEC and Memphis. TDEC’s agreement to additional time requests, if applicable, shall not be unreasonably withheld.

1.	In collaboration with TDEC, Develop Scope of Work, Goals and Objectives, Methodology (color panel or similar)	90 days after Consent Decree Effective Date, Submit for TDEC approval
2.	Selection Process and Award Contract	150 days after TDEC approval*
3.	Conduct Study	18 months after awarding contract
4.	Share Initial Study Results with TDEC	60 days after completion of study
5.	Finalize Study and Submit to TDEC	60 days after review with TDEC

\*Memphis reserves its rights to reject any and all bids in response to the RFP, after consultation with TDEC. In such case Memphis shall consult with TDEC on Memphis’ future action concerning the State Project. Future action may include but not be limited to rebidding the Color Study; modifying the study parameters; or placing all of the State Project Funds into State Project B. If the study is rebid or the plan modified, then an additional 120 days is automatically provided.

While the City has agreed to undertake the Color Study as described above, the City reserves its rights regarding, among other things, whether TDEC’s development of a numerical permit effluent limitation for color is undertaken in accordance with applicable law and whether the ultimate numerical limit chosen by TDEC is appropriate.

### **III. STATE PROJECT B: GEOGRAPHIC INFORMATION SYSTEM (GIS)**

#### **A. Background**

The existing sanitary sewer record system for Memphis contains more than 17,000 drawings, plans and other records. The Public Works Environmental Engineering Department and City Engineering over the years have developed a “paper-based GIS” which allows them to access much of the information contained on those records through the use of “hard-copy” map books and other mechanisms. While some of these documents are updated on an annual basis, newer technologies are available that can facilitate updates and give better access to information. Also new technologies are now available which can readily allow sewer records to be compared with aerial photos and other utility information. While the existing system functions properly with the current maintenance and administrative personnel, future employees not having this institutional history and familiarity with the sewer system are expected to benefit from translation of Memphis’s sanitary sewer records into an electronic GIS.

This second proposed State Project has been developed by Memphis as an additional mechanism which provides for expenditure of any remaining State Project Funds to be spent by Memphis for State Project B - GIS under this Appendix J after undertaking the State Project A - Color Study. This State Project B - GIS provides for Memphis’s Public Works Environmental Engineering Department to undertake translation of a portion of its sanitary sewer database into a form that can be integrated into Memphis’s overall backbone GIS program. This work will not fund the complete translation and integration of all sanitary sewer data into the GIS system but it will consume any of the \$645,000 State Project Funds not spent on the primary State Project A – Color Study. Once the extent of the primary State Project A – Color Study has been defined sufficiently to determine anticipated cost, Memphis can start spending funds on this State Project B - GIS. Due to the uncertainties associated with the cost of the State Project A - Color Study, the schedule for this State Project B - GIS provides time for Memphis to assess how much additional State Project Funds remain and to spend such funds on the State Project B - GIS. The total expenditure by Memphis for State Project A Color Study and State Project B – GIS will be \$645,000.

Memphis’ Information Services Division (IS) has a contract with the University of Memphis to undertake various GIS work on behalf of Memphis. While the contract does not provide for the inclusion of Department of Public Works sanitary sewer data (as further discussed below), this contract potentially can be used as a vehicle for having such data inputted into a GIS system.

Under this proposal Memphis would undertake to begin implementing the translation of its sanitary sewer record system information into GIS format. While Memphis is not otherwise legally obligated to undertake this work, both TDEC and Memphis agree that it will assist in improving future City sanitary sewer system management. Memphis anticipates that the GIS will potentially result in quicker responses to overflows; more efficient tracking of overflows; and improved efficiency in sanitary sewer system maintenance.

**B. Scope of the GIS Project**

Under this State Project B – GIS, the sanitary sewer plan/record information will begin with the scanning and geo-location of drawings and plans. Memphis will digitize paper maps of the sanitary sewer system into an electronic Geographic Information System (GIS) format. On a basin-by-basin basis, the paper maps will be scanned into images which can be geo-located based on the location of the areas mapped. The sanitary sewer lines (pipes) and points (connections/manholes) will be extracted from the paper map and stored in Memphis’s Enterprise GIS. Attributes of the lines and points will be captured in an attribute data table which can be accessed by the GIS.

Inasmuch as the Consent Decree identifies certain priority areas for assessments as set forth in Appendices E and F, the funds obligated under the State Project will be used first to cover the translation of sanitary sewer information in those same areas. The funds will then be used to cover adjacent portions of Memphis and will continue in an expanding fashion outward from the starting point or in such other fashion as Memphis deems appropriate until the State Project Funds are expended.

While nothing in the Consent Decree requires Memphis to expend funds for the State Project A Color Study and State Project B – GIS beyond \$645,000, Memphis subject to its sole discretion is not precluded from expending additional funds to undertake additional work beyond that provided herein.

**C. Schedule**

While TDEC and Memphis are initially agreeing to the following schedule, both agencies recognize that, due to the inherent uncertainties of executing State Project A, this schedule should provide for flexibility. As issues arise, Memphis may request adjustments to this schedule including possible additional time to complete same. TDEC’s agreement to time adjustments, if applicable, shall not be unreasonably withheld.

1.	Engage City’s GIS contractor to begin work*	120 days after Consent Decree Effective Date
2.	Complete GIS State Project Work	18 months after Completion of State Project A – Color Study
3.	Finalize State Project Completion Report and Submit to TDEC	60 days after work Completion

\*City estimates based upon existing contract between IS and University of Memphis. If contract is terminated or not extended, Memphis will attempt to engage University of Memphis under separate agreement to complete the work or else find another appropriate entity to undertake the work. Additional time shall be provided as necessary.