Request for Proposals

Aeration Basin Improvement Predesign and Design Project
Project Number WD1401

You are hereby invited to submit a proposal for consulting services necessary to provide the City of Medford Regional Water Reclamation Facility (RWRF) with the predesign and design of aeration system improvements. Improvements include the installation of a new blower, modification of the air diffusers and associated piping and other aeration basin improvements that may be necessary for improved operations.

Background

The Medford Regional Water Reclamation Facility (RWRF) provides sewerage service to the cities of Medford, Central Point, Jacksonville, Talent, Phoenix, Eagle Point, and the unincorporated areas of the County with sewer service. Rogue Valley Sewer Services is responsible for the interceptor sewer system and for wastewater collection for the cities of Phoenix, Jacksonville, Talent, Central Point, Eagle Point, unincorporated areas, and the White City Sanitary District. Medford is responsible for the collection system within its boundaries.

A facilities plan was completed for the plant in June of 2012 and elements of that plan have been implemented. The Oregon Department of Environmental Quality (DEQ) issued a revised NPDES permit in November 2011 and the plant is currently operated under the requirements of this permit.

Nitrification is required at RWRF from June through October. Since the Oregon water quality standards for ammonia will be reviewed and modified before the next NPDES permit is issued to Medford, the impact of the new standard is not known at this time. The Facilities Plan included an evaluation for a more stringent ammonia discharge requirement and the recommended improvements in the plan are based on the more stringent discharge limitation.

In 2013 the Rogue Fly Fishers & Federation of Fly Fishers commissioned a study completed by Rick Hafele on the Medford outfall. This study entitled “Medford Regional Water Reclamation Facility Outfall Assessment Study” concluded that the discharge has a negative effect on the biological conditions in the river. The City conducted a comprehensive outfall study to define the outfall condition, effluent plume characteristics and the impact of the discharge on the biological conditions. This recently completed outfall study evaluated the biological diversity of benthic taxa downstream of the outfall
and found that nutrients may affect nearby biological conditions. While not conclusive, the conditions in the plume may be nitrogen limiting.

The long term requirements of nutrient removal are uncertain. Because the existing ammonia requirement is less stringent than anticipated, the existing aeration basins are expected to suffice for several years. However, if nutrient removal is mandated in the future, biological nutrient removal needs to be accommodated.

At this time the RWRF can provide full secondary treatment for up to 65 mgd. When the peak flow is in that range, some of the dilute primary effluent is routed directly to the chlorine contact basin. Because this Mode of operation is used infrequently, it will continue to be used in the future for extreme peak flow events. The secondary treatment capacity will need to be increased in the future to allow treatment of up to the maximum day flow.

**Scope of Services**

The scope of work includes the predesign, design and engineering services during construction for the installation of a new blower, reconfiguration and replacement of some of the fine bubble diffusers and basin configurations such as baffles and recirculation required for near term nitrification and stable operation. Included in the predesign are process modeling to define future basin configurations for a higher level of nitrification, denitrification and biological phosphorus removal and completion of a hydraulic profile of the plant.

**Blower**

The existing Hoffman blowers are inefficient and unable to provide air at the requisite pressure for optimum air transfer in the aeration basins. As part of this project, one new blower should be installed that is compatible with the existing Turblex blower. The higher discharge pressure of the new blower will allow more efficient use of the existing diffuser system in the aeration basins. The new blower will replace both existing Hoffman blowers and can be installed in the vacated space. The new blower should be a high efficiency blower similar to the exiting Turblex and include automated dissolved oxygen control.

**Diffuser Modifications**

The existing aeration basins need to be upgraded so the diffusers in both existing basins are moved to a lower, more efficient elevation. It should be possible to lower the existing diffuser grid in basins A3 and A4 with only minor modifications to the existing piping. However, the tube diffusers in basins A1 and A2 will need to be replaced with fine bubble diffusers at the optimum elevation in order to maximize efficiency in these basins.
In addition, the configuration of the header air piping needs should be revised so a separate supply is available for both A1 and A2.

Hydraulic Profile

A comprehensive hydraulic analysis of the plant has not been completed in many years. The addition of baffles for selectors could affect the plant hydraulics and cause a hydraulic bottleneck in the aeration basins. A comprehensive hydraulic evaluation of the plant is needed as part of this project. The objective of hydraulic evaluation is to plan the upgrade of the existing aeration basins and the new future aeration basin so the entire peak flow can be routed through the plant without intermediate pumping. A new hydraulic profile should be developed that shows the condition once the existing aeration basins are modified and once the new aeration basin is added along with additional secondary clarifiers. The following conditions will need to be addressed:

- Hydraulic profile under existing conditions. The calculated hydraulic profile will need to be verified based on surveyed water surface elevations during peak flow conditions at all key points along the profile.

- Hydraulic profile with new baffles in existing basins as shown in the facilities plan with mixed liquor recirculation to maximize nitrification. This arrangement should include the sixth secondary clarifier and assume a peak flow through the basins of 75 mgd with the balance of the peak primary effluent routed to the chlorine contact basins.

- Hydraulic profile with the new aeration basin, modification of the existing basins and additional secondary clarifiers to accommodate nitrification, denitrification and biological phosphorus removal.

- Hydraulic profile for the recommended configuration for the initial improvements based on the process evaluation completed as part of the predesign.

Process Evaluation

Plant performance under existing conditions has been very good and the expectation is that the plant will continue to perform well until the average dry weather flow increases to the design flow of 20 mgd. The objective for this process evaluation is to be prepared in the event that treatment requirements become more stringent. This could include more stringent ammonia limits or the imposition of nitrogen or phosphorus limits. Key factors and objectives for this evaluation include the following:

- Operation of the existing trickling filter will continue.

- The conceptual plant layout should be preserved to maintain site efficiency.
• Ammonia limits may become more stringent in the next permit. The City will provide the anticipated future ammonia limit. Based on this limit, what is the recommended configuration of the existing aeration basins including the distribution of diffusers, baffles, mixers and recirculation equipment if necessary? The phasing of the improvements should also be addressed. Both existing flow and 2035 flows should be evaluated.

• Basin configuration for nitrification and biological phosphorus removal.

• Basin configuration for nitrification and denitrification.

• Basin configuration for nitrification, denitrification and biological phosphorus removal.

The configurations for nutrient removal should be modeled to a level of detail for a layout that has enough detail to assess the future plant layout should these requirements be imposed.

Predesign

A preliminary design report is required that presents the complete findings of the evaluations. A draft report will be required and City comments will be incorporated into the final design report. A meeting to review findings will be conducted by the consultant at RWRF. In addition to the findings of the evaluations, preliminary drawings are required for the blower installation, diffuser modifications, aeration air piping and any other aeration basin modifications. A drawing with the hydraulic profile will also be required. The following sections of the report are required.

1. Summary of flows, loads and effluent requirements

2. Process Evaluation

2.1. Process model and calibration

2.2. Alternatives evaluated including schematics and layouts

2.2.1. Existing conditions

2.2.2. Nitrification

2.2.3. Nitrification with biological phosphorus removal

2.2.4. Nitrification and denitrification

2.2.5. Nitrification, denitrification and biological phosphorus removal
3. Hydraulic Profile

3.1. Description

3.2. Verification

3.3. Hydraulic profile for alternative layouts consistent with the process evaluation

3.4. Hydraulic profile for the recommended first phase improvements

4. Phase 1 Improvements

4.1. Description

4.1.1. Blower

4.1.2. Diffusers

4.1.3. Piping

4.1.4. Others

4.2. Preliminary drawings

4.2.1. Equipment Plan and Profile

4.2.2. Piping

4.2.3. Process and Instrumentation Diagram

4.3. Evaluation of Blower options

4.3.1. Description

4.3.2. Equipment cuts

4.3.3. Capital Cost and Life cycle costs

4.3.4. Recommendations

4.4. Construction Cost Estimate for the recommended improvements

4.5. Implementation

4.5.1. Construction sequence

4.5.2. Schedule
Design

1. Prepare 50-percent documents
   1.1. Drawings
   1.2. Specifications
   1.3. Cost Estimate

2. Conduct project review meeting with the City

3. Prepare 90-percent documents
   3.1. Drawings
   3.2. Specifications
   3.3. Cost Estimate

4. Conduct project review meeting with the City

5. Prepare camera ready design documents
   5.1. Provide sealed documents in both paper and electronic format per City specifications

6. Provide final engineers construction cost estimate

Bid Services

1. Respond to bidder inquiries

2. Attend and participate in the pre-bid conference

3. Assist in the preparation of addenda as required

4. Review bid and provide recommendations for award

Engineering Services During Construction

1. Attend pre-construction conference

2. Review submittals

3. Respond to contractor questions and RFIs

4. Assist with preparation of change orders
5. Make periodic site visits and assist in development of the final punch list
6. Prepare operation and maintenance manual
7. Prepare record drawings and provide electronic versions per City specifications.

The Proposal

The proposal submitted must be limited to twenty pages in length and include, as a minimum, the following:

1. The consultant shall walk through the RWRF to become familiar with the RWRF and its processes. If the consultant is familiar with plant layout, indicate the date and on what project a walk through was previously completed.
2. A detailed description of the scope of work to be performed by the consultant, an estimated project schedule with completion date.
3. A description of the consultant’s understanding of the project and the methodology proposed to develop the recommendations for the project.
4. A listing of the project manager and all key personnel to be utilized on the project and their relevant experience.
5. A statement from your firm showing your experience on similar projects in performing all phases of the consulting services being requested, complete with a reference list of former clients who benefited from your work. Also a description of any unique designs for projects involving the facilities described in this Request for Proposals.
6. A list and description of the detailed tasks, and estimated number of hours for each of the personnel to be used during all phases of the project.
7. A list and description of tasks, qualifications, key personnel, and responsibilities of any subconsultant’s who may be hired by the consultant for the project.

Your firm is encouraged to revise or improve this Request for Proposals including all Exhibits and to make subsequent modifications of the proposal before submission. However, all information requested herein shall be provided.
Time and Place for Receiving Proposals

Six copies of the proposal are to be submitted to the office of the WRD Construction Manager, 1100 Kirtland Road, Central Point, Oregon 97502 by 4:00 PM, Thursday, May 22, 2014.

Selection Process

A Selection Committee will evaluate the proposals submitted. The need for formal interviews will be at the discretion of the Selection Committee. The Selection Committee will rank up to three firms that are determined to be most qualified strictly on a merit basis. The following factors will be used to evaluate the proposals:

- Consultant knowledge and familiarity with the RWRF and working relationship with RWRF staff

- Consultant's key personnel experience with modeling of activated sludge and nutrient removal processes including the influence of the trickling filter, experience with design of aeration improvements, design of state of the art blower system, design of nutrient removal and plant hydraulic evaluations.

- Consultant's understanding of the overall scope and objectives of the project

- Consultant experience performing similar work at similar wastewater facilities

- Consultant references of former clients for whom similar work was performed

- Consultant commitment to client service and client involvement

- Consultant's organization and completeness of the required project tasks as listed in the RFP

- Did Consultant include an estimated number of work hours to complete the project?
The most qualified firm will be invited to negotiate their proposed fee for consulting services. Fee negotiations will be held with the Consultant’s authorized representative and the WRD Administrator and/or Construction Manager. In the event that no mutual agreement can be reached, the negotiations will be terminated and the second most qualified firm will be invited to negotiate their proposed fee.

Upon agreement to the fee for services and appropriated administrative action, the contract will be awarded.

**Contact Person**

For questions or additional information regarding this Request for Proposals, please contact Tom Suttle, WRD Construction Manager at (541) 774-2750, or write to the Medford Regional Water Reclamation Facility, 1100 Kirtland Rd., Central Point, OR 97502.

Please do not attempt to contact any member of the Selection Committee. Such contact may disqualify your proposal.