June 8, 2018

City of Hollywood
Department of Public Utilities
1621 N. 14th Ave.
Hollywood, FL 33022-9045

Attention: Steve Joseph, PE

Subject: Cityworks Implementation for Department of Public Utilities – Phase I

Thank you for the opportunity to develop this scope of work (SOW) to support the City of Hollywood's (City) Department of Public Utilities (Department) with the implementation of Cityworks, Phase I, in support of its asset management efforts. The SOW presented below comprises the fundamental tasks discussed with Department staff that should be performed for the Phase I implementation of Cityworks within the Department. However, Phase I system design will include a focus on the planned Phase II implementation for citywide access from multiple City departments.

Phase II of the Cityworks implementation will include a citywide implementation to include other City's departments. Phase II SOW will be further discussed with the City and work will be performed under a separate Work Order.

PROJECT BACKGROUND

To more effectively and efficiently manage its water and wastewater utility infrastructure as part of an overarching asset management program, the Department is seeking assistance to implement a new Computerized Maintenance Management System (CMMS). The benefits of implementing a modernized CMMS solution may include:

- **Increased Level of Maintenance Information.** A major benefit of an effective CMMS solution comes from developing the historical database that becomes readily available as critical maintenance information is used. An effective system helps turn that data into information that can be used to manage maintenance as a business.

- **Improved Work and Service Request Control**. The work order and service request modules are the heart of a CMMS, providing the basis for work management, cost tracking, equipment history, and performance reporting.

- **Improved Planning and Scheduling**. An effective CMMS provides the systems and procedures to establish a more effective day-to-day maintenance planning and scheduling function, which is a key contributor to improved craft labor utilization and customer service.

- **Extend Equipment Life**. Automatic scheduling of repetitive preventive maintenance (PM) activities is possible through a well implemented CMMS solution. PM tasks and inspection frequencies can be documented on the PM module and failure trends monitored in order to highlight major causes of equipment breakdowns and unscheduled repairs.

- **Improved Reliability / Reduced Downtime**. A properly implemented and utilized CMMS provides the means to track work order and equipment history data related to types of repairs, frequencies, and causes for failure. It allows maintenance to have key information on failure trends that leads to eliminating root causes of failures and improving overall equipment reliability.

- **Increased Capability to Measure Performance**. A CMMS solution provides a vast source of maintenance information to allow more effective measurement of maintenance performance and service. Effective CMMS solutions enable the establishment of internal benchmarks to provide measurement of improvements in such areas as craft labor productivity, PM compliance, downtime, store inventory control, backlog, service level, and reliability.

- **Optimize Inventory Usage / Eliminate Stockouts**. Well-organized stockrooms with accurate inventory records, a stock locator system, stock levels, and a storeroom catalog can significantly improve the overall maintenance operation. A CMMS solution working in concert with an existing inventory management solution (or providing one of its own) provides for more effective management and control of parts and material inventories. Information for decisions on inventory reduction is readily available to identify parts usage, excess inventory levels, and obsolete parts.

There are several potential CMMS solutions utilized in a wide variety of industries that are available for implementation. The Department has identified several key requirements for the eventual CMMS solution including:

- **Water/Wastewater Industry Focus.** CMMS solutions are utilized in a variety of industries – manufacturing, pharmaceuticals, public works, and public utilities to name a few. However, to effectively support water/wastewater operations, the selected solution must support unique industry specific functions such as water line flushing, valve exercising, and CCTV inspections.

- **GIS Integration.** The water distribution and wastewater collection systems represent distributed assets (assets that are spread geographically over a large area). The best way to represent and work with distributed assets is via a map-based CMMS tool. In addition, the Department has already made an extensive investment in development of an enterprise Geographic Information System (GIS). An effective and sustainable integration with GIS will be important for a successful CMMS implementation for the Department.

- **Configurability.** A key success factor for an effective CMMS solution is the ability of Department staff to adapt to and utilize the system. Therefore, a system that can be configured, without vendor customization, to support existing work processes and procedures will be key to making the system as usable as possible for existing staff.

- **Open Architecture.** To meet the asset management program goals of the Department, the system will be required to be integrated with other key Department information systems over time including Finance and HR, Utility Billing, and SCADA. A solution that provides tools to enable system integrations while providing an open data model will be important to achieving these goals.

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Based on the above goals and requirements, the Department and Black & Veatch have reviewed potential solutions and recommended the acquisition and implementation of Cityworks Server Asset Management Solution (AMS). As the highest rated CMMS solution in the *2012 Comparative Review of Municipal Maintenance and Infrastructure Asset Management Systems* study conducted by the independent Water Finance Research Foundation, Cityworks meets the Departments requirements as follows:

◾ Originally founded in 1986, Cityworks was **designed specifically for municipal utility asset and maintenance management operations** and has stayed focused within the industry since.

◾ **Cityworks is the only GIS-centric CMMS solution** on the market. Instead of requiring middleware and/or third-party integration tools in order to share data with the GIS, Cityworks works and exists wtihin the GIS taking full advantage of Esri GIS capabilities.

◾ Cityworks is designed such that the **solution can be tailored to how the Department operates** instead of requiring work processes to change to meet software limitations. This can be done without customization to the software minimizing future vendor/consultant dependencies and ensuring ease of patch and upgrade installation.

◾ The Cityworks solution **architecture anticipates and encourages integration with other systems**. Cityworks was one of the first CMMS solution vendors to provide a fully documented data model to its customers. In addition, Cityworks offers application programming interfaces (API's) for work orders, service requests, metrics (enabling meter-based preventive maintenance schedules) and many others.
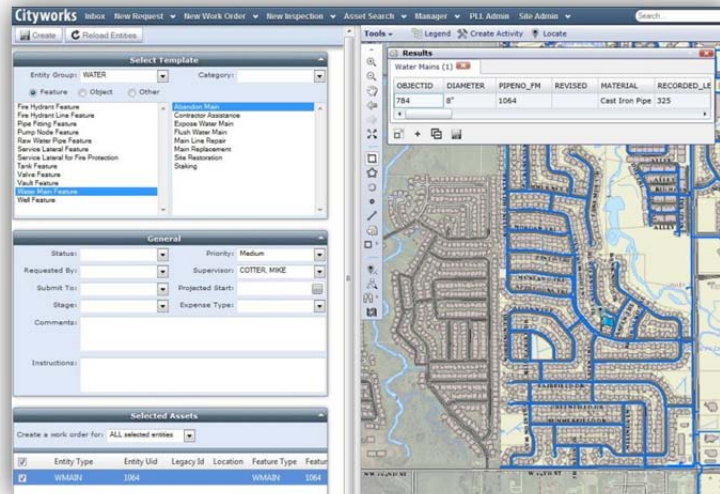
SCOPE OF WORK
The following SOW provides the detailed tasks necessary to implement Phase I of Cityworks Server AMS for the Department. Each task is described in detail along with the specific deliverables, Department responsibilities, and assumptions utilized to develop the associated level of effort.

Task 050: Data and Business Process Review

To plan for the implementation of a new CMMS, Black & Veatch will provide an initial assessment of data in the existing Accela database, GIS, and the systems integration requirements with Tyler Techonlogies MUNIS system that is being implemented. The Accela system that is being replaced by the new CMMS has been without a system administrator for several years and Black & Veatch recommends getting a more detailed understanding of this impact before fully implementing the new CMMS. The findings of this assessment will be used to validate the assumptions identified for the execution of the remaning tasks.

Additionally, Black & Veatch will meet with Operations staff to develop a high level understanding of key business processes, such as reactive maintenance management (eg. what are the communication, data, and work protocols for responding to a broken water main).

Subtask 051: Onsite Assessment and Phase II Coordination
Black & Veatch will spend up to ten days onsite working with Department staff. The focus of this assessment will include the following:

- Overall Cityworks system planning/design and coordination to include multiple departments (for Phase I & Phase II implementation across multiple departments);

- Data migration assessment of the existing Accela database;

- GIS geodatabase;

- Recommendation for CMMS integration(s) between

  - Tyler MUNIS (Utility Billing);
  - SCADA;
  - Inventory; and
  - CCTV.

- Gathering of financial reporting requirments to facilitate and document the materials management, emplloyee labor, and equipment cost tracking requirements in Cityworks.

Subtask 052: Summary Report and Recommendations
Black & Veatch will provide a documented summary report of findings, which may result in revisions to the CMMS implementation approach, fee and schedule. In that event Black & Veatch will provide an updated approach, fee and schedule to the City for review and approval. Black & Veatch will evaluate if additional work that may be required, as a result of the findings from this Task, could be covered by the available project contingency and inform the City of this option for the City to approve use of the contingency.

Task 100: System Configuration

Subtask 101: GIS Review and Recommendations Technical Memorandum

Black & Veatch will begin configuration of the Cityworks solution tailored to Department requirements and workflows. This process will begin by evaluating the Department's current Geographic Information System (GIS) environment – specifically, the current enterprise geodatabase design to support storing asset data for plant assets.

The Department currently has a GIS developed for the distribution and collection systems. Cityworks, being a GIS-centric solution, will require development of a GIS database structure (referred to as a geodatabase) to store data for the assets at the water and wastewater treatment plants as well as pumping and lift stations within the Department. For existing GIS layers, Black & Veatch will review and provide recommendations on improvements for the Department to implement on the GIS in order to better support the implementation of Cityworks.

For the plant asset data, Black & Veatch will provide a list of assets and necessary attributes for the Department to develop within the GIS. In parallel with Subtask 101, Black & Veatch will review the existing Accela database to determine the necessary assets that the City may need to create in the GIS. Utilizing the Accela data as the template for both the water and wastewater treatment plant asset hierarchies, Black & Veatch will document the required GIS feature, object and relationship classes for the Department to develop within the GIS. Black & Veatch will coordinate with City staff during the GIS and Accela data evaluation to provide the Department's GIS personnel with the information needed for the Department to build and design the geodatabase. Black & Veatch can provide ad-hoc support to City staff during development of the asset data structure and geodatabase at the request of the Department, as supplemental services to this Work Order.

Subtasks 102-105: Iterative Cityworks Configuration
Specific to the Cityworks configuration, Black & Veatch will follow an iterative configuration process that is based on analyzing and identifying a subset of requirements, configuring the system to support that subset of requirements, reviewing with Department staff in a workshop setting, adjusting the configuration based on feedback from the workshop, and then repeating the process again up to a total of four (4) iterations for Phase I implementation. An overview of this process is shown in Figure 1. This iterative process allows for frequent client participation and feedback resulting in incremental changes during configuration preventing misunderstandings in how the system will function and be configured for the Department. It is expected that the Accela data and workflows for water and wastewater treatment will be replicated by Black & Veatch, as best as possible, within Cityworks.
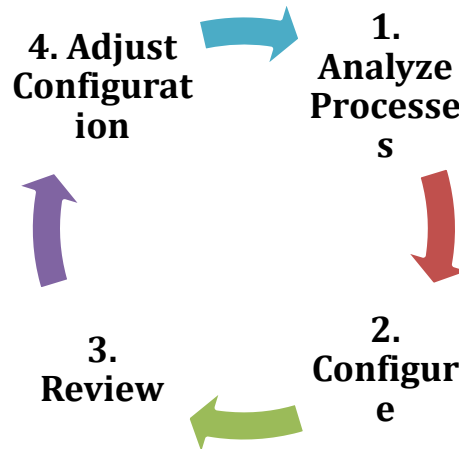
Figure 1. Black & Veatch Cityworks Configuration Process

Each iteration will involve on-site time to review and analyze processes followed by off-site activities to configure the reviewed processes. It is expected that core maintenance business processes have documentation to server as the foundation for review and analysis. The configuration will then be reviewed with staff via an on-site workshop whereby staff feedback will then be coordinated into the configuration based on that review. Following the workshop, subsequent processes and requirements will then be reviewed to re-start the process. Black & Veatch will provide up to four (4) iterations of the configuration cycle to complete the full configuration of the modules purchased by the Department for this implementation.

Subtask 106: Custom Reports Development
Although Cityworks comes configured with many out of the box reports, a common part of any implementation is the development of reports that are custom and unique to the Department. Black & Veatch will provide up to 40 hours of technical custom report development support as part of the Cityworks implementation.

Task 100 Deliverables

■ GIS Review and Recommendations Technical Memorandum (TM) identifying recommendations to existing and/or new GIS feature/object classes to support Cityworks implementation based on Black & Veatch's review of the Department's GIS geodatabase and Accela's database.

■ Up to a half day workshop to define the City's enterprise wide Cityworks design needs (phase I & II design).

■ Four (4) iterations of system configuration cycles. During each interation, we will have a focus on Iteration 1 - collection/distribution system; Iteration 2 - water treatment plant; Iteration 3 - wastewater treatment; and Iteration 4 - pumpstations/elevated tanks. Each cycle including:

  ● One (1) day of on-site requirements and process analysis
  ● Completed system configuration for requirements and processes reviewed during analysis

- Two (2) days of on-site configuration review workshop
- Completed adjustments to configuration based on results of review workshop

■ Up to five (5) days of financial reporting requirments gathering to facilitate and document requirements for materials management, emplloyee labor, and equipment cost tracking requirements in Cityworks. Reports development for other City departments will be performed under a separate Work Order.

Department Responsibilities

■ Identify core project team to be engaged in configuration decisions for the project. Core team should include representation from all operational groups (e.g. wastewater treatment, water production, water distribution, lift stations, wastewater collection) that will utilize Cityworks.

■ Provide access to or export of existing utilities-related GIS data.

■ Review and provide feedback on GIS Review and Recommendations TM.

■ Implementation of recommended GIS changes/additions to support Cityworks implementation as identified in GISReview and Recommendations TM.

■ Creation of necessary assets and attributes in GIS for plant and linear facilities identified in the GIS Review and Recommendations TM.

■ Schedule with staff, provide facilities for and participate in requirements and process analysis efforts.

■ Schedule with staff, provide facilities for, and particpate in configuration review workshops.

Assumptions

■ Department is purchasing Cityworks through separate contract directly with Azteca Cityworks.

■ Department will provide necessary hardware and software compliant with minimum system requirements as specified by vendor. Intent is to establish both a production and development/test environment for implementation. Requirements are as follows:

- *Database Server* (separate databases or database instances for production and development/test)
  – Windows Server 2003 SP2, 2008, 2008 R2 or R2 SP1 (64-bit), 2012, 2012 R2 or 2016 (running Cityworks AMS 15.2.1 and newer)
  – 32GB RAM (or better)
  – Current Intel Xeon® / server class processor 3.46 GHz (or better)
  – 2 x 146 GB 15000 rpm Serial Attached SCSI (SAS) Disk Drives
  – Gigabit NIC
  – 32 GB RAM or better
  – 17" high-resolution color monitor; 1024 x 768 pixels or higher

- *Application Server* (separate servers for production and development/test)

- – Windows Server 2008 R2 or R2 SP1/SP2 (64-bit), IIS 7.5
- – Windows Server 2012 or 2012 R2, IIS 8.0/8.5, or
- – Windows Server 2016 (64-bit), IIS 10 (running Cityworsk AMS 15.2.1 or newer)
- – 24GB RAM (or better)
- – Intel Xeon® /server class processor 3.46 GHz (or better)
- – Application consumes 1 GB of disk space (500 MB on system drive)
- – 2 x 146 GB 15000 rpm Serial Attached SCSI (SAS) Disk Drives
- – Gigabit NIC
- – 17" high resolution color monitor; 1024 x 768 or higher
- – .NET 4.5 Framework (.NET Extensibility 4.5 only if using Windows Server 2012/R2, while .NET Extensibility 4.0 as well if using Windows Server 2008 R2 SP1).NET 4.6.2 Framework (installed on both application and GIS servers). Requires Crystal Reports Runtime 13.0.16–13.0.20
- ● ArcGIS Software
  - – ArcGIS Server Standard or Advanced Enterprise 10.3, 10.3.1, 10.4, 10.4.1; Portal for ArcGIS 10.3, 10.3.1, 10.4, and 10.4.1; ArcGIS Enterprise 10.5, and 10.5.1 (Portal for ArcGIS, ArcGIS Server, and Data Store) and ArcGIS Online (10.5.1 is only compatible with 15.2.1 and newer)
  - – ***OR***
  - – ArcGIS Server Advanced Enterprise 10.1 SP1, 10.2, 10.2.1, 10.2.2, 10.3, and 10.3.1

- ● Relational Database Management System Software (one of following)
  - – Oracle 11g R1
  - – Oracle 11g R2
  - – Oracle 12c or 12c R1
  - – SQL Server 2008 R2
  - – SQL Server 2012
  - – SQL Server 2014
  - – SQL Server 2016

- ■ Department will provide necessary remote access (VPN and remote terminal access) to complete necessary Cityworks and GIS configuration activities.

- ■ Department will procure required hardware to facilitate mobile accessbility.

- ■ Department will provide existing Accela data in relevant database backup format (e.g. SQL Server *.bak or Oracle *.dmp)

- ■ Modifications to the asset hierarchy will be completed by City staff.

Task 200: Data Migration

Subtask 201: Accela Data Review and Data Migration Specification

The Department currently has asset nameplate and maintenance history information within a legacy CMMS solution from Accela. In order to preserve this information, it will be migrated to the Cityworks solution. Black & Veatch will review the Accela data in concert with the Cityworks configuration and develop a data migration specification (in Microsoft Excel or similarly agreed upon product and format) identifying the source information in Accela and the target location in Cityworks. Black & Veatch will discuss the migration specification with the Department prior to the testing of the data migration.

Subtask 202: Test Data Migration
Following review and acceptance of the migration specification, Black & Veatch will conduct a test migration of the data into the development/test environment. Black & Veatch will verify the results of the test data migration for applicability for the production data migration. Once migrated, this data will be reviewed by Department staff for acceptance.

The following information has been identified to be migrated to Cityworks from Accela:

■ Asset/equipment records including nameplate information (make, model, manufacturer, performance standards, etc.). Note that asset data will require migration into the GIS as the common repository for the asset registry.

■ Work order history for currently active assets.

■ Preventive maintenance schedules and assocation to respective assets.

■ Static work order cost information where available.

Subtask 203: Production Data Migration
Prior to end-user training and go-live, a data migration will be conducted into the production environment. This migration will be staged in order to migrate a bulk of historical data prior to go-live with a final migration effort immediately prior to switchover to Cityworks solution.

Task 200 Deliverables
■ Draft data migration specification in Microsoft Excel.

■ Final data migration specification in Microsoft Excel.

■ Completed test data migration into development/test environment.

■ Adjustments to data migration procedures resulting from test migration results.

■ Completed production data migration into production environment.

Department Responsibilities
■ Review and provide feedback on data migration specification.

■ Review and provide feedback on test data migration results.

Assumptions
■ Data migration test is typically scheduled following completion of the third configuration iteration as at this stage the configuration will closely match final configuration.

■ Historical work orders for plants, collection and distribution system assets in Accela have been created associated to an address. To associate to assets, work orders are assumed to be geocoded and then, utilizing tools inherent in GIS, used to select the nearest asset of the correct type. Upon identification of correct asset, work order should be associated with that nearest asset.

- Data stored in Accela, both asset data and any work history data, is correct and will not require data cleansing, standardization or normalization.
- Accela work orders with incorrect, unpopulated or partially populated addresses will not be migrated.
- Correction of work orders that are unable to have an asset attached is not included in the scope of work, but may be provided as supplemental services to this Work Order.

■ Primary concerns for the migration of data from Accela to Cityworks is the occurrence of maintenance activities. Static cost information (e.g. manually entered cost information onto a work order) will be migrated where available. However, detailed, derived costs such as that from calculating labor based on regular and overtime hours booked on a work order by employee, materials costs by part line item and average unit price, hourly or unit-based costs of equipment usage, etc. will not be migrated from Accela if present. The occurrence of the work order, dates for creation/completion, notes from maintenance personnel, static work order costs information, and problem/failure/cause/action data will be migrated only.

■ Preventive Maintenance records in Accela have correct and current assets, PM schedules, and tasks associated that will be used similarly within Cityworks.

■ Inspections will be migrated and recreated as-is.

■ Retired (no longer active) assets and maintenance history will not be migrated into Cityworks.

■ Pending approval from the City, the contingency may be used to initiate the data migration from Accela to Cityworks.

Task 300: Systems Integration

Subtask 301: Integrations Workshop and Technical Memorandum
The Department has identified requirements to develop integrations between its CMMS solution (Cityworks) and other key information systems. This will allow for more accurate tracking of true maintenance and asset lifecycle costs enabling the Department to make more informed decisions regarding rehabiltitation or replacement of assets. In addition, creating integrations between systems will reduce the likelihood of human error resulting from the entering of data multiple times into multiple systems and providing for efficiency improvements.

The Department has identified the need for the following integrations to be implemented in parallel with the implementation of Cityworks. Integration responsibilities are outlined below:

■ **Employee and Labor Rate Information.** Keeping lists of employees up to date along with their associated labor rates is important to support accurate labor cost accounting for maintenance activities against infrastructure assets. Initial discussions indicate that this information is available through either the human resources or financial management systems.

■ **Parts/Materials Inventories.** Each plant maintains an inventory of parts and materials necessary to meet service levels and regulatory requirements for operating the plants. Field staff maintain similar caches of materials for the distribution and collection systems. Integration with the financial management system (utilized by the City Warehouse) to facilitate utilities materials management in the CMMS solution will result in better maintenance cost tracking and overall managaement of inventory. Cityworks Storeroom has the capability to perform materials management and may be used for the Department; however, integration to the City financial management system will still be used to process material purchase orders. *Therefore, integration with the City's Oracle-based Financial Management System will be completed under a separateWork Order.*

Black & Veatch will load material data from GEMS into Cityworks using standard Cityworks materials loading templates. It is assumed that City staff will provide Black & Veatch with the material data export from GEMS in a common export format such as .xls, .txt, or .csv type file. This data export shall include all pertinent data the City requires for loading into Cityworks. Black & Veatch will work with City staff to define material attribute requirements prior to the City performing the data export. Black & Veatch will then load that data into Cityworks.

■ **Utility Billing.** Many maintenance activities associated with the distribution system revolve around meters. One example is the meter change out process. Integration with utility billing will be important in order to support providing the billing system the necessary information to support accurate and timely bill generation for such activities. *Integration with Utility Billing will be led by Tyler Technologies under a separate scope of services.*

■ **Supervisory Control and Data Acquisition (SCADA).** The SCADA system at the plants is used to track runtimes (e.g. hour meters) as well as current equipment performance characterisitics (perssure and temperature readings). Best practices for preventive maintenance dictate that utilizing these data points to trigger maitnenance activities can extend the life and improve the performance of equipment. *Black & Veatch will lead SCADA integration activities.*

■ **CCTV Inspections and Observations.** The Department utilizes WinCan to CCTV collection system infrastructure and record the occurrence and severity of defects within the system following NASSCO PACP guidelines. These defects represent condition information on the assets and are important data points to drive maintenance decisions in the CMMS solution. *Black & Veatch will lead WinCan integration activities.*

There is a variety of information that will require definition for each of the integrations identified above. To develop this information, Black & Veatch will facilitate two days of on-site

integration design workshops to work with the appropriate Department staff to identify the following:

■ Best source (system) for desired information.

■ Type of integration required (read-only, read/write).

■ Frequency of data updates (real-time, daily, weekly, annually).

■ Available integration methods (extract-transact-load, database level integration, existing application programming interfaces [API's], or web service frameworks).

■ Potential transactions and specific information that will be required for each transaction.

This information will be captured in a Cityworks Systems Integration Technical Memorandum and provided to the Department for review and comment.

Subtask 302: Systems Integration Support
Systems integration support will be provided for the following technologies under this Work Order, as described below:

■ Munis Utlity Billing

■ SCADA

■ WinCan

The City selected Oracle as its Enterprise Resource Planning (ERP) solution – Human Resources and Financial Management. Black & Veatch will work with the Oracle ERP implementer to define integration requirements and develop the Cityworks API/web services to receive/send information from Cityworks through the Cityworks supported API only. Should the City require assistance developing the Oracle API/web services and actual integration between the two (Oracle and Cityworks APIs/web services) Black & Veatch can provide assistance as supplemental services to this WorkOrder.

For integration related to utility billing information (e.g. meter change outs, installs and pulls), the City has implemented the Munis Utility Billing solution from Tyler Technologies. Tyler's practice is to not allow or support third party integrators to implement integrations to their solutions. To facilitate the required integration for utility billing, Black & Veatch will develop flow of information into and out of Cityworks utilizing the supported API's/web services. Black & Veatch will not develop custom interfacing under this scope of services. If required, the City will be responsible for development of an interface between the City's middleware and Tyler MUNIS. The Department will engage Tyler to develop the necessary integrations into and out of Munis along with the actual integration between the APIs/web services. Black & Veatch will coordinate with Tyler staff to handoff information between the two systems using the provided API's/web services in such a way that Tyler will continue to support the Munis implementation. A total of 40 hours has been allocated for coordination with Tyler. If desired by the City, Black & Veatch could provide full integration with Tyler as supplemental services to this Work Order.

SCADA integration will be accomplished via the use of the SCADA system's historian database (for security reasons a live connection to the SCADA system is not recommended). SCADA integration will involve a one-way integration from the historian database to Cityworks, via the Cityworks Metrics API, to initiate maintenance activities (either corrective or preventive). Examples include motor or pump run-times to initiate preventive maintenance or temperature/pressure alarms to initiate corrective maintenance. Please note it is not recommended to implement SCADA integration for corrective alarms if there is a high rate of alarms in the current SCADA environment.

Finally, for integration with the City's WinCan solution for gravity main inspections and defect logging and classification, Black & Veatch will configure the Cityworks Interface for PACP. Cityworks Interface for PACP allows data to be imported into the Cityworks CCTV Inspection tables. Pipe ratings are calculated during the import routine based on the PACP condition index value. In addition to importing CCTV Inspection data, the interface does provide an export function allowing for GIS mainline and Cityworks work order data to be exported to the database. The export is based on field mappings between the GIS and the PACP data exchange database and limited by the PACP-compliant database constraints.

Deliverables
■ Two (2) days of on-site systems integration workshop.

■ Draft Cityworks Systems Integration TM.

■ Final Cityworks Systems Integration TM.

■ Development of input/output data integrations for utility billing information to/from Cityworks as specified in Systems Integration TM.

■ Development of SCADA integration from historian database into Cityworks as specified in Systems Integration TM.

■ Implementation of Cityworks Interface for PACP for integration between Cityworks and WinCan solution.

Department Responsibilities
■ Schedule with appropriate Department and information technology staff for systems integration workshops.

■ Review and provide feedback on Cityworks Systems Integration TM.

■ Provide access to corresponding development/test instances of respective systems to be integrated with to support integration development.

■ Engagement of Tyler Technologies to support development of Munis utility billing solution integration.

■ Provide technical support to review, confirm, and troubleshoot integrations during development efforts.

Assumptions

■ All integrations are assumed to either utilize an existing vendor API or integration framework that supports standard software development tools and languages such as SQL, PHP, SOAP, or Microsoft .Net. Or, Department staff will be able to extract data into delimited text format from Department systems in support of extract-transact-load types of integration.

■ Data in WinCan solution is fully compliant with NASSCO PACP standards.

■ Common identifiers are present in Accela and SCADA solutions (e.g. common tag numbers or equipment identifiers). If common identifiers are not present, Department staff will be responsible for necessary data entry to create point of commonality of asset data between systems. If desired by the City, Black & Veatch could perform the needed data entry through supplemental services to this Task Order, or use of available project contingency, if approved by the City.

■ Integration with WinCan will be achieved utilizing the Cityworks PACP CCTV interface (without modification to the existing software).

Task 400: System Acceptance Testing

Subtask 401: Test Scenarios Development and Technical Memorandum
Upon completion of configuration, data migration, and system integration development, Black & Veatch will conduct system acceptance testing to ensure that Cityworks has been implemented per the configuration, migration, and integration decisions made throughout the project. Prior to the commencement of testing, a testing and acceptance document (Acceptance Testing TM) will be prepared that identifies the specific scenarios to be tested. Scenarios will include all configured modules, processes that require integration with other Department systems in order to adequately test the functionality of the developed integrations, and the review of historical data migrated into the system as well.

Subtask 402: Conduct System Acceptance Testing
Acceptance testing will take place on-site at Department facilities over a one week period. Testing will be facilitated by Black & Veatch personnel however will be completed by Department staff (Core Team). Any scenarios that may not pass may either be addressed during the testing week and re-tested or addressed and then re-tested at a later date.

Deliverables

■ Draft Acceptance Testing TM.

■ Final Acceptance Testing TM.

■ One (1) week of on-site system acceptance testing.

Department Responsibilities

■ Review and provide feedback on Acceptance Testing TM.

■ Schedule with staff, provide facilities for, and participate in on-site system acceptance testing.

Assumptions

■ None

Task 500: End-User Training & Go-Live Support

Subtask 501: End-User Training

Black & Veatch will employ a "train-the-trainer" approach for End-User Training. This will involve developing and executing a four (4) day training class covering the following topics. Attendees will then have the knowledge and materials necessary to train department end-users on the necessary functions of the system based on job responsibilities. The anticipated agenda for the "train-the-trainer" approach will be as follows:

■ Day 1
- Navigating the Cityworks user interface
- Using the map and updating asset information
- Service requests
- Work orders

■ Day 2

- Work orders (cont.)
- Labor, Materials, Equipment
- Contractors
- Inspections
- Cityworks PACP CCTV Interface

■ Day 3

- Preventive Maintenance Schedules
- Cityworks Projects and Project Management
- Reports
- Cityworks Mobile

■ Day 4

- Inventory management – vendors, parts, requisitions, purchase orders, issues, receipts, audits, store to store transfers
- Cityworks administration – security and provisioning new users, system updates and patchces, report development and deployment

Each training class topic will utilize the standard Cityworks training materials provided by the vendor but will be augmented by trainer knowledge specific to the Department's implementation and workflows. All training will be conducted at the Department's facilities.

Subtask 502: Go-Live Support
Following completion of training, Black & Veatch will provide 40 hours of go-live support to address the additional support requirements during a system go-live as well as to address any unforseen configuration changes during initial system use.

Deliverables
■ Four (4) days of on-site "train-the-trainer" training;

■ Forty (40) hours of go-live support by senior Cityworks specialist.

Department Responsibilities
■ Schedule with staff, provide facilities and equipment for all on-site training courses.

Assumptions
■ All users will have basic computer literacy (e.g. understanding how to utilize a mouse, keyboard, and web browser) or Department will provide basic computer training staff prior to commencement of Cityworks specific training classes.

■ All go-live coordination related to hardware provisioning and setup (e.g. network user accounts, network connectivity) will be provided by Department personnel.

WORK TO BE PERFORMED BY THE DEPARTMENT
■ Designate a Department project manager to liason with the Black & Veatch project manager for project coordination.

■ Schedule with staff and participate in on-site project kickoff meeting.

■ Timely review of deliverables so they can be finalized.

PROJECT SCHEDULE
Based on this SOW, we estimate that project execution should be approximately 48 weeks or 11 months from the commencement of Task 050. We will work closely with the Department to minimize project duration as much as practical.

PROJECT COST
The level of effort for the described SOW for Phase I is a lump sum amount of $388,852.00, as detailed in the table below. This amount includes a contingency of $50,000.00, which may be used upon receiving approval from the City. Monthly invoices will be submitted to the Department based on project progress. Phase II (Citywide Implementation) will be performed under a separate Work Order and budget outside of the Department of Public Utilities.

Task	Cost
Task 050: Data and Business Process Review	$60,352.00
Task 100: System Configuration	$91,854.00
Task 200: Data Migration	$53,856.00
Task 300: Systems Integration	$76,300.00
Task 400: System Acceptance Testing	$26,076.00

Task	Cost
Task 500: End-User Training and Go-Live Support	$30,414.00
Contingency	$50,000.00
Total	**$388,852.00**

We look forward to the opportunity to assist the Department with this innovative and important project in support of its asset management efforts. Please, feel free to contact me with any questions at (954) 465-6872.

Very truly yours,

BLACK & VEATCH CORPORATION

Rafael E. Frias III, PE
Client Director

RF

cc: Francois Domond, PE; Clece Aurelus, PE; Feng Jiang, PE; Mark Seastead, Bryan
Dickerson; Isabel Botero, PE; Melissa Velez, PE

City of Hollywood, FL
Cityworks Implementation for Department of Public Utilities - Phase I
Level of Effort Estimate

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Task Description		Project Director	Project Manager	Sr. Technical Specialist	Technical Specialist	Project Engineer	Senior Administrator	Totals Hours	Totals Cost
Cityworks Implementation for Department of Public Utilities - Phase I									
Task 050	**Data and Business Process Review**								
051	Onsite Assessment and Phase II Coordination	4	8	96	96			204	$43,476.00
052	Summary Report and Recommendations	4	8	24	40		8	84	$16,876.00
	Subtotal	8	16	120	136	0	8	**288**	**$60,352.00**
Task 100	**System Configuration**								
101	GIS Review and Recommendations Technical Memorandum	2	4	4	40	40	8	98	$16,718.00
102	Configuration - Iteration 1			16	16	120		152	$23,840.00
103	Configuration - Iteration 2			8	8	100		116	$17,600.00
105	Configuration - Iteration 3			8	8	60		76	$11,920.00
105	Configuration - Iteration 4			4	8	60		72	$11,020.00
106	Custom Reports Development	4	8		8	40	8	68	$10,756.00
	Subtotal	6	12	40	88	420	16	**582**	**$91,854.00**
Task 200	**Data Migration**								
201	Accela Data Review and Data Migration Specification		4	40	60	24	16	144	$26,796.00
202	Test Data Migration			24	40	40		104	$19,080.00
203	Production Data Migration			8		40	5	53	$7,980.00
		0	4	72	100	104	21	**301**	**$53,856.00**
Task 300	**Systems Integration**								
301	Integrations Workshops and Technical Memorandum	4	8	8	64	32	8	124	$22,620.00
302	Systems Integration Support				240	40		280	$53,680.00
	Subtotal	4	8	8	304	72	8	**404**	**$76,300.00**
Task 400	**System Acceptance Testing**								
401	Test Scenarios Development and Technical Memorandum	4	8	8		40	8	68	$10,956.00
402	Conduct System Acceptance Testing			8	24	60		92	$15,120.00
	Subtotal	4	8	16	24	100	8	**160**	**$26,076.00**
Task 500	**End-User Training & Go-Live Support**								
501	End-User Training	4	8	8	24	60	8	112	$18,596.00
502	Go-Live Support	2	4		24	40		70	$11,818.00
	Subtotal	6	12	8	48	100	8	**182**	**$30,414.00**
	Contingency								
	Contingency							0	$50,000.00
	Subtotal							**0**	**$50,000.00**
	Totals	28	60	264	700	796	69	**1,917**	**$388,852.00**
	Hourly Rates	$275.00	$197.00	$225.00	$200.00	$142.00	$100.00		
	Totals	$7,700.00	$11,820.00	$59,400.00	$140,000.00	$113,032.00	$6,900.00		$388,852.00