MEMO

ARCADIS Design & Consultancy for natural and built assets

To:

Robert Stahl
City of Warren, Ohio

Copies:

Ed Haller (City)
Mike Welke (City)
Dave Frank (Arcadis)
Brian Bass (Arcadis)

Arcadis U.S., Inc.
222 South Main Street
Suite 300
Akron
Ohio 44308
Tel 330 434 1995
Fax 330 374 1095

From:

John Mastracchio

Date:

November 15, 2016

Arcadis Project No.:

AK000341.R001

Subject:

Inter-Municipal Agreement Review

INTRODUCTION

The purpose of this memorandum is to document the review of the pricing provisions contained in the following inter-municipal sewer agreements:

- Master Meter Agreement between the City of Warren (City) and Trumbull County (County) for Sewer Outlet Privileges associated with the Warren-Champion and Lordstown Sewer Subdistricts, dated December 21, 1998 (herein referred to as the "Champion - Lordstown Agreement").
- Sewer Service Agreement between the City and Trumbull County for Sewer Outlet Privileges associated with the City's Howland Subdistrict No. 1 Mosquito Creek Sewer District that was signed in 1999 (herein referred to as the "Howland-Mosquito Creek Agreement").

The review of these agreements focused on the pricing provisions contained therein for the purposes of assessing their reasonableness in recovering the cost of providing service, conforming with common industry practice, and to help the City address technical issues and concerns. Based on a meeting with the City held on July 7, 2016, these concerns included:

(1) disproportionately high inflow/infiltration (I/I) originating from the Champion Sewer Subdistrict;

(2) inability to measure and charge for all wastewater flow conveyed from the Champion Sewer Subdistrict due to wet weather events exceeding the metering flume measuring capacity; - 6 times

(3) inability of the City to benefit from the large industries served by the Lordstown Sewer Subdistrict because the current cost recovery approach utilized by the City only enables them to bill the Lordstown Sewer Subdistrict at cost;

(4) rate equalization payments associated with approximately 600 City customers whose sewerage is conveyed to the County;

(5) reported inability of the County to update its sewer rate calculation associated with the Howland-Mosquito Creek Agreement because wastewater treatment plant costs cannot be separated from other costs of the system; and

(6) reasonableness of the estimate of 400 gallons per day per single resident equivalent (SRE) connection that is used as the basis for deducting County flows that are tributary to the meter pit, as specified in the Howland-Mosquito Creek Agreement.

A description of the existing agreements and the various options to address these concerns is provided in the narrative that follows, and these options are summarized in Attachment 1 provided at the end of this memorandum.

CHAMPION – LORDSTOWN AGREEMENT

The Champion-Lordstown Agreement details the provisions that have been agreed to between the City and the County for conveying and treating wastewater flows from County sewer subdistricts known as Warren-Champion and Lordstown to the City's Water Pollution Control Center (WPCC). According to the agreement, sewerage flows generated in these subdistricts are conveyed in County-owned, operated, and maintained sewer systems until being metered prior to their entry into the sewerage system owned, operated, and maintained by the City. The sewerage is then conveyed and treated at the City's WPCC.

According to the Champion-Lordstown Agreement (Agreement Paragraph 3), both the County and the City will equally share in the cost of maintaining and/or replacing any necessary or useful metering equipment to measure the volume of sewer discharged into the City's sewerage system by the County.

Pricing Provisions

The pricing provisions contained in the Champion-Lordstown Agreement are described in a series of tables provided as exhibits to the Agreement (Exhibits C and D) that identify costs that are eligible to be allocated proportionately to the City (based on wastewater flow). The Champion-Lordstown Agreement defines expenses for the Lordstown sewer subdistrict as "all Operation, Maintenance, and Replacement (OM&R) expenses (except those specifically excluded by the agreement and as noted in Exhibit D), plus one and one-half times the debt payment due on the 1959 general obligation bond issue sold to support the construction of the City's existing WPCC, plus the OWDA debt payments due on all wastewater treatment facilities under loan number 0708SW dated March 8, 1984 (agreement paragraph 16)." These debt service components of the rate expired in 1999 and 2012 respectively. The agreement also includes a provision that allows for sharing of additional capital costs if they are incurred. The agreement states that "Any projects involving the addition to, or capital expansion of, the existing treatment works, which provide additional benefit to sewer users will be reviewed to determine that portion of costs (OM&R) that will be borne by the County."

Exhibit C (and Exhibit C Supplemental) of the Champion-Lordstown Agreement specifies that OM&R expenses for Warren-Champion and Lordstown sewer subdistrict consists of the following:

1. All accounts from Fund 450 703 and a portion of Fund 450 704 benefiting the County.
2. Less contractual items: utility billing, sewer rental, and debt service.
3. Less negotiated items, specified as:
    a. Electrical expenses for remote pump stations that do not transport flow generated from master meter areas;
    b. Consultant fees, equipment maintenance, supplies, purchases, and personnel-related costs associated with remote pump stations;
    c. Expenses from Mayor's office, Civil Service, Administrative Support, and 50% of Engineering Fees;
    d. Pre-treatment lab fees;
    e. Equipment maintenance and purchases;
    f. Sewer maintenance personnel and supplies associated with sewer lines that do not carry County sewer flow (98% of these expenses). This percentage was determined based on the ratio of sewer lines used by the County versus the total sewer lines maintained;
    g. Expenses related to septage hauled sludge; and
    h. Equalization costs, i.e., an expense to the City for reimbursement of the difference between County and City sewer rates for customers of the City that live in the City but whose wastewater is conveyed to the County for treatment.
4. Less City pump station expenses (electricity, maintenance, and equipment costs).

It is understood that the allocation of OM&R expenses described above were established as a result of a past arbitration proceeding that occurred involving the City and the County.

The Champion-Lordstown Agreement defines expenses for the Warren-Champion sewer subdistrict as "all expenses as defined above for the Lordstown sewer subdistrict plus one and one-half times the debt payment due on the 1961 mortgage revenue bond sold to support construction of various sewerage improvements (Agreement Paragraph 16)." Operation and maintenance expenses are defined as "those expenses required to maintain an existing state or to efficiently preserve from failure or decline the existing state and all agreed upon administration and engineering expenses attributable to operation and maintenance, but excluding debt service, and further excluding capital improvements as provided for from the Capital Asset Replacement Fund (Agreement Paragraph 17)." Exhibit C (and Exhibit C Supplemental) of the Agreement specifies that OM&R expenses for the Warren-Champion sewer subdistrict consists of the same OM&R expenses as defined for the Lordstown sewer subdistrict, except that it includes expenses associated with the Main Pump Station because the flow generated from Champion passes through the Main Pump Station en route to the WPCC.

These eligible costs are used in determining the sewer rates charged by the City to the County. The City determines the rates by calculating the average cost per million gallons of wastewater treated for the previous two calendar years (Agreement Paragraph 12). Also, the Champion-Lordstown Agreement (at Paragraph 16) specifies that any excess OM&R costs shall, at the option of the City, be held by the City for use in meeting future OM&R expenses or shall be assigned to fund, or partially fund, capital improvement projects which will benefit all users of the City's sewerage system, including the City's collection system utilized by the County. The Champion-Lordstown Agreement also specifies that the City can establish a Capital Asset Replacement Fund for the purposes of replacement of major items costing

more than $50,000 at the City's WPCC, and specifies that each party will contribute to the fund in proportion to its flow into the WPCC.

The Champion-Lordstown Agreement includes a true-up provision (see Agreement Paragraph 13), which states that "any adjustment to the actual annual cost of treatment (cost per million gallons) not equaling the previous two year's cost shall be made as part of the March invoicing as a credit or additional charge."

The City bills the County on a monthly basis for the OM&R based on the established cost per million gallons (Agreement Paragraph 15).

Discussion, Analysis, and Recommendations

Determining Revenue Requirements

The pricing provision of the Champion-Lordstown Agreement sets forth the revenue requirements associated with the Warren-Champion and Lordstown sewer subdistricts on a cash needs basis, with costs attributable to each sewer subdistrict determined based on the proportion of the system utilized by each sewer subdistrict. In general, this is a common industry approach for assigning costs to system users based on system use and in proportion to average flow. The cash needs approach involves less technical complexity than other approaches, such as the utility basis approach, and therefore costs relatively less for associated rate studies, maintenance of records, and rate-updates.

An important element of determining outside-city customer costs is understanding and recognizing the facilities needed to serve these customers. These may vary based on the level of service for the conveyance and treatment of wastewater, along with the geographic location of the outside-city customers. In addition, specific investments in facilities dedicated to serving these outside-city customers may need to be made. Recognizing the facilities serving these customers while equitably and fairly distributing the associated costs is often challenging. Given the configuration of the City's wastewater collection and treatment system, we understand that the wastewater from Champion enters the City's collection system at the beginning of the Mahoning Interceptor and is conveyed via this interceptor directly to the Main Pump Station, and no portion passes through the remote pump stations in the collection system. In instances where outside-jurisdictional customers are served by a discrete portion of the system, it is common for these customers to only pay for the portion of the system that they utilize (an example is the contractual arrangement between Capital Region Water and Steelton Township in Pennsylvania – See Attachment 2). However, this is not a universal practice. In other inter-jurisdictional agreements, outside city customers pay a proportionate share of the system costs regardless of the specific wastewater assets that are utilized (the agreements between the City of Columbus and suburban customers are examples – See Attachment 2). Because there is no universal approach, the City could establish an agreement with Champion where Champion pays for a proportion of the cost of all the pump stations in the system, regardless of their location. This approach would treat Champion in much the same manner as a City retail customer that only utilizes a portion of the collection and pumping system. If the City decides to take this approach, it could modify the negotiated items that are excluded from the Champion rate calculation, namely the City could consider including items 3a, 3b, 3e, and 3f in the rate calculation for Champion.

Furthermore, the cost recovery approach utilized in the Champion-Lordstown Agreement has several shortcomings. It does not provide for the sharing of costs associated with peak day demands of City and County sewer subdistricts due to differences in inflow/infiltration (I/I), which may vary and not be proportional to average flows from sewer subdistricts. It also does not allow for the City to earn a return

above cash basis costs from outside-city customers. There are several alternatives that the City could consider to address these shortcomings.

Regarding earning a rate of return from outside-city customers, a government-owned utility is considered to be the property of the citizens of the City and, as owners of the utility, bear the risks and responsibilities of utility ownership. Inside-city customers cannot withdraw from the utility, and the utility has a responsibility to develop the system to serve all retail customers within its jurisdictional boundaries as well as others that they are contractually obligated to serve. Although the City's risks in providing wastewater service to outside-city customers may be mitigated based on the provisions of the service agreement between the parties, outside-city customers may have the ability and option to look to other entities to provide wastewater service, or may have the option to develop their own wastewater systems, which could result in stranded investments and costs to the inside-city utility. The nature of the service to outside-city customers introduces business, interest rate, financial, liquidity, and regulatory risk to the City that is not explicitly compensated under the cash needs approach currently used by the City. The compensation for these risk factors through an established equity rate of return is a way to justify a rate differential between inside-city and outside-city customers.

An alternative approach to determining the revenue requirements of the system that are attributable to the County, such as the utility basis approach, could be considered. The utility basis approach is often used to set rates for outside customers, and in some jurisdictions, this approach is required. The utility basis approach for determining revenue requirements consist of O&M expenses, depreciation expense, and a "fair" return on rate base investment. While the utility basis approach is in some ways similar to the cash-needs approach, where these two methods diverge is in how capital infrastructure is funded within the rates. The cash needs approach utilizes debt service and capital expenditures funded from rates. In contrast to this, the utility basis approach uses depreciation expense and a return on rate base. The return on rate base is often calculated using a weighted average of the cost of debt and equity, with the return on equity established to reflect the risk of serving outside jurisdictional customers. This approach tends to be more complicated than the cash-needs approach with greater data requirements and administrative complexity. Therefore, given the City's desire to simplify the pricing provisions in the Champion-Lordstown Agreement, this approach may not be the best fit for the City.

Alternatively, some utilities have simply applied a multiplier to the retail rate schedule for inside customers to establish the rates applicable to outside customers (e.g., inside customer rate × 1.25 multiplier = outside customer rate). The agreements established between the City of Columbus and suburban customers, and the City of Dayton and Montgomery County are examples (see Attachment 2 for details). By definition, the use of arbitrary multipliers to determine outside-city customer rates does not conform to cost-based, rate-making practices. However, it is possible to establish a rate differential based upon cost-based principles and cost allocations that fairly reflect the relationship between the parties. The application of multipliers in determining outside customer rates is therefore not, in and of itself, indicative of the use of a non-cost-based, rate-setting approach. Justifications often cited for using a "multiplier" approach to establish rate differentials between inside and outside customers are historical precedent, simplicity, and lower administrative burden than other approaches. The City may want to consider this multiplier approach to recovery of operating expenses incurred to serve the County's sewer subdistricts. If so, then it is suggested that a detailed cost of service evaluation be completed to determine the cost justified rates for the County subdistricts, and then compare these rates to the City's retail rates to establish the rate multiplier to utilize going forward. If this approach is used, then we suggest that the rate multipliers be validated periodically to confirm their validity (say every five years).

Peak Flow Rate Provisions

Properly developed cost-based rates are designed to equitably allocate costs based on relative contributions to system demands (consumption) and peak-use events (e.g., maximum day or maximum monthly demands). Furthermore, there are some agreements that specify allowable peak flow rates (peak hour, day or month) from master meter customers that are typically related to the ratio of wastewater treatment plant or collection system peak rated capacity as compared to average annual flow or capacity. Peak flows from master meter customers (or sewer subdistricts) that exceed these allowable peak flow rates are assessed a surcharge for utilizing the additional conveyance and plant infrastructure. Often these agreements charge the excess flow at a rate that is a multiple of the base volumetric rate. The City could consider including such a surcharge for excess wastewater flows from the Warren-Champion and Lordstown sewer subdistricts. An example of such as surcharge approach has been incorporated into the wastewater service agreement between the Williamsport Sanitary Authority and Loyalsock Township in Pennsylvania (See Attachment 2 for details).

We understand that the City has adopted a Stormwater Surcharge for Satellite Systems (Ordinance 935.052). Under this ordinance, a monthly wet weather surcharge is calculated for infiltration that exceeds an allowance of no more than 200 gallons/inch sewer diameter/day/mile for all existing sewers. The surcharge is an additional thirty-three percent (33%) of the current rate per million gallons. Incorporation of this provision into the Champion-Lordstown Agreement would provide an incentive for the Warren-Champion and Lordstown sewer subdistricts to address their I/I issues.

Inaccuracy in Wastewater Flow Metering

At the project kickoff meeting, the City expressed concern over the inaccuracy of sewer flow metering from the Champion Sewer Subdistrict due to an undersized flow meter that results in under-recovery of costs by the City from this sewer subdistrict. Based on information provided by the City, the existing metering arrangement includes a Leopold-Lagco metering flume with 24-inch throat installed in a manhole on the County's section of 36-inch diameter sewer. The flowing water depth is measured by an ultrasonic level device and the flow is calculated from this level based on the established flume geometry. This form of flow metering is a well-established approach for gravity wastewater flows and, with a properly calibrated level measurement device, provides accurate and repeatable measurement. The 24-inch throat flume is capable of accurately measuring flows up to approximately 5.1 million gallons per day (mgd).

A major concern with the metering arrangement stems from City observations of surcharging of the metering manhole during wet weather events. If the manhole is surcharging then the wastewater flow depth is greatly exceeding the measurement height within the metering flume throat – wastewater levels above the throat, and overall flume insert, are not measured by the level sensor because they cannot be converted to a representative flow value, i.e. flow above the flume throat is not correctly measured or reported.

The city provided several drawings for the City's 42-inch diameter trunk sewer which is downstream of the County's 36-inch trunk sewer, and County sewer atlases in the area of the 36-inch trunk sewer. An April 2016 report titled "Champion Flow Meter Comparison Report" prepared by AECOM was also provided, in addition to a sampling of flow meter output data. Based on information contained in these documents the following is noted:

1. The County's 36-inch trunk sewer was constructed with a 0.40% slope upstream of the meter manhole, and a 0.24% slope downstream of the meter manhole. Based on these slopes and an assumed Manning's Equation "n" = 0.013, the approximate conveyance capacity of the 36-inch

sewer is 27 mgd upstream of the meter and 21 mgd downstream of the meter. Thus, the sewer conveyance capacity significantly exceeds metering capability.

2. The County's 36-inch trunk sewer discharges into the City's 42-inch Mahoning River Interceptor approximately 1,500 lineal feet downstream of the meter manhole. The Interceptor is laid at a 0.074% slope for at least the first 2,200 lineal feet downstream of the County trunk sewer connection. At this slope, and a Manning's "n" = 0.013, the Interceptor capacity is approximately 18 mgd. At the point of discharge of the County trunk sewer to the Interceptor another city sewer (Northwest Sewer) also discharges. The Northwest Sewer is 27-inch diameter laid at 0.18% slope yielding a conveyance capacity of approximately 8.5 mgd. Together, the County trunk sewer and the City's Northwest Sewer combined capacity is approximately 30 mgd, which greatly exceeds the 18 mgd Interceptor capacity.
3. The Champion Flow Meter Comparison Report presents only daily flow totals – it does not indicate what resolution of data was collected. If higher resolution data is available from this Report effort, it could be further evaluated to begin assessing what peak flow rates occur during wet weather at the Champion meter location.
4. The flow meter appears to be programmed to output values rounded to the nearest 1,000 gallons. If the monthly accumulated total of actual values is considered for billing purposes there would be little concern that this total value is rounded to the nearest 1,000 gallons (out of approximately 26 million gallons per month). However, if the data is managed at a 15-minute increment and those rounded totals are added together to sum to a monthly value, then further review may be considered as this could result in significant variance, either positive or negative.
5. The provided sewer atlases and maps are unclear as to the exact location of a 36-inch sewer that discharges from the east into the County 36-inch trunk sewer near the meter manhole. If this connection is too close to the meter location it could impact flow measurement.
6. The City and County entered into an agreement in May 1968 for the County trunk sewer connection. The Agreement, Section 2, last paragraph reads "…the meter vault and wastewater meter shall become the property of the City, and shall be operated and maintained by the City." Based on this language the City would appear to have the right to modify the metering facility as needed.

It is important to accurately measure all wastewater flow at this master meter location not only to produce reasonable billing charges but also for an understanding of the ongoing conditions of the sewage collection system. This is especially valid because some upstream trunk sewer sections lay beneath a river providing an opportunity for I/I from the river water through deteriorated pipe joints or collapsed pipe sections. Based on this limited review it appears that peak flows tributary to the meter from the County trunk sewer exceed the metering flume capacity resulting in these flows not being measured nor captured for billing purposes. It seems appropriate to consider one or more of the following: 1) perform additional review of AECOM collected flow data to assess peak flow rates; plan and perform additional flow monitoring to augment this data and predict peak rates for a selected design condition; 2) reconstruct the metering manhole with an appropriate configuration to measure predicted peak flows, if possible (Note that it is just as important to ensure low flow accuracy is maintained with any change so as not to have under-reporting of the base flow), and/or 3) pursue methods to reduce I/I in the upstream sewage collection system in order that the existing metering capacity is adequate. In general, and based on a general understanding of the peak to average flow ratio at this location, Item 3 should be pursued to some degree regardless.

HOWLAND-MOSQUITO CREEK AGREEMENT

The Howland-Mosquito Creek Agreement provides the provisions that have been agreed to between the City and the County for the County conveying and treating wastewater flows from the City's former Howland Sewer Subdistrict No.1. Under the Howland-Mosquito Creek Agreement, the County has agreed to accept and receive into its sewer system, and will treat and dispose of sewage from within the areas of the City known as the former Howland Sewer Subdistrict No.1.

Both the County and the City will equally share in the cost of maintaining and/or replacing any necessary or useful metering equipment to measure the volume of sewer discharged into the County's sewerage system by the City. A portion of sewerage flow measured at the metering location is from County users. A reduction of 400 gallons per day per single residential equivalent (SRE) is made from the daily volume of measured sewerage flow for County users tributary to the meter pit. The Howland-Mosquito Creek Agreement states that there are 83 SREs that contribute wastewater that is measured at the metering location.

Pricing Provisions

The pricing provisions contained in the Howland-Mosquito Creek Agreement are described in a series of tables provided as an Exhibit to the Agreement (Exhibit C). In general, the costs that are eligible to be allocated proportionately to the City (based on wastewater flow) include the following:

1. OM&R expenses for Mosquito Creek Wastewater Treatment Plant
2. Debt Service for Mosquito Creek Wastewater Treatment Plant
3. Administrative costs: leases and rentals, court costs, judgments, refunds and reimbursements, legal, and management wages

These eligible costs are used in determining the sewer rates charged by the County to the City. The County determines the rates by calculating the average cost per million gallons of wastewater treated for the previous two calendar years. Also, the Howland-Mosquito Creek Agreement (Paragraph 17) specifies that any excess OM&R costs shall, at the option of the County, be held by the County for use in meeting future OM&R expenses or shall be assigned to fund, or partially fund, capital improvement projects which will benefit all users of the County's sewerage system, including the County's collection system utilized by the City.

The Howland-Mosquito Creek Agreement includes a true-up provision (see Agreement Paragraph 14), which states that "any adjustment to the actual annual cost of treatment (cost per million gallons) not equaling the previous two year's cost shall be made as part of the March invoicing as a credit or additional charge."

The County shall bill the City on a monthly basis for the operations, maintenance, and repair of the County's Mosquito Creek Wastewater Treatment Plant based on the established cost per million gallons (Agreement Paragraph 16).

Discussion, Analysis, and Recommendations

Determining Revenue Requirements

The City is concerned with the reported inability of the County to update its sewer rate calculation associated with the Howland-Mosquito Creek Agreement because the County states that wastewater

treatment plant costs cannot be separated from other costs of the system. While the County may no longer separate their treatment costs and budget as a separate sub department within their budgeting and accounting structure, these treatment costs could be estimated by completing a cost of service evaluation where total treatment costs are analyzed and relevant treatment related costs for the system broken out in a cost of service evaluation. This type of analysis is usually completed by the utility that owns the system as they have the detailed knowledge of their system configuration and costs.

Furthermore, because a cost of service evaluation to estimate and breakout relevant costs is a time consuming effort, the County could utilize the multiplier approach described previously to simplify the rate setting process. Under the multiplier approach, a multiplier to the retail rate schedule for inside customers is used to establish the rates applicable to outside customers (e.g., inside customer rate × 1.25 multiplier = outside customer rate). The City of Dayton and Montgomery County sewer agreement uses such an approach (see Attachment 2 for details). In order to implement such an approach, it is suggested that a detailed cost of service evaluation be completed to determine the cost justified rates for the City's Mosquito Creek subdistricts, and then compare these rates to the County's retail rates to establish the rate multiplier to utilize going forward. If this approach is used, then we suggest that the rate multipliers be validated periodically to confirm their validity (say every five years).

In addition, we understand that the County will be making significant capital investments in their wastewater system in near the future that could benefit City customers. Similar to the handling of debt service in the existing Howland-Mosquito Creek Agreement, the sharing of the capital costs of the wastewater system could be handled in the future by specifying that the capital improvements benefiting both the City and County customers could be shared on an average flow basis, less any accumulated excess OM&R funds or funds accumulated in the Capital Asset Replacement Fund. Provisions could also be added for the sharing of costs on the basis of proportional peak flow capacity utilization for capital projects that expand wastewater capacity. The sewer agreement between the City of Wilmington, DE and New Castle County, DE, as well as the agreement between the Williamsport Sanitary Authority and Loyalsock, PA utilize such an approach (See Attachment 2 for details).

Flow Estimation

The Howland-Mosquito Creek Agreement contains a provision where the flow from County residents is estimated and subtracted from the metered wastewater flow from the City. The Agreement includes an estimate of 400 gallons per day per SRE connection that is used as the basis for deducting County flows that are tributary to the meter pit.

It is recommended that the estimate of 400 gallons per day per SRE be validated with existing flow data because average flow rates from typical properties within the service area may have changed since this estimate was first established. In order to accomplish this, the City should consider using average winter consumption (AWC) from the specific customers whose flow is estimated as a proxy for wastewater flow, or a representative sample of other residential customers if the specific customer data for the customers whose flows are estimated is not available. Using AWC as a proxy for wastewater flows is a common industry practice. As such, the estimate of AWC can be made and compared with the 400 gallons per day per SRE figure included in the Agreement. The City and County should also consider changing the Howland-Mosquito Creek Agreement from "400 gallons per day per SRE" to "the number of gallons per day per SRE estimated based on the AWC for a representative sample of residential customers within the existing service area." It is also recommended that the County validate that 83 SREs contribute wastewater flow to the metering location as stated in the Howland-Mosquito Creek Agreement, and adjust the number of SREs as appropriate.

Rate Equalization

The City is concerned about rate equalization payments associated with approximately 600 City customers whose sewerage is conveyed to the County. These customers are charged City rates, and corresponding flow data is transmitted to the County. The County then charges the City a retail rate for conveying and treating the wastewater flows from these customers. The gross invoiced amount is approximately $30,000 per month. The difference in cost is not passed along to these customers, but is assumed by the City. According to the agreement between the City and the County regarding rate equalization, this billing approach was established because these customers were not covered under any other inter-municipal service agreement.

One solution to this issue is to modify the City agreements with the County so that these customers are included in the inter-municipal agreements. The City indicated that this modification would require City Council action to nullify the rate equalization agreement. If achievable, this would result in the County pricing wastewater service consistent with how other customers in the Howland-Mosquito Creek Agreement are handled and the rates charged would be more reflective of the cost of serving these customers. It should be noted that these costs may increase from their current state as the County's cost of service is currently unknown.

NEXT STEPS

The next steps to addressing the City's agreement concerns are to (1) identify which options the City is most interested in including in the revisions to the Agreements, and (2) prepare draft agreements that incorporate these options and pricing provision changes. To help facilitate the City's consideration and selection of options, we have provided a summary of the pricing provisions of other inter-municipal sewer agreements in the region (Attachment 1), and a list of the advantages and disadvantages of the current and alternative agreement options presented throughout this memorandum for the Champion-Lordstown and Howland-Mosquito Creek Agreements (Attachment 3). Arcadis is available to further discuss these options with you at your discretion and convenience and, can continue to support the City with the next steps in the development of updated agreements.

Attachment 1 - Pricing Provisions From Other Wastewater Service Agreements

Owner	Customers	Type of Service Provided	Pricing Arrangement
Medium Sized Ohio City #1	Master Meter Customers	Wholesale wastewater conveyance and treatment	Customers are charged based on a proportional share of flow, BOD, and TSS. Maximum volumes established with penalties for customers who discharge wasteater above the limits specified in the agreement.
City of Lorain	Sheffield Lake	Wholesale wastewater conveyance and treatment services. Collection lines owned and maintained by neighboring city.	Sewer service fee of $1.50 per 1,000 gallons, adjusted annual to reflect the operation, maintenance, and repair costs incurred for treating wastewater from the neighboring city. This rate is lower than the Inside-City rate, which is currently $6.01/100 cubic feet because it is wholesale service, not retail.
City of Canton	Stark County	Wholesale wastewater conveyance and treatment services.	Agreement limits the infiltration into the system at 500 gallones per inch diameter mile of pipe per day. Volume charge computed by dividing the County flow by the total flow of users connected to the system. County's share of the system cost specified at 49% based on average daily loading at the plant.
Capital Region Water (Harrisburg, PA)	Lycoming and Steelton Twps	Wholesale wastewater conveyance and treatment services.	CRW separates wastewater costs into treatment, conveyance, and collection components. Suburban customers pay for the the cost of service based on the portion of the wastewater system that they utilize. For example, Steelton flows are conveyed through a dedicated conveyance line owned and operated by Steelton. Therefore, they only pay their share of the treatment costs.
City of Columbus, OH	Suburban Customers	Retail Wastewater collection, conveyance, and treatment	City charges suburban customers a rate multiplier of approximately 1.08x the rates charged to inside-city customers for retail wastewater service, including collection system operation and maintenance. This multiplier rate is cost justified periodically with a cost of service evaluation.
City of Dayton, OH	Montgomery County, OH	Retail and wholesale wastewater service	City charges County customers a rate multiplier of the rates charged to inside-city customers. The rate multiplier is 1.5x for master meter customers, and either 1.25x or 1.15x for retail meters, depending on the customer. Parties are currently negotiating agreement and considering moving to a utility basis cost of service approach.
Summit County, OH	Portage County, OH	Wholesale wastewater treatment services	Summit County charges Portage 25% of capital costs of the system based on the established capacity share of the WWTP. At no time shall Portage County exceed its contractual capacity share. Portage County also pays a proportionate share of O&M cost of the system based on actual wastewater flow.
City of Wilmington, DE	New Castle County, DE	Wholesale wastewater treatment and conveyance service	City charges County a wholesale O&M rate based on the County's proportional share of water consumption and I/I in the system. I/I proportioned based on the number of retail customer accounts and the amount of billed water consumption. Capital costs are shared based on an established capacity allocation. The parties are currently negotiating a new treatment agreement.
Williamsport Sanitary Authority, PA	Loyalsock TWP, PA	Wholesale wastewater conveyance and treatment	Agreement establishes average and peak flow and loadings limitations. Twps pay capital costs based on these established capacities. 100% to 300% penalties are assessed for exceeding flow and loadings capacities. O&M costs shared proportionally based on metered wastewater flow.

Attachment 2 - Example Wastewater Service Agreements

(These documents are provided separately on a Flash Drive due to their length.)

Attachment No.	Owner	Customers
2A	Medium Sized Ohio City #1	Master Meter Customers
2B	City of Lorain	Sheffield Lake
2C	City of Canton	Stark County
2D	Capital Region Water (Harrisburg, PA)	Lycoming and Steelton Twps
2E	City of Dayton, OH	Montgomery County, OH
2F	Summit County, OH	Portage County, OH
2G	City of Wilmington, DE	New Castle County, DE
2H	Williamsport Sanitary Authority, PA	Loyalsock TWP, PA

Attachment 3 - Pricing Provision Options for New Inter-Municipal Agreement

No.	Issue	Agreement Option	Description	Advantages	Disadvantages
1a.	Inability to benefit from industries served by the Lordstown District	Pricing and cost recovery on a cash basis.	The cash basis approach is the same as used in the existing agreement where cash operation and maintenance, and capital (debt service) costs are recovered, but there is no compensation for risk in serving outside-city customers.	Simplicity, relatively easy to understand.	Inability to recover non-cash costs, such as the use of the City's bonding capacity, and compensate for risks, such as the risk of stranded asset cost.
1b.	Inability to benefit from industries served by the Lordstown District	Pricing and cost recovery on a utility basis.	The utility basis approach for determining revenue requirements consist of O&M expenses, depreciation expense, and a "fair" return on rate base investment.	It would allow the City to be compensated for risk of serving outside-city customers.	It tends to be more complicated than the cash-needs approach with greater data requirements and administrative complexity. More sophisticated and harder to understand.
1c.	Inability to benefit from industries served by the Lordstown District	Add a management fee on top of the costs allocated to the Lordstown District.	Keep the same approach of allocation of costs (under cash basis), but add a management fee to compensate for risk.	Keeps the relative simplicity of the existing approach but also allows for compensation of risk.	Not aligned with standard cost of service estimates based on rate methodologies.
2a.	Fairness of Champion-Lordstown Cost Allocation	Keep all cost adjustments in new agreement.	Current approach.	None	Does not improve equity between City and County customers.
2b.	Fairness of Champion-Lordstown Cost Allocation	Revise negotiated cost adjustments for Champion to improve equitability of cost recovery.	Eliminate the exclusion of 98% of sewer maintenance expenses and pump station-related expenses from the Champion rate calculation based on Champion's use of the City's conveyance and collection system.	More fairly allocates costs to all customers in the system. Prevents City customers from having to pay for a proportion of costs incurred to serve customers in Champion.	None.
3a.	Concern over the complexity of the rate calculation	Cost of Service Allocation Completed Annually	Current approach.	Annual rate calculations reflect changes in annual costs.	Relatively complex allocation process required to be completed annually.
3b.	Concern over the complexity of the rate calculation	Multiplier Approach with Periodic cost of service reviews	Establish a rate multiplierl based upon cost-based principles and cost allocations that fairly reflect the relationship between the parties, update rate multiplier only periodically (say every 5 years), based on a detailed cost of service evaluation.	Allows City to perform detailed cost allocations for establishing District rates on a less frequent basis.	A detailed cost of service evaluation would still need to be completed to determine the cost justified rates for the County subdistricts (although on a less frequent basis), and then compared to the City's retail rates.
4a.	Disproportionately high I/I from the Champion Sewer Subdistrict	Pricing based on average flow	Current approach.	Simplicity	Does not reflect the differences in I/I flow contributions between the City and the County in the rates that are established.
4b.	Disproportionately high I/I from the Champion Sewer Subdistrict	Pricing based on average and peak flow	Specify an allowable peak flow in the agreement based on the ratio of wastewater treatment plant peak rated capacity as compared to average annual flow, and peak flows that exceed these allowable capacity shares would result in an adjustment to the cost allocation to City and County customers.	Would better reflect City and County use of the capacity of the treatment system.	Adds complexicity to the pricing provisions and the rate calcuations.
4c.	Disproportionately high I/I from the Champion Sewer Subdistrict	Pricing based on average flow, but add a surcharge or penalty for exceeding allowable flow limits.	Add Stormwater Surcharge for Satellite Systems, Ordinance 935.052 to the agreement that allows for a surcharge of an additional 33% per 1,000 gallons for I/I that exceeds 200 gallons/inch sewer diameter/day/mile.	Would better reflect City and County use of the capacity of the treatment system.	Adds complexicity to the pricing provisions and the rate calcuations.

Attachment 3 - Pricing Provision Options for New Inter-Municipal Agreement

No.	Issue	Agreement Option	Description	Advantages	Disadvantages
5a.	Inaccuracy of Champion Wastewater Flow Meter	Extraneous flows not billed	Current approach.	None	Under-recovery of costs by the City from this sewer subdistrict.
5b.	Inaccuracy of Champion Wastewater Flow Meter	Complete review to determine the limiting trunk sewer capacities upstream and downstream of the meter, assess what maximum gravity flow rate could reach the meter, and whether the downstream sewer capacity would accommodate that flow rate	Depending on a review: 1) reconstruct the metering manhole with an appropriate configuration to measure anticipated peak flows, and/or 2) modify downstream sewers to accommodate the anticipated peak flow	Measure all wastewater flow at this master meter location to produce accurate billing charges.	Initial capital cost to construct the improvements.
6a.	Accuracy of 400 gpd flow estimate and number of SREs for County customers in Howland-Mosquito Creek Agreement	Continue to use 400 gpd and 83 SREs	Current approach.	None	Use of potentially outdated information for rate calculations.
6b.	Accuracy of 400 gpd flow estimate and number of SREs for County customers in Howland-Mosquito Creek Agreement	Use actual flows billed for these customers during the winter months as the basis for flow estimates. Update SRE count.	Change language in Agreement from "400 gallons per day per SRE" to "the number of gallons per day based on actual consumption for these residential customers within the existing service area."	Improved accuracy.	Option limited by the ability to identify customers and their billing data.
6c.	Accuracy of 400 gpd flow estimate and number of SREs for County customers in Howland-Mosquito Creek Agreement	Use actual flows for a representative sample of residential customers billed during the winter months as the basis for flow estimates.	Change language in Agreement from "400 gallons per day per SRE" to "the number of gallons per day per SRE estimated based on the average winter consumption (AWC) for a representative sample of residential customers within the existing service area."	Improved accuracy. This is an opiton if the actual billed flows from the SREs cannot be identified.	City would need to produce a set of winter bills from a representative sample of residential customers so that an AWC estimate can be made.
7a.	Rate equalization payments	Keep same approach	Approximately 600 City customers have sewerage conveyed to the County. These customers are charged City rates, and corresponding flow data is transmitted to the County. Then the County charges the City a retail rate. The difference in cost is not passed along to these customers, but is assumed by the City.	None	City is paying retail rate for these customers even though these customers are not receiving retail service.
7b.	Rate equalization payments	Incorporate rate equalization customers into new agreement and change to pricing provisions to a wholesale charge.	Provisions could be added to a new agreement incorporating these particular customers under the agreement so that they are not charged a retail rate by the County.	Improved rate equity.	None