

**RESOLUTION 18-10**

**A RESOLUTION AUTHORIZING A PROFESSIONAL SERVICES AGREEMENT WITH  
DEMPSEY DILLING ASSOCIATES, P.C. FOR SERVICES RELATED TO THE CITY'S  
WATER TREATMENT PLANT**

**WHEREAS**, the City desires to expand its Water Treatment Plant (WTP) from four million gallons per day to six million gallons per day; and

**WHEREAS**, the City desires the ability to expand the WTP's production up to ten million gallons per day by 2030; and

**WHEREAS**, the cost for this expansion will include capital outlay in the form of loans; and

**WHEREAS**, to be eligible for Drinking Water State Revolving Fund Loan Program a facility plan must be prepared by the City; and

**WHEREAS**, the facility plan must follow a suggested outline by the Tennessee Department of Environment and Conservation; and

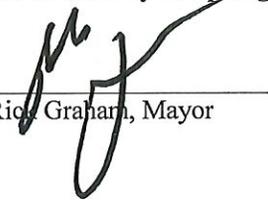
**WHEREAS**, Dempsey Dilling Associates, P.C. has the experience and knowledge to develop a facility plan for the water treatment plant; and

**WHEREAS**, by entering into this Agreement, Dempsey Dilling Associates, P.C. affirms that it has extensive experience in providing engineering services and that it shall provide such services in a professional manner in accordance with the terms and conditions of this Agreement as well as the standard of care practiced by other consultants and professionals performing similar services within the industry.

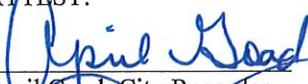
**NOW, THEREFORE**, in consideration of the premises and recitals hereinabove set forth, which are incorporated herein by reference, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the mutual covenants contained herein, the City and Dempsey Dilling Associates, P.C. agree to the execution of the work.

**BE IT FURTHER RESOLVED**, that the City of Spring Hill authorizes a professional services agreement with Dempsey Dilling Associates, P.C. for professional engineering services related to preparing a facility plan for the City's Water Treatment Plant in the amount of in the amount of Two Hundred Ninety Thousand Dollars (\$290,000.00) with monies coming from the Water Fund Reserve.

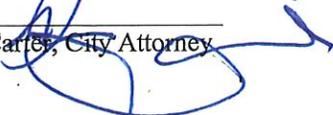
**Passed and adopted by the Board of Mayor and Aldermen of the City of Spring Hill, Tennessee on the 20<sup>th</sup> day of February, 2018.**

  
\_\_\_\_\_  
Rick Graham, Mayor

ATTEST:

  
\_\_\_\_\_  
April Goad, City Recorder

LEGAL FORM APPROVED:

  
\_\_\_\_\_  
Patrick Carter, City Attorney

## EXHIBIT A

### **CITY OF SPRING HILL, TENNESSEE WATER TREATMENT PLANT AND RAW WATER INTAKE FACILITY PLAN ENGINEERING SCOPE OF SERVICES**

As requested, Dempsey, Dilling & Associates, P.C. (DDA) *Engineering Consultants* is pleased to submit a contract proposal to provide engineering services, in accordance with our current contract with the City of Spring Hill. This proposal is for development of a Facilities Plan report and associated documents to evaluate an expansion of the existing Water Treatment Plant (WTP) and Raw Water Intake from its current design capacity of 4.0 Million Gallons per Day (MGD) to 6.0 MGD. Our proposal is based on providing engineering services to develop the Facility Plan in accordance with Tennessee Department of Environment and Conservation (TDEC) and Drinking Water State Revolving Fund (DWSRF) requirements. Additionally, capacity for the WTP to expand to a long term capacity of 10 MGD will be evaluated, in addition to the Facilities Plan development. DDA with support from O'Brien & Gere (OBG) proposes to perform the following tasks:

1. Schedule a project kick-off meeting with the Project Team to discuss the City's goals associated with the WTP Facility Plan to address expansion to 6 MGD. Additional meetings will be scheduled with both TDEC and City Staff as necessary in order to adequately address the entire scope of services.
2. Utilizing existing Raw Water intake flow data, an evaluation will be performed of the existing pump capacity, raw water transmission line conveyance capacity, carbon feed system capacity, and SCADA control system.
3. Utilizing the existing WTP plans and specifications, operator data, Monthly Operating Reports (MORs), and most recent site topographic survey, develop a strategy to addresses expansion capacity and limitations for each treatment component, including: WTP clarifiers, filters, chemical feed, clearwell capacity, high service pump capacity, backwash solids handling and plant SCADA controls.
4. Investigate treatment technologies with Spring Hill staff to address the required capacity improvements to meet an expansion to 6 MGD and achieve drinking water standards. This phase will include off-site visits to existing facilities which have the treatment technologies in place for review and staff input. On-site pilot testing at Spring Hill's WTP (contracted by the City with staff overview) is recommended as to allow a complete evaluation of the different treatment technologies such micro-filtration (ceramic and polymeric filters) to be performed.
5. Prepare a facility plan in accordance with TDEC Preliminary Engineering and DWSRF requirements. The plan will address the following topics (an outline of the DWSRF report requirements is also attached):
  - A. Description of the existing water treatment facilities.
  - B. Description of existing and future service areas.
  - C. Water supply alternatives.
  - D. Water consumption to include:
    - estimated population,
    - present and future water consumption,
    - distribution system and storage capacities,
    - water losses in system.
  - E. Fire flow requirements
  - F. Source of water supply - Describe the proposed source of water supply to include:
    - hydrological data and stream flow,
    - factors that may affect downstream flow,
    - quality of raw water.
  - G. Proposed treatment process description to include:
    - design criteria
    - pilot studies,
    - hydraulic calculations and hydraulic profiles,
    - treatment basin capacities,

- retention times of basins and clearwell,
  - treatment unit loadings,
  - filter area and proposed filtration rate,
  - backwash rate,
- H. Backwash Solids disposal description to include:
- Proposed treatment,
  - Point of discharge to stream,
  - Conveyance to wastewater treatment plant.
- I. Existing raw water intake and water treatment plant site descriptions.
- J. Distribution and storage facilities description, to include map of overall distribution system showing existing and proposed components.
- K. Opinion of probable construction cost for each alternative considered.
- L. Description of long term future expansions and evaluation of potential buy-sell agreements with Columbia Power and Water System and Maury County Water System.

Additional information will be included within the facilities plan to meet SRF Loan Program requirements. Refer to the attached Facilities Plan outline for the report format.

6. Evaluate potential water reuse opportunities as to allow a decrease in capacity demand on the water treatment plant.
7. Evaluate the requirements for the subsequent expansion of the WTP to 10 MGD in order to meet long term water capacity needs.

**DDA proposes to perform tasks 1 through 7 for a lump sum cost of \$290,000.00.** If approved, DDA's monthly billing will be based on the percent complete of the project. Should additional tasks be requested by the City, the hourly fees and associated additional services costs as outlined in the attached terms and conditions will apply. DDA anticipates completion of tasks 1 through 7 to develop the facilities plan as outlined in the below project schedule. This time frame is based on the assumption that no delays will be incurred during development of the facilities plan. If delays are experienced, DDA will respectfully ask the City for consideration of additional time to complete all tasks.

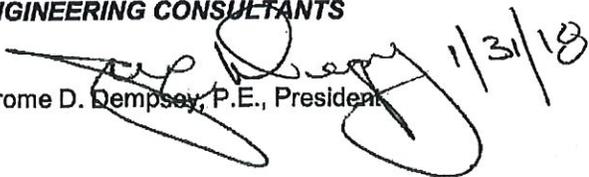
ANTICIPATED PROJECT SCHEDULE

<u>Activity</u>	<u>Date</u>
Assumed Notice to Proceed	Feb 2018
Kickoff Meeting with Spring Hill Staff	Feb 2018
Meet with TDEC Officials	Mar 2018
Raw Water Intake and WTP Site Evaluations	April 2018
Site Visits to Evaluate Treatment Technologies	May 2018
Alternatives Analysis	July 2018
Prepare Opinion of Probable Construction Costs	Aug 2018
Future Expansion to 10 MGD Evaluation	Oct 2018
Draft Report	Apr 2019
Meet with TDEC	May 2019
Final Report	June 2019

Should additional services be required other than presented in the facilities plan scope of services, DDA will request a revision to the proposal in accordance with our current contract rate schedule and "Terms and Conditions". DDA appreciates the opportunity to provide professional engineering services to the City of Spring Hill for this specified project. Should you have any questions or comments please give me a call.

Sincerely,  
**DEMPSEY, DILLING & ASSOCIATES, P.C.**  
**ENGINEERING CONSULTANTS**

Jerome D. Dempsey, P.E., President



## **EXHIBIT A-2**

### **DRINKING WATER SRF PLANNING REQUIREMENTS**

#### **INTER-DISCIPLINARY ENVIRONMENTAL REVIEW**

Please e-mail the following items to the State Revolving Fund Loan Program for our coordination of a mandatory, 30-day inter-disciplinary environmental review (IER) of the proposed project:

- An electronic (.JPG or .PDF), 8½" x 11" color figure based on the appropriate portion of the most current USGS 7.5-Minute topographic quadrangle map showing the location of the planning area
- An electronic (.JPG or .PDF), 8½" x 11" color figure based on the appropriate portion of the most current USGS 7.5-Minute topographic quadrangle map showing the location of the proposed project
- A clear, concise project description (.DOC)

The State Revolving Fund Loan Program will forward the submittals to the following agencies and solicit their input:

TDEC, Division of Air Pollution Control	Tennessee Department of Transportation
TDEC, Division of Archaeology	Tennessee Department of Economic and Community Development
TDEC, Division of Water Resources	Tennessee Historical Commission
TDEC, Natural Heritage Program	Tennessee Wildlife Resources Agency
TDEC, Division of Solid Waste Management	United States Army Corps of Engineers
Tennessee Department of Agriculture	United States Fish and Wildlife Service

## **DRINKING WATER SRF PLANNING REQUIREMENTS**

### **RECOMMENDED FACILITIES PLAN OUTLINE –DWSRF**

The following outline is a suggested outline for the presentation of the required information for a Drinking Water State Revolving Fund Facilities Plan/planning document. Some of the information requested may not be applicable for certain projects.

- 1.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**
  - 1.1 Statement of the Problem
  - 1.2 Summary of the Alternative Solutions Considered
  - 1.3 Recommended Solution
- 2.0 PURPOSE AND NEED**
  - 2.1 Study Purpose
  - 2.2 Need for the Project
- 3.0 GENERAL INFORMATION**
  - 3.1 Existing Facilities and Area Served
  - 3.2 Optimum Performance Available with the Existing Facilities/Operational Problems
  - 3.3 Existing Distribution System (indicate mains, storage facilities, and pumping stations)
  - 3.4 Potential for Serving Additional Areas
- 4.0 FUTURE CONDITIONS**
  - 4.1 Planning Period (20 years)
  - 4.2 Land Use Projections
  - 4.3 Population Forecast
  - 4.4 Storage Capacities and Losses in the System
  - 4.5 Fire Flow Requirements
- 5.0 DEVELOPMENT OF ALTERNATIVES**
  - 5.1 No-Action Alternative
  - 5.2 Minimum of three viable alternatives compared for cost effectiveness, environmental impacts, and feasibility
  - 5.3 Chosen Alternative
- 6.0 SELECTED PLAN DESCRIPTION**
  - 6.1 Proposed Treatment Process
    - 6.1.1 Capacities, retention times, loadings, filter area, filtration rate, and backwash rate
  - 6.2 Water Source and Demand Requirements
    - 6.2.1 Stream Flow Data
    - 6.2.2 Existing or potential groundwater sources
  - 6.3 Effects to or from any Wastewater Treatment Facility
  - 6.4 Site Selection (sites considered and the chosen site)
  - 6.5 Soil Conditions (for water line placement and foundations)
  - 6.6 Public Involvement Public Meeting
- 7.0 PROJECT COSTS**
  - 7.1 Estimated Construction Costs and Overall Project Costs
  - 7.2 Proposed Financing
  - 7.3 Projected Operating Costs and Water Rate Structure
- 8.0 ENVIRONMENTAL IMPACTS**
  - 8.1 Planning Area and Project Area (indicated on USGS quad map)
  - 8.2 Project Specific Impacts
- 9.0 ENVIRONMENTAL JUSTICE CONCERNS**
  - 9.1 Identification of Minority and Low-Income Populations in Project Area
  - 9.2 Evaluation of Disproportionate Risks to Identified EJ Populations
  - 9.3 Identification of Public Participation Opportunities for Identified EJ Populations
  - 9.4 Evaluation of Environmental/Health Risks among Identified EJ Populations that may be Exacerbated by Proper Construction and Operation of the Selected Alternative

#### **Maps and Figures**

**APPENDICES** (supporting documentation as appropriate)

## DRINKING WATER SRF PLANNING REQUIREMENTS

### FACILITIES PLANS

A Facilities Plan must demonstrate the need for a proposed action, evaluate viable alternatives, and select the most cost-effective, implementable, and environmentally sound solution that will meet the public needs over the design life of the facility. A Facilities Plan must include an evaluation of the current and future population of the facilities planning area and their water needs. It must also present a comprehensive evaluation of the current environment in the planning and project areas, potential impacts to the environment caused by the construction of the proposed project, and actions necessary to prevent potential negative environmental impacts. A Facilities Plan must also demonstrate and document public participation in the decision-making process. Four copies of a Facilities Plan must be presented to the State Revolving Fund Loan Program for our timely completion of required technical and environmental reviews prior to recommending the Drinking Water State Revolving Fund (SRF) loan award to the Tennessee Local Development Authority.

A Facilities Plan should contain an Executive Summary, detailed descriptions of the proposed project's purpose and need, existing and future conditions; development of alternatives; an evaluation of the principal alternative(s); and the selected plan. The text of a Facilities Plan should be augmented with a topographic map of the planning and project areas and any other maps and figures necessary to graphically convey and support the technical and environmental information presented and the alternative(s) selected. Conclusions and recommendations provided in the Facilities Plan must be supported by the technical and environmental information presented therein.

The following summarizes the technical and environment information that is generally required in a Facilities Plan.

#### Technical Information Requirements

- An executive summary of the Facilities Plan including conclusions and recommendations
- A discussion of the purpose and need for the **proposed project**. Only projects that will benefit public health and/or achieve or maintain regulatory compliance are eligible for funding. **Growth-type projects are ineligible for funding.**
- A discussion of general information, including detailed descriptions of existing treatment and distribution systems and the area served, supplemented by appropriate maps and figures showing all water treatment plants, mains, surface water intake and/or raw water supply wells, and pump stations in the project planning area; system design capacities and existing flows; the age(s) and reliability of existing equipment and respective remaining useful lives; distribution system performance with emphasis on any distribution problems relative to undersized components; treatment plant performance **compared to applicable regulations and the facility's permit**; an evaluation of the capacity and quality of the existing water source and its ability to meet existing and projected water needs; the achievable optimum performance level possible with the existing facilities; the need for additional operating controls and facilities to improve operations, and possible system or process modifications to achieve optimum performance; and a discussion of the system's operation and maintenance (O&M) program, its effectiveness, and possible modifications. If applicable, copies of existing operating permits and operations and maintenance manuals should be included in the Appendix.
- A discussion of the planning period, including current and projected populations, land use, and water needs for the subsequent 20 years, including storage capacities, losses in the system, and the potential to serve additional areas should be included. A discussion of fire protection flow requirements needs and measures should be included in the planning document as well. An assessment of potential environmental justice (EJ) concerns, including a description of any minority/low-income populations located within the planning area, a discussion of the potential for the selected alternative to present a disproportionate risk to identified EJ populations, identification of any current environmental or health risks that will be exacerbated by implementation of the selected alternative, and identification of mitigative actions necessary to eliminate any disproportionate risks to identified EJ communities.

The following table summarizing the percent of the population served for the 20-year planning period for the municipality, the planning area excluding the municipality, and the total planning area must also be completed and inserted into the text. Please include this table in the planning document, as it is a useful summary tool. A discussion of the source and reasonableness of the population and flow projections should supplement the table.

**DRINKING WATER SRF PLANNING REQUIREMENTS**

**EXISTING AND PROJECTED FACILITY CONDITIONS**

<u>Population</u>	<u>Existing (200?)</u>	<u>Projected (20?? 20 yrs later)</u>
City of [????]	#	#
Percent Served	%	%
Service Area Excluding City of [????]	#	#
Percent Served	%	%
Total Planning Area	#	#
Percent Served	%	%
 <u>Flows in gallons per day (gpd)</u>		
Residential	#	#
Commercial	#	#
Industrial	#	#
Loss	#	#
<b>Total Flows</b>	#	#

- **Development of alternatives**, including a "No-action" alternative discussion, and a detailed description of a minimum of three viable alternatives. The alternatives evaluation must include an engineering evaluation, including an assessment of whether adequate capacity will be provided for projected needs during the 20-year planning period, reliability, revenue generating applications (if applicable), reduction or recovery of energy (if applicable), process complexity; and filter backwash disposal alternatives (if applicable to the proposed project), with appropriate consideration of the size and location of the project, and compliance with regulatory requirements regarding backwash sludge treatment and/or disposal methods. The evaluation of alternatives must also include a present-worth comparison of cost-effectiveness over the 20-year planning period, which considers capital costs, useful life, planned staging of construction (if applicable), salvage value, replacement costs, O&M costs, and interest during construction; development of the alternatives including consideration of environmental impacts, engineering feasibility, and implementability (inter-municipal agreements, regulatory requirements, and mitigation requirements); presentation of sound reasons for rejecting alternatives not considered worthy of further analysis; and identification of the chosen alternative(s).
- A **discussion of relevant design parameters** for all major system components of the selected alternative(s) should be presented. Selected alternative(s) should be evaluated with respect to compliance with the *State of Tennessee's Community Public Water Systems Design Criteria*.
- A schedule showing appropriate planning, design, and construction milestone dates
- **Documentation of public involvement**, including a complete copy of the Public Meeting transcript, a copy of published advertisement and a Notarized Publisher's Affidavit as proof of the advertisement publication. The public involvement documentation must demonstrate the opportunity for public awareness of the planned project, including any special measures taken to ensure awareness of identified environmental justice communities. The public involvement documentation must also demonstrate that the public was provided a complete description of the project, the project schedule, an assessment of short-term impact verses long-term benefits, and a description of current user fees and the amount of any required increase(s) to the current user fees resulting from the repayment of the Drinking Water State Revolving Fund loan and funding of depreciation. Documentation need not be submitted concurrently with the planning document; however, the planning document will not be approved until the public involvement requirement is satisfied.
- Draft copies of all Inter-Municipal Agreements (IMAs) required to implement the proposed project and Authorizing Resolutions from the municipalities obligated in the IMAs
- A discussion of the proposed financing for planning, design, and construction of the selected alternative(s), anticipated system operations and maintenance costs upon completion of the proposed project, the water rate

## **DRINKING WATER SRF PLANNING REQUIREMENTS**

structure, and any increases in water rates necessary to support the post-construction funding of debt service, depreciation, and operations and maintenance costs

### **Environmental Information Requirements**

- Present and future land use and growth trends in the planning and project areas
- Topography in the planning and project areas
- Descriptions of the hydrology and hydrogeology in the planning and project areas, including a description of the planning area's waterbodies, aquifers and surface and ground water quantity, quality, and users.
- Descriptions of the geology in the planning and project areas, including a description of major features in the project area and physiographic provinces
- Descriptions of soils in the planning and project areas, including distributions, their respective limitations, and NRCS Soil Maps (if possible)
- Descriptions of historical and archeological features in the planning and project areas
- Identification of listed threatened, endangered, or otherwise protected flora and fauna species in the planning and project areas, particularly in the immediate vicinity of any portion of the proposed project and downstream from a proposed discharge point
- A discussion of the community's wastewater treatment system, including the location(s) of points of wastewater discharge, the potential for the proposed project to be impacted by treated wastewater effluent discharges, and possible actions to prevent impacts
- A description of mitigative actions potentially necessitated by the proposed project to reduce noise, dust, odor, etc. from construction activities, and to avoid erosion and sedimentation of nearby streams and water bodies during construction activities (silt fence, straw bales, holding ponds, temporary and permanent revegetation, etc.)
- A discussion of ambient air quality in the planning and project areas, the potential impacts to air quality resulting from the proposed project, and possible actions to prevent impacts
- A discussion of the potential for the proposed project to disturb, damage, or adversely effect historical or archaeological sites or prime and/or unique agricultural land during construction activities and possible actions to prevent impacts
- Identification of any designated Wild or Scenic Rivers in the planning and project areas, the potential for impacts resulting from construction of the proposed project, and possible actions to prevent potential impacts
- A discussion of the potential for the proposed project to disturb, damage, or adversely effect fish and wildlife and mitigative actions to prevent potential impacts
- The locations and descriptions of jurisdictional wetlands in the project area and a discussion of the potential for the proposed project to disturb, damage, or adversely effect those areas, and mitigative actions to prevent potential impacts
- A description of stream crossings potentially necessitated by the proposed project, permit requirements (ARAP, TVA, US Army Corps of engineers section 10 and/or 404, etc.), if necessary, and mitigative actions to prevent adverse impacts during stream crossings
- A floodplain map indicating project location, a discussion of whether the proposed project will be below the 100-year flood elevation, and mitigative actions to prevent potential impacts from flooding, if necessary
- A discussion of the potential impacts to residential areas during construction, whether any significant displacement of population would be necessitated, and mitigative actions to prevent the alteration of the character of existing residential neighborhoods

### **Environmental Justice Information**

- Have any minority or low-income populations been identified within the project area?
- Does the selected alternative present disproportionate risks to the minority or low-income populations identified within the project area?

## **DRINKING WATER SRF PLANNING REQUIREMENTS**

- Have the minority or low-income populations identified within the project area been provided an opportunity for public participation?
- Do the minority or low-income populations identified within the project area suffer from environmental/health risks that will be exacerbated by the proper construction and operation of the selected alternative?

**AGREEMENT BETWEEN  
CITY OF SPRING HILL, TENNESSEE  
AND DEMPSEY DILLING AND ASSOCIATES, P.C.**

**THIS AGREEMENT** is made this the 20<sup>th</sup> day of February, 2018, by and between **CITY OF SPRING HILL, TENNESSEE** (hereinafter "City"), and **DEMPSEY DILLING AND ASSOCIATES, P.C.**, located at 502 Hazelwood Drive, Smyrna, TN 37167 (hereinafter "Dempsey Dilling").

**WITNESSETH:**

**WHEREAS**, the City desires to expand its Water Treatment Plant (WTP) from four million gallons per day to six million gallons per day; and

**WHEREAS**, the City desires the ability to expand the WTP's production up to ten million gallons per day by 2030; and

**WHEREAS**, the cost for this expansion will include capital outlay in the form of loans; and

**WHEREAS**, to be eligible for Drinking Water State Revolving Fund Loan Program a facility plan must be prepared by the City; and

**WHEREAS**, the facility plan must follow a suggested outline by the Tennessee Department of Environment and Conservation; and

**WHEREAS**, the Dempsey Dilling and Associates has the experience and knowledge to develop a facility plan for the water treatment plant; and

**WHEREAS**, by entering into this Agreement, Dempsey Dilling affirms that it has extensive experience in providing engineering services and that it shall provide such services in a professional manner in accordance with the terms and conditions of this Agreement as well as the standard of care practiced by other consultants and professionals performing similar services within the industry.

**NOW, THEREFORE BE IT RESOLVED**, in consideration of the premises and recitals hereinabove set forth, which are incorporated herein by reference, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, and the mutual covenants contained herein, the City and Dempsey Dilling agree as follows:

**ARTICLE 1-SCOPE OF SERVICES TO BE RENDERED BY DEMPSEY DILLING  
AND ASSOCIATES**

1. Dempsey Dilling shall perform all necessary professional services in a satisfactory and proper manner, consistent with the City's requirements for the Project and by reference made a part hereof, including, but not be limited to, the following:

a. **See Attached Exhibit A (Scope of Work)**

2. All documents prepared by Dempsey Dilling that form a part of the services rendered hereunder shall, upon completion of the drawings, become the property of the City. Such documents shall not be used by either party on any other project, except as reference materials.

3. The City will furnish all information, data, reports and maps as are existing and identified by Dempsey Dilling as necessary for carrying out the work that are available to the City without cost to Dempsey Dilling.

4. Dempsey Dilling shall have the authority to request work assignments necessary to obtain additional information to prepare the facility plan.

#### **ARTICLE 2-CITY'S RESPONSIBILITIES**

The City will provide to Dempsey Dilling all criteria and full information as to the Project's requirements, and shall furnish the following:

1. Provide Dempsey Dilling with all known available information that is pertinent to the Project.

2. Accompany Dempsey Dilling for on-site inspections to determine scope of work, if necessary.

3. Guarantee access to the work so Dempsey Dilling can enter upon public and private lands as required to perform the work essential to the Project.

4. Give thorough consideration to all reports, cost estimates, drawings, specifications and other documents presented by Dempsey Dilling, and inform Dempsey Dilling of all decisions within a reasonable time so as not to delay the work of Dempsey Dilling (i.e. furnish approval or instructions for change).

5. Promptly schedule all required special meetings, serve all public and private notices, and receive and act upon all protests.

6. Give prompt written notice to Dempsey Dilling when it is known that either the Project criteria or conditions have changed, or there is reason to believe Dempsey Dilling's work is deficient in intent or technical content.

7. Provide information previously assembled by others, including soil borings, probings, subsurface explorations, hydrographic surveys, laboratory tests and inspections of samples and materials, appropriate professional interpretation of all of the foregoing, environmental assessment, impact statements, approvals and permits from regulatory agencies, and other special data or consultation.

#### **ARTICLE 3-TERM**

1. The services of the Consultant shall be undertaken and completed by June 30, 2019.

#### **ARTICLE 4-FEES**

1. In consideration of the performance of services rendered under this Contract, Dempsey Dilling shall be compensated for services performed in accordance with Article 1, not to exceed a not to exceed fee of Two-Hundred Ninety Thousand Dollars (\$290,000). The fee is

inclusive of expenses such as printing, travel, postage, phone calls, etc.

2. Invoices shall be submitted by Dempsey Dilling to the City in monthly statements for services rendered, if any. The statements shall be based on percent completion of the lump sum amount, and incurred expenses. Each individual invoice shall be due and payable within forty-five calendar (45) days after receipt.

3. If the City disputes any portion of Dempsey Dilling's invoices, the undisputed portion will be paid by the City, and Dempsey Dilling will be notified in writing within ten (10) days of receipt of the exceptions taken to such invoice. The City and Dempsey Dilling will attempt to resolve any payment dispute within sixty (60) days, and both parties agree that no action for collection thereon shall be filed within this time period.

4. If the City delays the Project for more than six (6) months beyond the designated date when work is scheduled to begin, which is more particularly defined as the date this Agreement is executed, then the lump sum as designated in Sub-Paragraph 1 of this Section shall be increased by three percent (3%) per year. The intent of this language is that the increase shall be cumulative, as a delay would cause Dempsey Dilling to have to revisit the plans created in accordance with the designated start date as defined herein.

#### **ARTICLE 5-PRIMARY CONTACT**

The primary contact for each party shall be:

If to Dempsey Dilling:

Attn: Jerome Dempsey  
Title: Principal and Project Manager  
Dempsey Dilling and Associates.  
502 Hazelwood Drive  
Smyrna, TN 37167

If to Philip Stuckert and Caryl Giles:

Attn: Philip Stuckert/Caryl Giles  
199 Town Center  
P.O. Box 789  
Spring Hill, TN 37174

#### **ARTICLE 6-NOTICE**

All notices, certificates or other communications hereunder shall be deemed sufficiently given and shall be deemed given when delivered by hand-delivery or mailed by first class, postage prepaid, registered or certified mail and addressed to the following persons who shall be the primary contact for their party.

If to Dempsey Dilling:

Attn: Jerome Dempsey  
Title: Principal and Project Manager  
Dempsey Dilling and Associates.  
502 Hazelwood Drive  
Smyrna, TN 37167

If to City:

Attn: Victor Lay  
Title: City Administrator

199 Town Center Parkway  
Spring Hill, TN 37174

Copy to:

Patrick M. Carter, Esq.  
City Attorney  
P.O. Box 1431  
Columbia, TN 38402-1431

#### **ARTICLE 7-TERMINATION**

1. This Agreement may be terminated by either party upon thirty (30) days' written notice should the other party fail substantially to perform in accordance with the terms outlined herein through no fault of the party initiating the termination.
2. This Agreement may be terminated by Dempsey Dilling in the event that the City permanently abandons the Project.
3. In the event of termination by either party, Dempsey Dilling shall be compensated for all services performed prior to the termination date.

#### **ARTICLE 8-DISPUTE RESOLUTION AND GOVERNING LAW**

1. The City and Dempsey Dilling shall attempt to resolve conflicts or disputes under this Agreement in a fair and reasonable manner, and agree that if an informal resolution cannot be achieved, the parties shall submit the matter to a mutually agreed upon mediator in an attempt to resolve the dispute through the mediation process. Such mediation process shall be initiated by a request in writing by either party.
2. The mediation provision can be waived by the mutual consent of the parties or by either party if such party's right would be irrevocably prejudiced by a delay in initiating a legal proceeding.
3. Venue and jurisdiction for any legal proceeding hereunder shall be the Circuit Court for Maury County, Tennessee.

#### **ARTICLE 9-BREACH**

1. The term "breach of agreement" specifically includes, but is not limited to, failure to comply with any applicable federal, state or local laws or regulations.
2. One or more waivers of breach of any provision of this Agreement by any party shall not be construed as a waiver of subsequent breach of the same provision, nor shall it be considered a waiver of any other then existing or subsequent breach of a different provision.
3. The substantially prevailing party in any legal proceeding hereunder by and between the parties shall in addition to their damages be entitled to attorney's fees and court costs incurred in said legal proceeding.

#### **ARTICLE 10-MODIFICATION**

This Agreement shall not be modified unless such modifications are evidenced in writing in the form of a written Amendment, which is signed by both the City and Dempsey Dilling. Should any changes in the design of the Project be necessary, the City's designee shall report such change to Dempsey Dilling in writing. If the City determines that any changes in work are necessary to complete the Project, then Dempsey Dilling shall be allowed compensation in accordance with ARTICLE 19-CHANGES.

#### **ARTICLE 11-INDEMNITY AND HOLD HARMLESS**

1. Dempsey Dilling shall agree to indemnify and hold City, its officers, agents and/or employees, harmless from and against any and all lawsuits, damages and expenses, including court costs and attorneys' fees, by reason of any claim and/or liability imposed, claimed and/or threatened against the City, its officials, agents and/or employees, for damages because of bodily injury, death and/or property damages arising out of or in consequence of the performance of services under this Agreement to the extent that such bodily injuries, death and/or property damages are attributable to the negligence of the City, its agents, employees, or any other entity for which the City may be found to be legally liable. This provision shall survive the completion of all services, obligation and duties provided pursuant to the Project, or the termination of this Agreement for any reason.

#### **ARTICLE 12-INSURANCE**

Dempsey Dilling shall maintain, during the term of this Agreement, or any extension hereof, the following insurance policy, written by an insurance company authorized to do business within the State of Tennessee, and furnish City, in duplicate, Certificates of Insurance as evidence thereof:

1. Worker's Compensation: Providing coverage in compliance with the laws of the state in which any part of the work is to be performed, and Employer's Liability Coverage in the minimum amount of the statutory limit for each occurrence.

2. Comprehensive (Commercial) General Liability Insurance: Bodily injury and property damage combined single limit in the minimum amount of \$1,000,000.00 for each occurrence.

3. Automobile (Business) Liability Insurance: Bodily injury and property damage combined single limit in the minimum amount of \$1,000,000.00 for each occurrence, \$1,000,000.00 aggregate.

4. Professional Liability Insurance: Professional liability insurance covering claims arising from errors, omissions or negligent acts committed in the performance of professional services under this Agreement with limits of \$1,000,000.00.

#### **ARTICLE 13-SUBCONSULTANTS**

Dempsey Dilling shall not subcontract all or a portion of the Project without the prior written approval of the City which consent will not be unreasonably withheld. Dempsey Dilling must state in all subcontracts that services performed by any such subconsultant will be subject to the terms of this Agreement. All subconsultants must certify in writing that they are qualified to perform the services to be rendered for the Project and have no financial or other interests in the outcome of the Project. Dempsey Dilling shall remain fully responsible for the performance of subconsultant and its

personnel pursuant to this Agreement. The entry into any subcontract shall not relieve Dempsey Dilling of any of its obligations under the terms of this Agreement

#### **ARTICLE 14-SEVERABILITY**

In the event any provision of this Agreement or any instrument delivered in connection herewith shall be held invalid or unenforceable by any court of competent jurisdiction, such holding shall not invalidate or render unenforceable any other provisions hereof or thereof.

#### **ARTICLE 15-BINDING EFFECT**

This Agreement shall inure to the benefit of and shall be binding upon the parties and their respective heirs, administrators, successors and assigns.

#### **ARTICLE 16-INDEPENDENT CONTRACTOR RELATIONSHIP**

It is specifically understood that Dempsey Dilling's relationship with City shall be that of independent contractor and Dempsey Dilling shall in no sense be considered an agent or employee of City, nor shall Dempsey Dilling be, as a result of the relationship established by this Agreement, entitled to or eligible to participate in any benefits or privileges extended or given by City to its employees, notwithstanding this Agreement.

#### **ARTICLES 17-HEADINGS AND EXHIBITS**

The paragraph headings in this Agreement are for convenience only, and they form no part of this Agreement and shall not affect its interpretation.

#### **ARTICLE 18-FORCE MAJEURE**

Dempsey Dilling shall not be liable to City or be deemed to be in breach of this Agreement for any failure or delay in rendering performance arising out of causes beyond Dempsey Dilling's reasonable control and without its fault or negligence. Such causes may include, but are not limited to, acts of God or the public enemy, terrorism, significant fires, floods, earthquakes, epidemics, quarantine restrictions, strikes, freight embargoes, or Governmental Authorities approval delays which are not caused by any act or omission by Dempsey Dilling, and unusually severe weather. Dempsey Dilling agrees to notify City of the existence and nature of any delay.

#### **ARTICLE 19-CHANGES**

The City may, from time to time, request changes in the scope of the services of the Dempsey Dilling to be performed hereunder. Such changes, including any increase or decrease in the amount of Dempsey Dilling compensation, which are mutually agreed upon between the City and Dempsey Dilling shall be incorporated in written amendments to this Agreement. There shall be no increase in the amount of Dempsey Dilling's compensation, as set forth above, unless approved by Resolution adopted by City.

#### **ARTICLE 20-OWNERSHIP OF PROJECT MATERIALS**

It is agreed that all finished or unfinished documents, data, studies, surveys, drawings, maps, models, photographs, films, duplicating plates, and reports prepared by Dempsey Dilling under this

Agreement shall be considered the property of the City and upon completion of the services to be performed, they will be turned over to the owner provided that, in any case, Dempsey Dilling may, at no additional expense to the City, make and retain such additional copies thereof as Dempsey Dilling desires for its own use; provided further, that in no event may any of the documents, data, studies, surveys, drawings, maps, models, photographs, films, duplicating plates, or other reports retained by Dempsey Dilling be released to any person, agency, corporation, or organization without the written consent of the City.

**ARTICLE 21-CONFIDENTIALITY**

All reports, information, data, etc., given to, or prepared or assembled by Dempsey Dilling under this Agreement, shall be deemed confidential and none shall be made available to any individual or organization by Dempsey Dilling without the prior written consent of the City.

**ARTICLE 22-ASSIGNMENT**

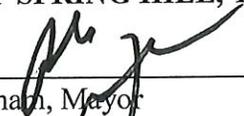
Dempsey Dilling shall not assign, sublet or transfer or otherwise dispose of this Agreement in whole or in part to any individual, firm or corporation without the prior written consent of the City.

**ARTICLE 23-ENTIRE AGREEMENT**

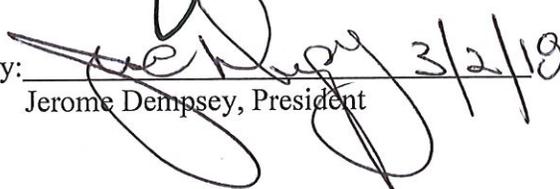
This Agreement and accompanying documents contain the entire agreement between the parties with respect to the subject matter hereof and all prior or contemporaneous written or oral agreements with respect to the subject matter hereof are superseded hereby. The Agreement may be amended only by written instrument signed by both the City and Dempsey Dilling.

**IN WITNESS WHEREOF**, the City has caused this Agreement to be signed by its authorized representative, and Dempsey Dilling has caused this Agreement to be signed in its corporate name by its authorized representative as of the day and year first written above.

**CITY OF SPRING HILL, TENNESSEE**

By:   
Rick Graham, Mayor

**Dempsey Dilling and Associates, P.C.**

By:  3/2/19  
Jerome Dempsey, President

LEGAL FORM APPROVED:

  
Patrick Carter, City Attorney

Date: January 17, 2018

TO: Victor Lay, City Administrator

FROM: Philip Stuckert, P.E. Infrastructure Director  
Caryl Giles, Water Treatment Plant Director

SUBJECT: Professional Services Agreement with Dempsey Dilling and Associates, P.C.

Recommendation:

Request the Board of Mayor and Aldermen to review this memorandum concerning Spring Hill's immediate and future needs for water supply and then consider authorizing Dempsey, Dilling and Associates, P.C. along with their subconsultant O'Brien and Gere to prepare a facility plan report, in the amount of Two-Hundred Ninety Thousand Dollars (\$290,000.00). Monies for this work will come from the Water Reserve Fund.

The report will address expansion of the Spring Hill Water Treatment Plant from 4.0 MGD (current design capacity) to a 6 MGD facility, with the understanding the plant may be expanded in the future to 10 MGD if TDEC approves the withdrawal of additional water from the Duck River. (Spring Hill's current withdrawal permit is for 6.0 MGD.) The facility plan will be coordinated and submitted to TDEC for review and approval consideration.

Summary:

This draft memo provides an update regarding Spring Hill's water supply options, and a preliminary outline and timeline for activities related to securing additional water supply to meet Spring Hill's needs through 2037.

Spring Hill City staff and their consultant, Dempsey, Dilling and Associates, P.C. along with O'Brien & Gere met on December 5, 2017, with Columbia Power & Water Systems (CPWS). The purpose of the meeting was to discuss water supply strategies over the next twenty years (2017 – 2037) between the two communities. Others at the meeting included representatives from Maury County Water System (MCWS). MCWS desires to purchase water from the City of Spring Hill for development east of Interstate 65 and south of the Saturn Parkway interchange. The property east of I-65 is within the City of Spring Hill but is served water by MCWS district. MCWS wishes to purchase additional water from the City of Spring Hill, from the existing 18-inch water line located along Derryberry Lane.

Each party at the meeting was asked to provide an overview of their water demands for the next twenty years and how that demand might be supplied.

The table below provides the projected increase in maximum day demands on MCWS from the new development, located east of I-65, over the next twenty years. MCWS used a 1.8 peaking factor (middle column). Following discussions at the meeting, it was concluded that a 1.5 peaking factor (same as Spring Hill uses) may be more realistic (right column). MCWS desires to purchase water for the new development from either Spring Hill or CPWS. Economically it makes sense for MCWS to purchase

their water from Spring Hill due to lower capital costs of transmitting the water supply from CPWS to the east side of I-65. The water would either be conveyed through a new transmission line (CPWS to MCWS connection point east of I-65) or through Spring Hill's existing water distribution system with required upgrades.

<b>MCWS Projected Water Demands for New Development East of Interstate 65</b>		
Time Period	Maximum Day (gpd) at end of period with 1.8 Peaking Factor (as provided by MCWS)	Maximum Day (gpd) at end of period with 1.5 Peaking Factor
2018 to 2022	619,200	516,000
2023 to 2027	1,238,400	1,032,000
2028 to 2032	1,483,200	1,236,000
2033 to 2037	1,728,000	1,440,000

CPWS withdraws water from the Duck River at the Columbia pool, above the Columbia dam, and treats it at its water treatment plant, which has been previously reported as having 20 mgd production capacity. CPWS said they recently determined that the net reliable capacity is actually only 16.4 mgd. The reductions were reportedly due to several factors:

- Problems using alum as their coagulant when the raw water is cold; CPWS experienced filter clogging and excessive backwashing
- Hydraulic restrictions created by the new GAC and UV facilities
- Use of water for spray-irrigation of residuals.

The following table provides CPWS's projected maximum day demands, inclusive of the current and future MCWS service areas. These projections do not include water sales to Spring Hill (i.e., they exclude the current 2.88 mgd sales contract with Spring Hill). CPWS has developed projections using a range of peaking factors, but proposed using a 1.55 maximum day peaking factor, as presented in the table below.

<b>CPWS and MCWS Combined Demand and Supply Projections</b>			
Time Period	Maximum Day (gpd) at end of period using 1.55 Peaking Factor	Plant Supply 16.4 MGD WTP* plus new 8.0 MGD WTP after 2024	Deficit (-) or Surplus (+)
2018 to 2023	16,000,000	16,400,000	400,000
2024 to 2027	17,100,000	24,400,000	7,300,000
2028 to 2032	18,400,000	24,400,000	6,000,000
2033 to 2037	20,000,000	24,400,000	4,400,000

Spring Hill has a 6 mgd rated intake on the Duck River and a 4 mgd rated raw water pumping station and water treatment plant. The facilities are designed for a relatively simple expansion to 6 mgd. The following table provides Spring Hill's projected maximum day demands, using a peaking factor of 1.5, and does not include service to the new development in the MCWS service area east of Interstate 65.

<b>Spring Hill Demand and Supply Projections</b>			
Time Period	Maximum Day (gpd) at end of period using 1.5 Peaking Factor*	Plant Supply*	Deficit (-) or Surplus (+)
2018 to 2023	6,000,000	6,000,000	0
2024 to 2027	7,400,000	6,000,000	-(1,400,000)

2028 to 2032	8,700,000	6,000,000	-(2,700,000)
2033 to 2037	10,000,000	6,000,000	-(4,000,000)

\* The “deficit/surplus” calculation assumes the WTP has been expanded to 6 mgd, and the existing 2.88 mgd contract with CPWS has expired in the spring 2019.

The above table shows that Spring Hill requires 10 mgd to meet their 2037 maximum day demands, which exceeds the current intake capacity (6 mgd) and the current pumping and treatment capacities (4 mgd).

Proceeding with the anticipated expansion of the raw water pumping station and WTP to 6 mgd will satisfy projected demands through 2023. The projected 4 mgd deficit in 2037 will require expansion of the water supply to 10 mgd, or an agreement to purchase 4 mgd from CPWS.

At the December 5 meeting, CPWS announced that its current WTP was not able to produce 20 mgd and therefore must be reduced to 16.4 mgd. As a result of the “derating”, CPWS said they may not be able to deliver the existing full contracted 2.88 mgd to Spring Hill beyond 2019. CPWS indicated they would likely not be able to renew the agreement at that time, although it would seem possible to extend it at lesser amounts until they fully utilize their 16.4 mgd WTP capacity in around 2024. As a result of the Duck River Agency Water Study and intake site recommendations, CPWS is planning for a new intake at “Alexander Bend” and a new WTP nearby. CPWS has purchased 75 acres and plans to have the new intake and WTP in operation by 2024. CPWS indicated they planned to construct 8 mgd of treatment capacity for themselves and MCWS, and invited Spring Hill to financially participate in the project, saying they are open to a larger WTP (greater than 8 mgd) with the method of cost sharing yet to be determined. Presumably, CPWS would also be willing to sell water to Spring Hill, given that they would have spare capacity through 2037, even if they only construct 8 mgd.

The net effect is that due to the derating of the existing Columbia WTP, and the likelihood that CPWS will not be able to renew the water sales agreement in 2019, Spring Hill faces the need to quickly expand their WTP to exercise the full 6 mgd intake permit withdrawal allowance, and simultaneously develop a long-term strategy that relies either on purchasing water from CPWS when their new WTP is completed (2024), or securing a new permit to expand Spring Hill’s own water supply beyond 6 mgd by that same time.

*As a result, there is a need for the recommended facility plan for expanding the Spring Hill WTP to 6 mgd, while also evaluating the feasibility of securing a permit for a new withdrawal from Duck River and developing cost estimates for constructing a new intake and water treatment plant to increase the City’s water supply to 10 mgd. This construction could be completed in phases, with expansion to 8 mgd by 2024 and to 10 mgd by about 2030, if TDEC approves the withdrawal of additional water from the Duck River, based on current projections for Spring Hill (excluding a feed to MCWS for the new development).*

**PROPOSED TIMELINE**

January, 2018

1. Present updated report to BOMA on findings from the CPWS meeting on December 5, 2017, covering:

- a. CPWS's derated WTP capacity, and its impact on the City's current water purchase agreement; ability to provide water supply to Spring Hill between 2019 and 2024; impacting the original timeline to expand the city's water treatment plant set for 2027.
- b. CPWS plans to construct a second WTP by 2024 to supply an additional 8 mgd to Columbia and MCWS, recognizing that a new 8 mgd plant would also provide spare capacity to serve Spring Hill through approximately 2037.
- c. Acquire authorization from BOMA to authorize a contract extension with Dempsey, Dilling and Associates and their subconsultant O'Brien and Gere to develop a facility plan to expand the Spring Hill Water Treatment Plant (WTP) to 6 mgd.

#### February-March, 2018

1. Develop scope of work with DDA and OBG for Facility Plan for the Spring Hill WTP
  - a. Using information collected from the Water Capacity Study, examine and evaluate individual unit processes at the water treatment plant for expansion to a 6 mgd plant
  - b. Preliminary scope of services for a Facility Plan to expand Spring Hill WTP shall include:
    - i. Assess ability of existing WTP site to accommodate a larger WTP
    - ii. Identify need for treatment process upgrades
    - iii. Conduct meetings with TDEC to explore requirements for increasing withdrawal from Duck River (currently permitted for 6.0 MGD and request additional withdrawal to 10 MGD).
    - iv. Develop concept plans and costs for expansion of existing Spring Hill facilities to 6 mgd, 8 mgd and 10 mgd +/-, reflecting the projected demands for Spring Hill in 2023, 2030, and 2037, respectively.
    - v. Prepare a technical report summarizing the findings including deficiencies and project costs to upgrade the plant.
2. Examine the feasibility of providing water service to outside water service customers such as MCWS. Prepare a technical memorandum addressing the advantages and disadvantages of water service.

#### April-June 2018

1. Finalize Professional Services Agreement with DDA along with OBG as their subconsultant and present to BOMA for approval.
2. DDA/OBG initiate the above assignments and conduct progress meetings with City Management and staff to further refine the project, cost estimates, and time schedules. Provide project cost figures (Engineering, Design, and Construction Cost) to upgrade WTP to a 6 mgd facility for submission to the BOMA and City staff for FY 2018 budgeting request

#### July, 2018 through December, 2018

1. Complete the Facility Plan for 6 mgd WTP with options for expansion up to 10 mgd and conduct work sessions with City staff and BOMA
2. Conduct reclaimed water study (this may be required by TDEC)
  - a. Direct/indirect potable reuse
  - b. Use of reclaimed water for non-potable purposes to offset potable demands

#### February, 2019

1. CPWS/Spring Hill two-year water sales agreement expires (Spring Hill maximum day water demand projected to be 4.83 mgd in 2019)
  - a. Assess extending the agreement, but at a lower capacity and lower minimum purchase

March, 2019

1. Develop Strategic Plan Report for BOMA discussing and selecting one of the following options:
  - a. An agreement with CPWS for water purchases of up to 4 mgd to provide adequate water supply to 2037; or
  - b. An agreement with CPWS to construct a larger (12 mgd) regional WTP to supply water to Spring Hill in lieu of expanding the Spring Hill WTP to 10 mgd, and providing water beyond 2037; or
  - c. Further expand the Spring Hill WTP to 10 mgd for self-reliance of water supply and distribution through 2037.

Year 2019 through 2021

1. Submit completed Facility Plan for 6 mgd plant to TDEC for SRF funding.
2. Design and construct expansion of Spring Hill WTP from 4 mgd to 6 mgd, *and*
3. If Spring Hill decides to expand the Spring Hill WTP from 6 mgd to 10 mgd, develop new scope of work for design and construction including the necessary work for permitting to acquire additional water from the Duck River.
4. Receive authorization from BOMA to extend professional services for design services to expand the existing water treatment plant to 10 mgd plant.

Year 2021

1. Spring Hill WTP at 6 mgd online (Spring Hill maximum day water demand projected to be 5.46 mgd in 2021)

Year 2023

1. Spring Hill maximum day water demands projected to reach 6 mgd

DATE: February 14, 2018  
FROM: Philip Stuckert, P.E., Infrastructure Director  
SUBJECT: Water Treatment Plant Design Options

Summary:

Spring Hill 6 MGD Water Treatment Plant

In approximately 1997, Spring Hill began exploring the possibility of constructing its own treatment facilities. This consideration was based on the continued increases in water purchase rates as well as the cost to provide needed upgrades to the transmission facilities (transmission line and booster stations) required to purchase and convey additional water from Columbia to Spring Hill. Spring Hill began the long process of applying for a withdrawal permit in 1998 to determine if the Tennessee Department of Environment and Conservation (TDEC) would approve withdrawal of water from the Duck River. After submitting all required environmental studies and engineering materials, TDEC approved the withdrawal of 6.0 Million Gallons per Day (MGD) from the Duck River at river mile 166, located upstream of Carpenter's Bridge Road. The withdrawal permit #98-463 was issued in March 1999. Soon after the approval of the withdrawal permit, Spring Hill began efforts to have engineering performed for the Raw Water Intake (RWI), Raw Water Transmission Line (RWTL) and the Water Treatment Plant (WTP). As part of these engineering efforts, TDEC additionally required applying for an Aquatic Resource Alteration Permit (ARAP) to construct the RWI on the river. The requirements of this ARAP consisted of an aquatic life survey of the river bed upstream and downstream of the proposed intake site. This survey consisted of a biologist/scuba diver performing a cross-sectional inventory of aquatic life at 100-foot intervals, 1/4 mile upstream and 1/4 downstream of the proposed RWI site. A botanical study, archeological study and historical study were also required to be performed and submitted to TDEC, US Army Corp of Engineers, TN Fish and Wildlife, US Fish and Wildlife as well as coordination with TVA. Once all studies were completed and approved, engineered construction plans were submitted to TDEC for review and approval.

Spring Hill's RWI, RWTL and WTP were constructed during 2001-2003 and brought online in August 2003. The facilities were designed to meet a 20-year service life. However, these facilities have been strained during drought conditions. Additionally, the capacity of 20-years has been somewhat shortened due to past and current increased development trends in the housing market within Spring Hill. This was the reason Spring Hill entered into a purchase agreement with Columbia as to allow an additional water purchase during peak demand use and drought conditions.

Water Use Projections:

Based on work performed within the Water Capacity Study, the current water use is 2.8 MGD (average) and 4.2 MGD (peak). The peak water use projections for Spring Hill are 5.46 MGD by year 2021, 6.0 MGD by year 2023 and 10 MGD by year 2037.

Current Need:

The current WTP has the capacity to produce an average of 4.0 MGD with intermittent peak usage exceeding design capacity. Spring Hill's peak water demands are currently projected to reach 5.46 MGD by year 2021 and 6.0 MGD by year 2023. Due to the current growth within the City, there exists an immediate need for additional water. There are two options to meet this immediate need, first, is to purchase water from Columbia and, second, is to expand the current water facilities. The first option, has been dampened by the fact that Columbia has recently realized (post signing of purchase agreement with Spring Hill) that their current water

treatment capacity is not as much as they originally believed. This downsizing of their capacity was due to an evaluation of their facilities in which they discovered they do not have a 20 MGD capability but only 16.4 MGD. This in-turn will probably lead Columbia not to renew a long term contract with Spring Hill until they have upgraded their facilities. Therefore, it appears the only viable option currently available for Spring Hill is to begin planning to expand its own WTP.

#### Current Facilities Restraints

The existing pumps, electrical controls and other components located at the RWI will require upsizing in order to pump 6.0 MGD to the WTP. The existing 18-inch RWTL will more than likely accommodate conveyance of 6.0 MGD, with no additional future capacity beyond 6.0 MGD. An additional RWTL 6.5 miles in length, including boring under I-65, will be required to convey water from the RWI to the WTP for a capacity greater than 6.0 MGD.

The WTP should be able to be expanded by means of filter media replacement, to a higher rated filter such as a membrane filters rather than the existing mixed media sand and anthracite filters. The WTP improvements to 6.0 MGD will also require upsizing of tankage, pumps, valves, piping and electrical however, an expansion of the building itself should not be required. Additional large scale improvements such as building expansion, backwash solids handling, chemical feed expansion, and treatment components expansion will be required to expand beyond 6.0 MGD.

In order to expand capacity beyond the 6.0 MGD, the RWI influent pipe/screen will either need to be upsized or a dual parallel pipe installed out into the river. The RWI structure will have to be expanded in which the 60-foot deep wet well will need to be expanded accordingly to accommodate higher influent flows along with larger internal piping, expanded and upgraded electrical and controls. The upstairs building area may also need expanded at the time of increasing to 10 MGD.

#### Future Need:

The question has been raised, which is a great question, why not begin the design process to a 10 MGD rather than to 6.0 MGD? Planning for an expansion to 10 MGD will require performing all the previously listed steps and studies necessary to obtain approval from TDEC and all the other agencies which have to approve the expansion to pull additional water out of the Duck River. In addition, an ARAP will also be required to make improvements to the RWI if an additional pipe is installed in the river or an expansion to the wet well is required. These steps, studies and processes will require 18-months to 24-months, if not longer to obtain an expanded withdrawal permit. In addition, past droughts in the Middle TN area have resulted in numerous water basin shortage studies, such as the Duck River Basin Studies which have been performed to make recommendations for better management of the water resources within this particular watershed. Operations of Normandy Dam, a required 100 cubic feet per second (cfs) minimum river flow, drought management plans, environmental impact concerns as well as evaluating a regional solution to water supply needs have all been factors which have evolved since the most recent droughts. These factors will also have to be encompassed in any request to expand the RWI above its current permitted withdrawal of 6.0 MGD. To simplify, TDEC will consider all of the above studies before issuing the City of Spring Hill a new withdraw permit exceeding 6 MGD. Perhaps after reviewing all of the data, TDEC may issue Spring Hill a new withdrawal permit in a lesser amount as to meet the twenty-year use demand projections.

Expansion of the existing WTP to 6.0 MGD will allow the city to meet its immediate growth needs while also preparing to submit all necessary studies for application to increase withdrawal to 10 MGD. The design of the

existing WTP should allow for an expansion within the footprint of the current building with minimum

disturbance to existing infrastructure. Therefore, the immediate need to expand to 6.0 MGD would provide assurance the WTP could meet the needs through 2024 while preparing documents and studies required to apply for an increase of withdrawal from the Duck River to 10 MGD.

### Facility Plan

TDEC requires a FP in order to implement the proposed WTP expansion improvements. A facilities plan evaluation will determine in detail the extent of all improvements needed to expand to 6.0 MGD and ultimately to 10 MGD, if TDEC issues the City a 10 MGD withdraw permit. The current timeline proposes a FP be completed by June 2019. The next step would be to award a design contract in 2020 and then bid out the project in mid 2021, with an anticipated construction time of 18-24 months. This schedule would allow an expanded 6.0 MGD plant to be online by mid 2023.

### Options and Risk

CPWS has plans to build a second WTP at their Alexander Bend Property. It has not been determined at this time what is best financially advantageous for Spring Hill: to purchase the peak demand water from CPWS or front the initial capital outlay for their own expansion to 10 MGD. Spring Hill may not require the use of the additional water until 2037 and only then during peak demand days. The proposed FP will include an evaluation of further expansion of the plant and coordination with TDEC. When selecting components for expansion, an analysis for a potential 10 MGD plant will be considered.

Requesting to increase the withdrawal and submitting all required studies to TDEC, in addition to their review and "Public Comments Period", can be a lengthy process and involves many environmental conditions to be met. Planning for a future expansion to 10 MGD is recommended, however proceeding with design of a 10 MGD WTP at this time, prior to receiving approval to withdraw an additional 4.0 MGD from the Duck River, would be a risk. Other options for water sources should be investigated such as groundwater or other surface waters, should TDEC not approve an increase in the withdrawal permit.

There are other risks with expanding the WTP to 10 MGD prior to acquiring a permit to withdraw 10 MGD from the Duck River. The points below further outline those risk associated with designing a 10 MGD permit without acquiring permission to withdraw 10 MGD from the Duck River.

Scenario No. 1. A possible failure to meet the City's immediate need to supply its customers with a potable water supply for the maximum day usage of 2023.

Risk: The City prepares a FP under state rules, regulations and guidelines so as to acquire a permit from TDEC for construction of an expanded water treatment plant. The development of the FP documents is an iterative process allowing comments from all parties. The development of a FP also allows the city to utilize this plan when applying for a low interest loan with the State Revolving Loan Fund for construction of the WTP expansion. FP expedites the review and approval process with TDEC. The FP will address the goal and outcome to expand the city's WTP from 4 MGD to 6 MGD.

Scenario No. 2. Designing a 10 MGD Water Plant without acquiring a 10 MGD Withdraw permit from the Duck River will raise issues with TDEC.

Risk: As mentioned above, city staff recommends preparing a FP for the plant expansion to receive a permit to construct and access to low interest construction loans. This insures the city will have a WTP online to meet water demand by calendar year 2023. Failure to address the short term needs of the city by complicating the process with the parallel design of a 10 MGD WTP may raise a number of questions by TDEC. The development of the documents will require extensive meetings with TDEC. Since TDEC is aware that we have a permit to withdraw 6 MGD from the Duck River, additional environmental and hydraulic studies on the Duck River are minimized. The existing permit to withdraw 6 MGD from the Duck River will expedite the approval from TDEC to design and build the new 6 MGD plant.

Scenario No. 3. The design of a 10 MGD Water Treatment Plant will not be reviewed by TDEC since we do not have a 10 MGD withdraw permit.

Risk: If the FP addresses two plant designs, one for a 6 MGD plant and the other for a 10 MGD plant, TDEC intuitively will not take the time and effort to review the second design based on 10 MGD since the City has not addressed hydrological and environmental issues to withdraw 10 MGD from the Duck River.

Scenario No. 4. Designing the 10 MGD Plant outside TDEC's purview will risk the potential of receiving a future permit to construct and receiving SRF loan funds for construction.

Risk: If the city designs the 10 MGD WTP outside of TDEC's regulatory approval process and prior to completing a FP and associated required documents/studies established by TDEC, a permit to construct the 10 MGD WTP will not be issued. FP and associated studies for interactive discussion among each agency to address concerns and issues during design is a required process. Separating TDEC from the process presents significant risk from them not approving the construction drawings and leading to additional environmental studies on the Duck River. Therefore, the city may be delayed for months or years for failure to address these issues upfront in a proactive consultation with TDEC during the design process.

City staff believes that it is in the best course of the city to prepare a FP and associated documents to expand the plant from 4 MGD to 6 MGD. Once the FP is approved by TDEC and a permit to construct is issued by TDEC, then the City should immediately seek permission to withdraw up to 10 MGD from the Duck River. Once that permission is granted by TDEC, the City should start the process to prepare the necessary documentation to request withdraw of 10 MGD from the Duck River and to build a 10 MGD water plant. The next challenge for the city is to acquire a longer term reliable potable water supply. This may involve working with CPWS for a short period of time as we seek to acquire a permit from TDEC to withdraw a permit for the withdraw of water from the Duck River and to construct a 10 MGD water plant.