

**SELMA-KINGSBURG-FOWLER  
COUNTY SANITATION DISTRICT  
MINUTES OF THE MEETING OF THE  
TECHNICAL ADVISORY COMMITTEE**

**MEMBERS ROLL CALL**

Darren Hays, Kingsburg (present)  
Alan Weaver, County of Fresno (present)  
Arshavir “Archie” Moonsakhanian, City of Selma (present)  
David Weisser, City of Fowler (present)

**STAFF AND CONSULTANTS PRESENT**

Ben Muñoz, Interim General Manager  
Michael Fong, Chief Accountant  
Veronica Cazares, Supervising Engineer  
Scott Aguiar, Plant Operations Supervisor  
Gabriel Jimenez, Asst. Plant Ops. Supervisor  
Robert Whitley, Consulting District Engineer

**OTHERS PRESENT**

**APPROVAL OF MINUTES**

Interim General Manager Muñoz reported that Director Cárdenas applauded DTAC committee for their work performed on SKF issues at the last DTAC meeting.

There being no comments from the public, the minutes of the meeting of August 20, 2008, were approved on a motion duly made by Committee Member Hays, seconded Committee Chairman Weaver, and approved by unanimous vote of all members present.

**PUBLIC COMMENTS**

None.

**UNFINISHED BUSINESS**

None.

**NEW BUSINESS**

**Aerobic Digester # 1 “Demo” Brush Aerator Pilot Study**

Interim General Manager Muñoz apologized to the committee for not having the Brush Aerator final report in the agenda package, because it was not completed at the time the agenda was sent out. However, staff wanted to get this project moving forward.

Bob Whitley gave the history and function of the digesters. He reported that the digesters 1 & 2 were constructed for different purposes. He said in the 70's the ponds were adapted to digesters. The main reason the digesters are not working is because these ponds were converted over a state grant, therefore the 1975 configuration was insufficient. In the mid 80's coarse bubble diffusers were added to increase the efficiency of aerobic digester 1 and 2. However, the sloping sides created dead zones. These dead zones created odorous problems. Additional supplemental mechanical equipment was added with limited results. The brush aerators that are being introduced will get rid of the dead spots.

At the meeting of September 17<sup>th</sup>, Interim General Manager Muñoz and staff presented the results and recommendations of the aerobic digester # 1 (AD1) "demo" brush aerator pilot study.

District staff recently received a "demo" brush aerator. The unit was placed in aerobic digester 1 (AD1) to aid in mixing the "dead spots" in the basin. Operations is performing a dissolved oxygen (DO) profile of the basin to determine if the brush aerator is providing DO and complete mixing in the basin. The Operations Department is also experimenting with the air flow to the AD1.

Preliminary information gathered indicates that the brush aerator is mixing the "dead spots" and providing DO to AD1. Also, the air flow to AD1 is being changed to determine the minimum air needed to sufficiently mix and provide DO to the basin. It appears that there is an excess amount of air supplied from one 300hp blower. This is a potential cost savings measurement.

The objective of the brush aerator pilot study was to improve the mixing in aerobic digester 1 (AD1), which in turn enhances DO, and biological treatment, and replace the existing Landia and Flgyt mixers as a supplement to the existing coarse bubble diffusers. Also, better mixing provides the basin with more consistent solids in the sludge and more efficient dewatering.

The issues with the existing mixers are (1) incomplete mixing of basin, (2) unreliable, (3) uneven distribution of DO (operating parameter of 0.5 to 1.0 mg/l) (4) no ease of operation or flexibility, (5) pH below operating parameter of 5.0 to 7.0 (6) odors, (7) high maintenance and chemical costs.

The Operations Department monitored the DO in the basin. The DO was taken at six points around the basin within the first one foot of digester sludge. Readings were taken twice a day and recorded. The DO results were consistent around the basin, an indication that the basin is completely mixed. Sufficient DO in the digester reduces the occurrence of offensive odors. It has been past practice to place a "mask it" around the basins to combat the odors from the digesters. The best method to combat odors is through eliminating the source. By complete mixing of the basin and providing sufficient consistent DO throughout the basin the use of "mask it" is decreased, chemical costs are decreased, and man hours in placing the "mask it" is decreased. Most importantly the potential for public complaints is decreased.

The DO along with temperature affects the pH of digesters. The pH results during the first week of operation of the brush aerator were low and out of the digester operational parameter. Operations made adjustments to the air flow to the coarse bubble diffusers to control the DO levels. Observations made by Scott Aguiar, Plant Operations Supervisor, indicate that there is an excess amount of air being supplied to AD 1 with the addition of the brush aerator and warrants further analysis.

The attached chart shows the relationship between DO and pH. As the DO dropped closer to the operating parameter the pH rose to the appropriate operating parameter. The significance of low pH in the digester is that the biological organisms are adversely affected and digestion becomes inefficient. Prior to this study caustic soda or sodium bicarbonate would be added to raise the pH. Chemical was added on average every 15 calendar days beginning in late April through late August. Chemical costs for 2007 and 2008 were \$29,812 and \$21,146, respectively. It is anticipated that with the use of the brush aerators that the chemical costs would decrease by at least 50%. The last application of chemical was in late August about the same time as the installation of the brush aerator. The use of chemical is an inefficient method to control pH; pH should be controlled by the use of adequate equipment with proper operational control. The existing mixers did not supplement the coarse bubble diffusers sufficiently enough to provide complete mixing nor consistent DO throughout the basin; thereby the pH was consistently out of the operational parameter of 5.0 to 7.0.

When sludge is digested it turns into water, gas, and volatile matter. For an aerobic digester the volatile reduction ranges from 45% to 70%. The reduction in volatile matter equates to a reduction in solids, easier dewatering, decrease in polymer use (centrifuge), increased efficiency of sludge drying beds, and cost savings for solids removal. See table below for a comparison of the volatile solids reduction from June 2008 to mid-September 2008.

The benefits of the brush aerator are that it improves the mixing in AD1, which in turn enhances DO and biological treatment, provides the basin with more consistent solids in the sludge and more efficient dewatering, ease of operations and maintenance, provides operational flexibility, is reliable, cost savings in chemical, power consumption (two 10hp brush aerators vs. six mixers at 5hp each, in AD 1 and AD2), and solids being hauled from the site.

The cost of each brush aerator is \$15,000 and the cost of each Landia mixer is \$12,500. See memorandum dated 9/10/08, Existing Mixer Maintenance and Brush Aerator Pilot Test Preliminary Information for the Landia and Flgyt maintenance history.

The following are the recommendations based on results as outlined above, visual observations, and input from Scott Aguiar, Plant Operations Supervisor, Gabriel Jimenez, Assistant Plant Operations Supervisor, Jimmy Garcia, Maintenance Supervisor, and Ralph Gonzales, Assistant Maintenance Supervisor:

- Purchase four (4) brush aerators to replace 12 mixers for AD1 and AD2.
- Contact PG&E for potential rebates.
- Place DO sensors and associated PLC and programming for automation of the blower air flow.
- Phase I operational changes: Operate AD1 and AD2, four brush aerators, and take AD4 out of service. Phase I operational scheme utilizes 360hp versus 660hp.
- The payback for Phase I of the project is approximately four months excluding PG&E rebates.

## **Phase II**



Bob Whitley asked why are we exclusively going to the House® brush aerators? Veronica Cazares replied the simplicity of the equipment, low maintenance cost, and proven technology.

Committee Chairman Weaver stated you will need to go out with RFP or use the House brush aerators study.

Interim General Manager Muñoz stated the objective and directive from the Board is to move quickly on projects that can save cost.

There being no further comments from the public, a motion to present the Aerobic Digester # 1 “Demo” Brush Aerator Pilot Study to Board and request to prepare a Request for Proposal to procure four (4) brush aerators and authorize staff to solicit sealed bids upon completion of the procurement documents, was made by Committee Member Weisser, seconded by Committee Member Hays, and approved by the unanimous vote of all Committee Members present.

### **COMMUNICATIONS**

Interim General Manager Muñoz invited DTAC members to the BBQ on October 9, 2008, at 11:30 a.m. He also said that the Water Recycle Workshop would be at 1:00 p.m. and the Board meeting would be at 3:00 p.m.

Committee Chairman Weaver said that CID should be invited to the Water recycle Workshop. Interim General Manager Muñoz said we will invite CID.

### **ADJOURNMENT**

There being no further business to come before the Committee, Chairman Weaver declared the meeting adjourned on a motion duly made Committee Member Weisser, seconded Committee Member Hays, and approved by unanimous voice vote at 11:25 a.m.

Respectfully submitted,

Approved,

Ben Muñoz, Jr., Interim General Manager/  
Secretary of the Committee

Alan Weaver, Chairman  
SKF Technical Advisory Committee