DATE: February 27, 2018

TO: Mayor and City Council

FROM: Director of Utilities & Environmental Services

SUBJECT: Water Pollution Control Facility (WPCF) Phase II Facilities Plan – Authorization to Execute a Professional Services Agreement with Black & Veatch Corporation

RECOMMENDATION

That Council adopts the attached resolution authorizing the City Manager to execute a professional services agreement with Black & Veatch (B&V) Corporation to perform engineering services for the development of a WPCF Facilities Plan and for the design of improvements to the WPCF existing facilities., in an amount not to exceed $850,000.

SUMMARY

The WPCF Facilities Plan is intended to provide a comprehensive planning document that will serve the WPCF infrastructure needs for the next 25-year planning period. This Facilities Plan is part of a larger effort guiding the design and construction of the Phase II WPCF Upgrade. The Facilities Plan will determine the most appropriate technologies and identify the costs for inclusion in the next treatment facility upgrades. The services needed for the design of improvements include preparation of preliminary and detailed design documents, bid phase services, and engineering services during construction.

Conceptually, the scope of work should address the following seven project components:

1. Headworks evaluation
2. Parallel forcemain
3. Vacuator replacement evaluation and potential reuse
4. Nutrient removal alternative evaluation and strategic planning
5. Old Cogen building evaluation and potential reuse
6. Schematic building design and WPCF site planning
7. Final Clarifiers, GBT Sludge Wetwell and Primary Clarifier Effluent Junction Box improvements

Because of the technical expertise and specialized nature of the work required, staff recommends executing an agreement with Black &Veatch for engineering services, in an amount not to exceed $850,000.

BACKGROUND

In 2001, the City engaged Brown and Caldwell (B&C) to initiate the preparation of the 2001 Master Plan with the primary focus on the secondary treatment, due to deficiencies of the existing biological treatment processes. The goal of the 2001 Master Plan was to provide the steps for the City to progress from unreliably, maintenance intensive technology, to sound operator friendly technology. The recommended improvements were divided into two phases, including:

1. Phase I to address the immediately required elements to achieve the conversion and redundancy objectives. The major element of Phase I is the secondary conversion to Trickling Filter/Solids Contact (TF/SC).
2. Phase II to address the lower priority elements, including resolving some existing hydraulic bottlenecks, improving disinfection, adding additional primary treatment capacity, increasing flow equalization volume and rehabilitating the existing tricking filter (WTF).

The Phase I Improvements Project, including the TF/SC facilities was completed in 2009. In 2014, the City retained B&C to update the 2001 Master Plan and develop a comprehensive capital improvement plan (CIP) that includes near-term and long-term projects to address optimization, future capacity needs, and potential new regulations. The following CIP projects have been successfully implemented.

Summary of Implemented Capital Improvement Projects		
Project Title		**Completion**
1	New degritter/classified system	2017
2	Convert de-commissioned DAFT to new primary clarifier	2016
3	Whitesell Street extension through WPCF	2017
4	Headworks improvements	2017
5	Digester sludge mixing tank	2017
6	Digester gas piping and metering	2017

These improvements have enabled the WPCF to continue improving efficiency, while providing reliable treatment. However, since the 2014 Master Plan Update was developed, the City is facing several new concerns and conditions, including:

1. A decision to carry forward the TF/SC system or adopt a new technology to provide flexibility to meet nutrient removal requirements
2. Accelerated deterioration of the North Vacuator equipment
3. Immediate need of influent fine screens for rag removal
4. Increased influent BOD and TSS concentrations due to water conservation
5. Significant growth of laboratory operations
6. Expected increase in recycled water demand due to drought
7. Green practices in alignment with City sustainability goal
8. Increased interest in near-shore discharge

Among the new concerns, development of the nutrient removal management strategy to meet the future regulatory requirements is the most important task of the new Facilities Plan. Nutrients in the San Francisco Bay (Bay) are a growing concern for the Bay Area water quality

community. A growing body of evidence suggests that the historic resilience of the Bay to nutrient enrichment could be weakening. To address the increased concern, regulators have promoted the development of strategies to manage nutrient loads. On April 9, 2014, the Water Board issued a Waste Discharge Requirements Order (Watershed Permit) for nutrients from Municipal Wastewater Discharges to the Bay, including the City's wastewater discharge. The Watershed Permit sets forth a regional framework to facilitate nutrient removal studies for developing nutrients management regulations.

WPCF discharges treated effluent to a common outfall under the Joint Exercise of Powers Agreement (JPA) of the East Bay Dischargers Authority (EBDA). The current JPA which will expire in 2018 is being renegotiated among the EBDA agencies. The City desires to extend the JPA for another 20 years; however, staff realizes that the current effluent discharge via the EBDA common outfall will not be a long-term solution and that the City should explore other discharge opportunities, including near shore discharge. This project will study the feasibility and review the treatment requirements of near shore discharge.

The City's WPCF is at a critical juncture, where future upgrades and investment into the plant's infrastructure will require a comprehensive review of future nutrients removal regulations, feasibility of near shore discharge, plant process optimization and operations and maintenance needs over the next 25 years. After reviewing the current CIP plan, staff believes that it is necessary to develop a comprehensive strategic plan for the City to integrate and coordinate the efforts and therefore recommends embarking on the Phase II Facilities Plan to review the recommendations and refine/modify the CIP plan, prior to implementing additional projects.

DISCUSSION

The purpose of the Project is to develop a comprehensive planning document that will serve the WPCF infrastructure needs for at least a 25-year planning period. The review of the related work previously performed as part of the 2014 Master Plan Update will be conducted as the first step of the project. The consultant shall provide an evaluation to analyze and determine if the proposed recommendations should be carried forward or modified to reflect the updated conditions. The drivers and goals of this Project includes:

1. Drive a new approach to identifying infrastructure needs and determining solutions that are coordinated, efficient, sustainable and innovative.
2. Create a flexible design that allows a progression of modifications, which add to the capability of the initial installation to comply with future nutrient removal requirements and other increasing regulatory constraints.
3. Develop a comprehensive treatment facilities plan which prepares the City for future plant modifications that would allow it to coordinate with ongoing water recycling efforts and achieve a long term near shore discharge goal.
4. Develop an overall integrated site plan covering all four WPCF parcels to establish a framework and general strategy for developing future facilities.
5. Develop a coordinated and organized building, site, and yard piping plan which efficiently utilizes available site space, improves the traffic circulation and access patterns, and streamlines the plant hydraulics.

6. Explore potential benefits that treatment technologies may bring to the existing waste to energy facilities.

The following paragraphs describe in detail the work to be completed, the consultant selection process, and cost for the proposed services.

Scope of Work

The scope of work addresses the tasks necessary to perform engineering services for the development of a WPCF Facilities Plan and for the design of improvements to the WPCF existing facilities. Specifically, the services provided for the seven project components would include:

1. Headworks Evaluation: The plant currently uses comminutors to reduce the size of debris in the influent to protect the influent pumps. The comminuted debris passed to the downstream processes forms rag balls causing clogging of pumps and ultimately accumulates in the digesters, significantly reducing the available digestion volume. The consultant will investigate alternatives and recommend a solution that addresses the operating issues.

2. Parallel Forcemain: The current single 36"-diameter forcemain was designed to handle the maximum design pumping capacity of 43 mgd at a velocity of 10 ft./sec. The high design piping velocity creates a significant hydraulic headloss restricting the pumping capacity. The consultant will review the recommendation and evaluate alternatives to resolve the hydraulic bottleneck.

3. Vacuator Replacement Evaluation: The Vacuator is a vacuum flotation unit which removes scum, floatables and grits. The Vacuator which was constructed in 1958 provides satisfactory performance with respect to achieving the desired scum and grit removal. However, some of the components are reaching an advanced age and replacement parts are no longer available. The City has expended a significant amount of effort on Vacuator maintenance to keep the aged system running. The consultant will perform a comprehensive study of the grit and scum removal and recommend whether the City should rehabilitate the existing processes or invest in new facilities to meet the long-term needs.

4. Nutrient Removal Alternative Evaluation and Strategic Planning: As part of the 2014 Master Plan Update, a high-level alternatives evaluation was performed to address future nutrient removal requirements. The recommended nitrogen and phosphorus technologies offer the best value on the basis of capital cost investment. However, staff realizes that a low capital cost can be overshadowed by greater O&M costs over the planning horizon, and, more importantly, sustainability should be considered in all aspects of the projects. The consultant will explore other alternatives and take a new approach to identifying needs and determining solutions that lead to long term sustainable planning. In addition to regulatory compliance, the review and study of nutrient removal should also help achieve the City's near shore discharge goal and consider the City's long-term goal of maximizing recycled water within the City. Since the Master Plan was prepared, the City has initiated the recycled water project and is

aggressively pursuing near shore discharge opportunities. The consultant will develop a comprehensive strategic plan for the City to integrate and coordinate the efforts.

5. Schematic Building Design and WPCF Site Planning: In the 2014 Master Plan Update, the recommended project was to construct a new 9,000 square feet building at the existing administration parking area to provide space for administrative and laboratory function areas. The proposed 4,000 square feet for laboratory area will not be adequate for the projected laboratory function, due to the growth of laboratory operations and the upcoming TNI (The NELAC Institute) compliance requirements. The Operations function area which currently occupies the old Control House will be moved to the new building. In addition, the City is considering moving the Source Control and some Engineering staff from other offices to the new building. The consultant will evaluate detailed space requirements and provide services necessary for the completion of the schematic building and site design and the conceptual overall WPCF site planning.

6. Old Cogen Building Evaluation: The existing Cogen Building structure and the electrical system is reaching the end of service life. Some replacement parts for the old electrical gears which were built in 1970 are no longer available. There is an immediate need to replace the existing electrical system. The City is considering constructing a new electrical building to house a new electrical system, instead of rehabilitating the Old Cogen Building and replacing the existing electrical system. The consultant will explore the feasibility and associated cost.

7. Final Clarifiers, GBT Sludge Wetwell and Primary Clarifier Effluent Junction Box Improvements: Repairs and modifications to the existing facilities are needed to improve reliability and enhance safety. The Consultant will provide engineering services to prepare contract documents; provide bid phase services; and provide engineering services during construction for the improvements.

Consultant Selection

On November 6, 2017, staff issued requests for proposal to four firms with experience and knowledge in projects of the kind needed at the WPCF. Two of the firms (Carollo and HDR) decided to form a joint project team due to their combination of expertise and resources. On December 8, the City received three proposals from 1). Black & Veatch; 2) Brown & Caldwell; and 3) Carollo/HDR. All three teams were invited to present their proposals to the City staff on December 14. The staff evaluated the three proposals using defined criteria, such as experience with similar successful projects, knowledge and technical expertise, and appropriateness of the cost and level of effort given the project scope. All three proposals were solid with each team having areas of strength.

While each of the three teams are highly qualified for the project with outstanding similar projects experience, in staff's view, Black & Veatch's combination of qualifications and responsiveness to the City's requirements best met the City's current needs. Black & Veatch achieved a higher rating in the selection criteria by providing a solid and innovative approach to the engineering design and proposing a knowledgeable and experienced project team.

Although cost of services was not a factor in staff's recommendation, as the total proposed costs from the three teams were very comparable, Black & Veatch's initial proposed fee was the lowest among the three proposals received with reasonable labor hours and billing rates. Staff has negotiated a detailed scope of work and a proposal fee of $749,946 with Black & Veatch. There are some inherent uncertainties in the scope of work, given the fact that all the components of this project relate to existing old systems and facilities and there is some potential for unexpected conditions and needs to occur. Staff requests a not-to-exceed amount of $850,000 to allow funding for possible changes in the scope and/or for changes to engineering services during construction.

STRATEGIC INITIATIVES

This agenda item supports the Complete Communities Strategic Initiative. The purpose of the Complete Communities initiative is to create and support structures, services, and amenities to provide inclusive and equitable access with the goal of becoming a thriving and promising place to live, work and play for all. The WPCF Phase II Facilities Plan identifies WPCF infrastructure needs and improvements to increase the reliability of the City's treatment plant, further supporting the goals of the City Council.

Goal 1: Improve quality of life for residents, business owners, and community members in all Hayward neighborhoods.

Objective 4: Create resilient and sustainable neighborhoods

FISCAL IMPACT

The estimated project costs are as follows:

Professional Engineering Services – Consultant		$ 850,000
Project Administration – City Staff		$ 85,000
	Total:	$ 935,000

The FY2018 Capital Improvement Program (CIP) described in both the Sewer Capital Improvement Fund (Fund 612) and the Sewer Replacement Fund (Fund 611) includes funding for the project components.

SCHEDULE

The following schedule has been developed for this project:

Notice to Proceed:	March 2, 2018
Completion of Project	December 2018

NEXT STEPS

Following Council approval, staff will finalize a professional services agreement with Black & Veatch Corporation and a Notice to Proceed will be sent out accordingly. Staff will return to the City Council for approval of future construction plans and specifications and calls for bids.

Prepared by: Feng Chang, Senior Utilities Engineer

Recommended by: Alex Ameri, Director of Utilities & Environmental Services

Approved by:

Kelly McAdoo, City Manager