



**CITY OF HAYWARD**  
**AGENDA REPORT**

AGENDA DATE 12/18/01  
AGENDA ITEM 2  
WORK SESSION ITEM \_\_\_\_\_

**TO:** Mayor and City Council

**FROM:** Director of Public Works

**SUBJECT:** Water Pollution Control Facility Improvements—Phase I: Authorization for Execution of a Professional Design Services Agreement

**RECOMMENDATION:**

It is recommended that the City Council approve the attached resolution that authorizes the City Manager to execute a professional design services agreement with Brown and Caldwell in an amount not to exceed \$3,400,000.

**BACKGROUND:**

The treated effluent from the City of Hayward's Water Pollution Control Facility (WPCF) is discharged through the East Bay Dischargers Authority (EBDA) pipeline, where it is combined with the treated effluents from other member agency plants before being discharged to San Francisco Bay. The biological treatment technology used at the WPCF is a one-of-a-kind combination process of a fixed film reactor (FFR) followed by a fluidized bed reactor (FBR). The FBR was a new and innovative technology that was chosen in the early 1980's based on financial incentives and certain guarantees from the Environmental Protection Agency (EPA). The FBR has not performed as expected, and even with system modifications, it is apparent that the FBR cannot work efficiently and reliably meet the City's future needs. During discussions of the 2001-02 Capital Improvement Program, the City Council was informed that staff believed that replacement of the FBR would be necessary to reliably meet discharge limitations.

To get a comprehensive picture of the sewage treatment plant and its overall condition, the City contracted with Brown and Caldwell Environmental Engineering and Consulting to analyze primary and secondary treatments at the WPCF. A Master Plan report dated September 2001 confirmed two significant conclusions: the FFR is not capable of providing complete treatment by itself at projected future flows and loads; and the FBR has not demonstrated an ability to provide the necessary additional required treatment of the FFR effluent.

The Master Plan also identified other treatment plant limitations in meeting the City's future needs. These include the inadequate final clarifier capacity and a lack of redundancy of critical treatment components that make routine maintenance difficult without adversely impacting the quality of the effluent.

Brown and Caldwell, working with City staff, evaluated three major alternatives for plant improvements aimed at resolving identified deficiencies. The evaluation included both economic and non-economic factors and concluded that the FBR should be replaced with a solids contact basin. The resulting combined process, known as the Trickling Filter/Solids Contact (TF/SC) process, has been implemented at numerous municipal installations in North America. The TF/SC process has consistently proven to be robust, reliable and easy to operate, producing a quality effluent significantly better than that currently being produced at our WPCF. The TF/SC process will greatly decrease the amount of solids discharged from the final clarifier to EBDA and hence to San Francisco Bay. It is anticipated that converting to a TF/SC process will keep discharges within allowable EBDA discharge requirements at all times. The TF/SC process is felt to be the best conversion for the WPCF in that it will preserve and integrate well with existing unit processes.

The Master Plan identified all plant improvements associated with implementing the TF/SC process and with resolving other identified plant deficiencies. The more pressing are identified as Phase I improvements. The Phase I improvements are as follows:

1. Remove the Fluidized Bed Reactor from the treatment process.
2. Construct a second trickling filter (FFR) that will increase treatment reliability and allow the WPCF to operate at its fully rated capacity. Along with the new FFR, an odor scrubbing bed will be constructed to treat off-gases to abate odors from the new FFR. A new pumping station will also be constructed that will serve both the existing and new FFR.
3. Convert the existing final clarifier into a solids contact tank following construction of the new final clarifiers. This will enhance solids removal during final clarification.
4. Construct two new final clarifiers. The existing final clarifier, to be converted to a solids contact tank, does not perform to expectations due to undesirable proportions. Providing two new clarifiers will also improve operational reliability.
5. Construct sewage solids thickening facilities to isolate and concentrate bio-solids going to the digesters. Improved thickening capacity at the plant will route sewage solids directly to solids treatment facilities without undo stress on the liquid stream process units.
6. Construct a new control structure that directs influent flows to the existing primary clarifiers. The existing influent box cannot distribute flows in the desired proportions to the clarifiers. The new influent box will allow for the appropriate balance of flow to each clarifier.

Phase I improvements will include a new operations manual. This is a "must have" document for a complex plant such as the WPCF. The manual will be computer-based, now the industry

standard, which will contain existing and new portions of the WPCF in the same document. Thus, from an operator's standpoint, the entire plant documentation will be seamless and calling up information, drawings and equipment data will be consistent and compatible with the planned manual for the AWT.

Construction will be phased in order to fast track those components having the most significant impact upon improving effluent quality, getting them on line earlier than would be possible through a single construction phase. The first construction contract will build the final clarifiers. The construction of the remaining Phase I improvements will follow. Phasing will be carefully scheduled to avoid conflicts.

Potential bidders will be pre-qualified prior to advertisement. This process will restrict bidding to those firms capable of properly and completely preparing responsible bids and who possess the experience and resources to prudently undertake construction of the Phase I improvements.

### **Environmental Review**

Also included in the consultant scope of work will be preparation of environmental documentation for the Phase I improvements. Based upon staff's experience with similar projects, it is anticipated that an Initial Study and Negative Declaration will result. The plant improvements will be contained within the existing WPCF boundary, except for the new trickling filter and attendant odor scrubbing bed that will be located on City property abutting the WPCF's eastern boundary. Growth inducement issues are being addressed in the environmental impact report for the updated General Plan and the project is not intended to increase the plant's permitted capacity beyond that which exists today.

### **Consultant Selection**

Staff requested seven firms to submit proposals for the project. All seven firms are known nationally in the wastewater field. Only one of the firms, Brown and Caldwell, submitted a proposal. Brown and Caldwell has demonstrated technical proficiency during the preparation of the master plan and facility reports and as technical experts advising the City on issues concerning the proposed Russell City Energy Center Advanced Water Treatment (AWT) Plant.

Two firms responded stating that they would not pursue the project; four firms cited other commitments for their technical resources. In discussions with two of the firms, they recognized that Brown and Caldwell's detailed knowledge of the WPCF, and specifically the proposed improvements, would be difficult to compete against. They recognized that in order to compete effectively, they would have to make a significant investment with uncertain results to achieve the knowledge possessed by Brown and Caldwell.

Staff believes that Brown and Caldwell's qualifications are equal or superior to any of the other firms. Qualifications are based on: 1) relevant experience, the qualifications of the project manager and team members assigned to the project, 2) understanding of the specific issues of concern, and 3) ability to meet City needs, within the City-defined budget and timeline. The

team proposed by Brown and Caldwell consists of experts familiar with the City's complex treatment processes and would likely be superior to teams that may be proposed by the other consultants for the proposed TF/SC system.

The fee negotiated with Brown and Caldwell is \$3.0 million for the basic services to be provided. The sum of \$400,000 is also included for additional services that may be needed during design. This complex project involves design of new plant facilities, as well as integration of the new facilities with and rehabilitation of existing facilities. The site is congested, and the location of some of the aging underground infrastructure is not fully known, making it difficult to anticipate in advance all of the tasks needed to achieve a complete and workable design. All additional services will have to specifically be directed and authorized by staff.

Brown and Caldwell is proposing to use MBE/WBE subconsultants as part of the consulting team. The combined fee for the MBE/WBE subconsultants will be 10 percent of the proposed total fee.

Analysis of the Brown and Caldwell proposal shows the total fee (less additional services) is about 14 percent of the estimated construction cost. This is considered to be in the higher range of the ratio of consultant to construction costs. Included in the total fee, however, are services not directly associated with design and construction. The consultant will provide services to fulfill CEQA considerations and provide a plant operations manual. The operations manual represents about 7 percent of the total fee. Considering the complexity of designing sewage processing plant, particularly with retrofits to an existing plant, the percentage of construction cost can be considered as reasonable. Another way to view the reasonableness of design cost is to consider costs of plans, specifications, and bidding services as a percentage of construction costs. This portion of the fee amounts to about 9.5 percent of the construction cost and is within the rule of thumb of 8 to 10 percent.

Brown and Caldwell's unit labor charges are comparable with other like-size consulting firms in the Bay area. Because other proposals were not received, direct comparisons for total design costs are not possible. However, Brown and Caldwell has acquired knowledge superior to other potential firms for the combination of the existing facility, the proposed AWT, and proposed Phase I modifications. Because of their superior knowledge and competitive labor rates, staff believes that the total fee proposed would likely be comparable to the fee charged by other consultants for the proposed scope of work.

### **Project Cost**

The estimated costs for this project are as follows:

Design and Administration	\$ 3,800,000
Construction	21,500,000
Construction Inspection and Administration	<u>570,000</u>
<b>Total</b>	<b>\$25,870,000</b>

**Funding:**

The adopted 5-Year Capital Improvement Program includes in the Sewer Capital Improvement Fund and WPCF Replacement Fund \$25,870,000 for the Phase I improvement projects.

**Schedule:**

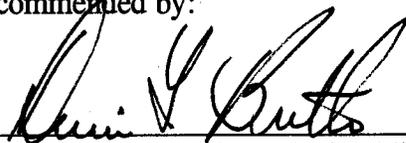
The following preliminary schedule has been established for these projects:

Start design	January 2002
Design completion for fast-track Phase I components	October 2002
Award construction contract for fast-track Phase I components	December 2002
Complete construction of fast-track components	November 2003
Design completion for remaining Phase I components	November 2003
Award construction contract for remaining Phase I components	January 2004
Construction Completion	March 2006

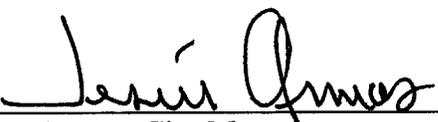
Prepared by:

  
Alex Ameri, Deputy Director of Public Works/Utilities

Recommended by:

  
Dennis L. Butler, Director of Public Works

Approved by:

  
Jesús Armas, City Manager

Attachment: Exhibit A - Project Location Map

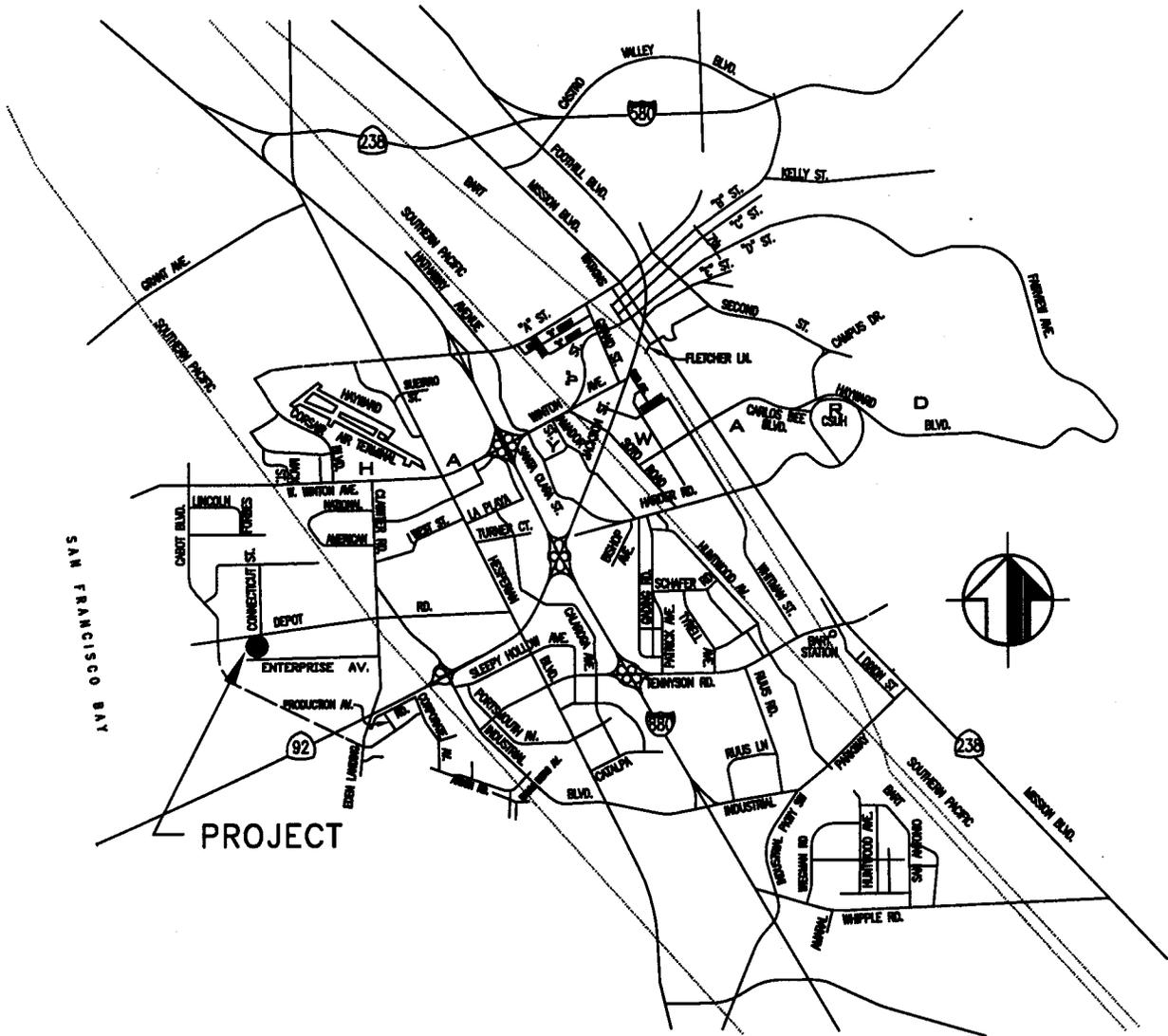


EXHIBIT A  
PROJECT LOCATION

**DRAFT**

HAYWARD CITY COUNCIL

RESOLUTION NO. \_\_\_\_\_

Introduced by Council Member \_\_\_\_\_

*mnf*

RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE A PROFESSIONAL DESIGN SERVICES AGREEMENT BETWEEN THE CITY OF HAYWARD AND BROWN AND CALDWELL FOR THE WATER POLLUTION CONTROL FACILITIES IMPROVEMENTS-PHASE I, PROJECT NOS. 7512, 7513, 7514, 7515 AND 7651

BE IT RESOLVED by the City Council of the City of Hayward that the City Manager is hereby authorized and directed to execute on behalf of the City of Hayward an agreement with Brown and Caldwell to design Phase I improvements and provide services during construction of the Water Pollution Control Facility Improvements, Project Nos. 7512, 7513, 7514, 7515 and 7651 in an amount not to exceed \$3,400,000 in a form to be approved by the City Attorney.

IN COUNCIL, HAYWARD, CALIFORNIA \_\_\_\_\_, 2001

ADOPTED BY THE FOLLOWING VOTE:

AYES:

NOES:

ABSTAIN:

ABSENT:

ATTEST: \_\_\_\_\_

City Clerk of the City of Hayward

APPROVED AS TO FORM:

\_\_\_\_\_  
City Attorney of the City of Hayward