



City of Biggs

Agenda Item Staff Report For the Regular City Council Meeting: November 12, 2013

TO: Honorable Mayor and Members of the City Council
FROM: City Administrator
SUBJECT: Purchase Authority for Waste Water Aerators

Council is asked to grant purchase authority to the City Administrator for the repair of, or for the replacement of (2) waste water aerators and installation labor and materials.

Background

Please see the attached staff report from October 8th for additional background.

In October, Council authorized the replacement of 2 of the 4 WWTP aerators with VaraCorp air turbine aerators. The new aerators were installed on Monday October 28, 2013, and appear to have been functioning properly since their installation.

Immediately prior to the installation of the two new aerators, the last two remaining old aerators failed. This presents a decision about whether to repair or replace the aerators.

- Repair estimate is approximately \$3,000.00
- Replacement with the new air turbine aerators is approximately \$11,000

Unfortunately, the old water impeller driven aerators have clearly demonstrated that they are inefficient and unreliable in Biggs's un-screened WWTP ponds. The replacement of the old aerators was planned to occur during the WWTP facility upgrades. While we had hoped to have more time to evaluate the effectiveness of the air turbine aerators, the failure of the old aerators has presented a decision point.

Recommendation:

Authorize the City Administrator to purchase and install (2) 3 HP VaraCorp Turbine Aeration units with the cost of materials and labor not to exceed \$14,000, and to increase the Sewer Operating Fund expense budget line item 030-1232 "Plant & Pump repair & maintenance" by \$14,000 to accommodate the purchase.

Mark Sorensen, City Administrator

From: Grant Stanley [mailto:gstanley@cpmpump.com]
Sent: Wednesday, November 06, 2013 4:29 PM
To: Mark Sorensen; Paul Pratt
Subject: RE: Aerators

Mark,

Attached is a bid for complete rewind and refurbish of the 2 Toshiba motors. After tearing them down and inspecting the motors a complete rewind is necessary.

One motor appeared to fail because it is was full of grease which caused the insulation to swell. The other motor appeared to fail to simple over load most likely due to debris wrapped around the propeller.

These motors are not available at all. I've checked with the plant and other after market sources. We have discussed the options to use a different motor which would require a separate coupler, shaft and bushing. It is possible to "redesign" the motor/drive shaft assembly but it would probably be cost prohibitive.

I discussed the grease situation and we can either put sealed bearings in or it would be necessary to grease the motors only twice a year at regular intervals.

Based on our conversation we have proceeded to extract the broken studs from the pontoon and are in the process of machining the 2 broken "spacer studs". It is our opinion that complete dip/bake/rewind/refurbish is the most cost effective solution. Please email or call my cell to discuss further.

Thank you, Grant



COMMERCIAL
PUMP & MECHANICAL INC.

11254 Midway | 530.899.1583v
Chico CA 95928 | 530.899.7225f

November 6, 2013

Paul Pratt
Public Works Superintendent
City of Biggs
465 C Street
Biggs, CA 95917

RE: Bid for Rewind/Refurbish of 7.5 HP Toshiba 1800 RPM Electric Motor

1 – 7.5 HP 1800 RPM Toshiba Electric Motor 213TDZ Frame, Labor and Parts to Recondition And Rewind, Including Replacement of Bearings, Test and Paint, Sales Tax (7.5%) Included	\$ 1,151.30
---	-------------

Thank you for the opportunity to quote and for your confidence in Commercial Pump and Mechanical.

Grant Stanley
Commercial Pump & Mechanical, Inc.

THIS IS PER MOTOR



City of Biggs

Agenda Item Staff Report For the Regular City Council Meeting: October 8, 2013

TO: Honorable Mayor and Members of the City Council
FROM: City Administrator
SUBJECT: Purchase Authority for Waste Water Aerators

Council is asked to grant purchase authority to the City Administrator for the purchase of (2) waste water aerators and installation labor and materials.

Background

In August the City's long standing challenges with the WWTP (Waste Water Treatment Plant) facultative pond aerators reached a new level with the failure of 2 of the 4 aerators. Because of the complete lack of screening of the influent, any material introduced into the waste water system flows unabated into the ponds. With decades of accumulation of various types of modern, strong, fibrous materials in the ponds, clogging of the aeration pumps has been a very significant problem for many years. Even with the installation of an influent screen in the Phase 1 WWTP project, under the timeline of the Phase 2 WWTP project it will be at least 2-years before the ponds can be cleaned of debris. And a funding source has not yet been identified for this maintenance function.

The failure of the aerators appears to be the result of age and metal fatigue, but is clearly exacerbated by impeller imbalance created when the never ending, significant amounts of fibrous debris in the ponds become entangled in the impellers. This near constant state of imbalance caused structural failure, and the debris spinning on the impellers wore through the metal volute of the impeller housing and into the floatation material of the float.

For these reasons, repair of the existing aerators or replacement with aerators of the existing type is not a viable option. City staff began a search for methods of delivering oxygen to the ponds that could successfully and economically operate in the existing circumstances. Two primary types of aerators emerged for consideration, one is a rotating brush, and the other is an air turbine. While the air turbine (Toring Turbine) has been used in Europe for years, it is relatively new to the US, being distributed by VaraCorp. Further details have been the subject of many weekly updates, and are also detailed in the attached Technical Memorandum.

On paper the air turbines have lower initial cost, and utilize about 1/2 of the energy to accomplish a greater level of aeration than the aerators currently in use at the

WWTP, and purport to do so without the clogging issues. The air turbines are about 1/3 the cost of rotating brush aerator designs that claim to be "clog free", have far fewer moving parts, and appear to require much less maintenance.

There is some concern that the air turbines might be too good to be true, and the manufacturer has not yet gone through the expense of independent testing to substantiate their claims about oxygen delivery. One interesting prospect that is being explored involves the possibility of CSU Chico and/or UCLA testing the performance of the air turbine.

Discussions with two separate plant operators in plants of similar size to Biggs where the air turbines were deployed were very enthusiastic about endorsing their performance. Both plants suffered from clogging issues with aerators of similar design to Biggs', and reported complete elimination of the clogging issue. One plant replaced 20 HP aerators with 3 HP air turbines and measured increases in DO (Dissolved Oxygen), and enjoyed a significant reduction in electricity usage. The other plant replaced 7.5 and 9 HP aerators with 3 HP air turbines and reported a very dramatic increase in DO.

Considering all of these factors the Public Works Committee supports the purchase of (2) of the 3 HP VaraCorp air turbines to replace the (2) failed aerators at the WWTP.

While CSU Chico and UCLA have indicated an interest in testing the aerator performance, at a minimum we intend to track DO (Dissolved Oxygen) levels in the ponds before and after the new aerators are installed. However, because the ponds have been starved of oxygen for so long, it is likely that there is an abundance of unprocessed solids and that DO consumption will be high for some time as aerobic digestion is increased within the ponds, until they eventually reach a new equilibrium.

The goal at this juncture is to replace both of the failed aerators as soon as practical, and then replace the remaining two aerators during the phase 1 WWTP project.

Recommendation:

Authorize the City Administrator to purchase and install (2) 3 HP VaraCorp Turbine Aeration units with the cost of materials and labor not to exceed \$14,000, and to increase the Sewer Operating Fund expense budget line item 030-1232 "Plant & Pump repair & maintenance" by \$14,000 to accommodate the purchase.

Mark Sorensen, City Administrator

WRIGHT

ONE ELECTRIC

P.O. BOX 401 YUBA CITY, CALIFORNIA 95992 PH. (530) 755 - 4444 FAX (530) 755-4446 LIC. #817489

PROPOSAL

September 27, 2013

Project Owner: The City of Biggs.

Project Description: Aerator Pumps.

Project Location: Biggs, Calif.

Wright One Electric is pleased to have the opportunity to be bidding on your project.

Wright One Electric is proposing to:

- Provide and install conductors (SO cord), from the shoreline J-Box to the new Aerator VFD panels.
- Provide and install motor lead conductors (SO cord), from the new Aerator VFD panels to the new Aerator Pumps

Wright One Electric's proposal includes all labor and material for a complete and operable system.

Proposal excludes, Aerator pumps, VFD Control Cabinets and the mounting of the VFD Control cabinets.

For the sum of:

Including the SO cord.	\$1,915.00
Excluding the SO cord.	\$1,268.00