

MONTHLY PROGRESS REPORT FOR CONTRACT NO. 500-00-036

PROJECT 2.2 – ENHANCED ENERGY RECOVERY THROUGH OPTIMIZATION OF
ANAEROBIC DIGESTION AND MICROTURBINES PROJECT

REPORT PREPARED BY: COMMONWEALTH ENERGY TEAM

December 2004

Contractor Project Director:	Patrick Lilly (360) 906-0616
Contractor Project Manager:	Bill Kitto (503) 235-5022
Commission Project Manager:	Zhiqin Zhang (916) 654-4063

What we planned to accomplish this period:

It was anticipated that during December testing of the IWe Tech and Sonico ultrasound systems at the City of Riverside Wastewater Treatment Plant would continue. Additionally, baseline data for the gas cleaning tasks at IEUA's Regional Plant Number 1 (RP-1) was to be collected. Data from the first operating period for the ultrasound systems were to be reviewed and the *First Quarterly Report* was to be finalized. It was also anticipated that the "as built" drawings, photographs and letter signed by representatives of the City of Riverside certifying and marking completion of the ultrasound installation task, were to be approved by the Commission and the Task would be officially completed. It was also anticipated that the design of the gas cleaning system would be completed and that steps would be taken to order the necessary equipment and materials for this testing activity for systems to be installed at IEUA RP-1.

Work was to continue on the *First Quarterly Report*. Baseline data related to the ultrasound systems collected in the June through September was to be reviewed by the CE Team and finalized in the *First Quarterly Report*. The data collection on the gas cleaning lags the data collection on the ultrasound systems by two to three months and the first and subsequent quarterly reports will reflect that fact. It was anticipated that the draft *First Quarterly Report* would be completed in December so that it could be submitted to the Commission in January.

What we actually accomplished this period:

Task 2.2.1 Process Selection:

- Work on this task is complete. The results have been incorporated into the design process and are being implemented into the project in the field.

Task 2.2.2 Site Selection and Test Plan:

- Work on this task is complete. The results have been incorporated into the design process and are being implemented into the project in the field.

Task 2.2.3.a. Design Gas Cleaning System:

- Efforts on this task were limited as the design activities were completed previously. Design data and other information on site conditions were incorporated into the design of the gas cleaning systems. Design drawings showing the layout of the various gas cleaning elements (gas drying, H₂S removal and siloxane removal) were finalized with the host (IEUA) staff and used in efforts with the various vendors to ensure that the equipment was properly sized and ordered to meet the requirements of the design. Data related to the size of the piping, electrical, instrumentation/control and other project elements incorporated into the design earlier were finalized and used in working with the equipment vendors to make sure the design was properly implemented.

Task 2.2.3b Design Ultrasound System:

- Design activities were completed on this task previously and the design documents were submitted to the Commission in June. Efforts on this task were very limited with the only activity being the use of the results of this task to complete the “as-built” drawings prepared under Task 2.2.4.b.

Task 2.2.4a Install Gas Cleaning System:

- Using the gas cleaning system design under Task 2.2.3a, installation activities were initiated in December. Design documents provided to the equipment suppliers were reviewed and arrangements made to schedule delivery of the equipment. In addition, consultations were initiated with contractors to install the equipment to be used. Detailed planning for the installation, including coordination with the project host, IEUA was also undertaken.

Task 2.2.4b Install Ultrasound System:

- Installation of the ultrasound systems was completed previously in August, and allowed start up testing to occur in August and September. Work continued with IWe Tech and Sonico, the two ultrasound vendors used on this project under operational tasks. Efforts undertaken in December were very limited.

Task 2.2.5.a First Quarter Data Collection and Analysis

- Baseline data at the City of Riverside's Treatment Plant for the ultrasound systems was collected beginning in June and continuing until September when start up began. For the gas cleaning project, baseline data collection activities began approximately two months later and continued into December. In both cases it was important to have data that described the performance of the existing systems prior to the start of the project. Baseline information was needed to document operating conditions prior to startup so that the effectiveness of the units could be assessed. As part of this effort close coordination with the City of Riverside continued through the bi-weekly calls referenced earlier, as did regular coordination with IEUA. During December the draft of the *First Quarterly Report* was reviewed internally with the CE Team and comments were received and incorporated. The *First Quarterly Report* includes baseline data for the City of Riverside systems used in the ultrasound testing. Additional baseline data related to the gas cleaning project at RP-1 was collected during December, but was not complete and not included in the *First Quarterly Report* review circulated within the CE Team.

Task 2.2.5.b Second Quarterly Data Collection and Analysis

- In December, data collection during the ultrasound system operational phase continued. As noted previously, start up activities occurred during September and some of these problems continued in the initial operations months from October through December for the IWe Tech units. Both vendors, IWe Tech and Sonico, provided technical support during this period so that the units would operate satisfactorily. Overall, the service provided on the Sonico units improved their performance substantially and they were running well during November and December. The Iwe Tech system continued to have performance issues, being down a substantial portion of the time and not performing as well as planned during those periods when operating. On the gas cleaning project, baseline data collection continued and the CE Team worked closely with IEUA host facility staff to coordinate data collection activity with operations. This activity was expected to continue throughout the quarterly data collection efforts. Baseline data collected indicated an unusually large presence of siloxane during the baseline period and the levels and source of siloxane during this period were investigated.

How we are doing compared to our plan:

As reported previously, the redirection of our approach (two ultrasound technologies, instead of one ultrasound and one thermal hydrolysis technology) will make the project findings more relevant to the State of California, but required additional consultation and planning with the technology vendors. This modified focus delayed completion of the *Site Selection and Test Plan Report*. However, the findings produced will clearly document how the use of ultrasound technology can help increase gas production as well as improve the treatment process.

As part of the ongoing coordination with the technology vendors, the CE Team sought to streamline the site selection and design tasks by involving the vendors in the project planning. This allowed efforts to focus on project implementation, rather than evaluations and design activities. However, these additional processes/steps additionally delayed the finalization of the *Site Selection and Test Plan Report*. These challenges have been largely overcome, and the testing program was initiated in the second half of 2004. This will enable all testing to be completed by the end of the third quarter of 2005 with the results incorporated into the final report, which will be drafted by the end of 2005.

Significant problems or changes:

There are no significant fiscal problems to report during this period and work is proceeding within budget. Progress and expenditures will result in project being completed on our revised project schedule and within budget. As noted above and in the previous monthly progress reports, operational issues arose with both the Sonico and IWe Tech units. In the case of the Sonico unit, these issues were addressed and the unit is performing satisfactorily. The IWe Tech unit continues to be down a large portion of the time and is not performing as anticipated. Additional consultation with the vendor will occur, and options for concluding the test will be considered. In general, results to date suggest that the IWe Tech unit is not performing satisfactorily and it that it will be difficult for the unit to be able to produce the results anticipated even if its operational reliability can be improved. The preliminary results of the testing suggest that future ultrasound applications should use the Sonico system, with its smaller sonic horns than the larger units on the IWe Tech units.

What we expect to accomplish during the next period:

Testing of the IWe Tech and Sonico ultrasound systems at the City of Riverside Wastewater Treatment Plant will continue in January. Also baseline data for the gas cleaning tasks at IEUA's Regional Plant Number 1 (RP-1) will continue to be collected. Data from the first operating period for the ultrasound systems will be reviewed and the *First Quarterly Report* will be submitted. It is also anticipated that documents marking completion of the ultrasound installation task will be approved by the Commission and that Task will be officially finished.

The CE Team anticipated that the steps to initiate the design of the gas cleaning system will be completed and that coordination with vendors supplying the equipment would continue. It is also planned that installation activities related to the gas cleaning system will continue for the systems to be installed at IEUA RP-1. Work will continue in order to complete the *First Quarterly Report* which will include baseline data, prior to submittal to the Commission. Baseline data related to the ultrasound systems which were collected in the June through

September and summarized and reviewed by the CE Team, will be finalized into the *First Quarterly Report*. The data collection on the gas cleaning lags the data collection on the ultrasound systems by two to three months and the first and subsequent quarterly reports will reflect that fact.

Status of Milestones and Deliverables:

Table 1 below summarizes the status of Project 2.2 task deliverables as of the end of the current reporting period.

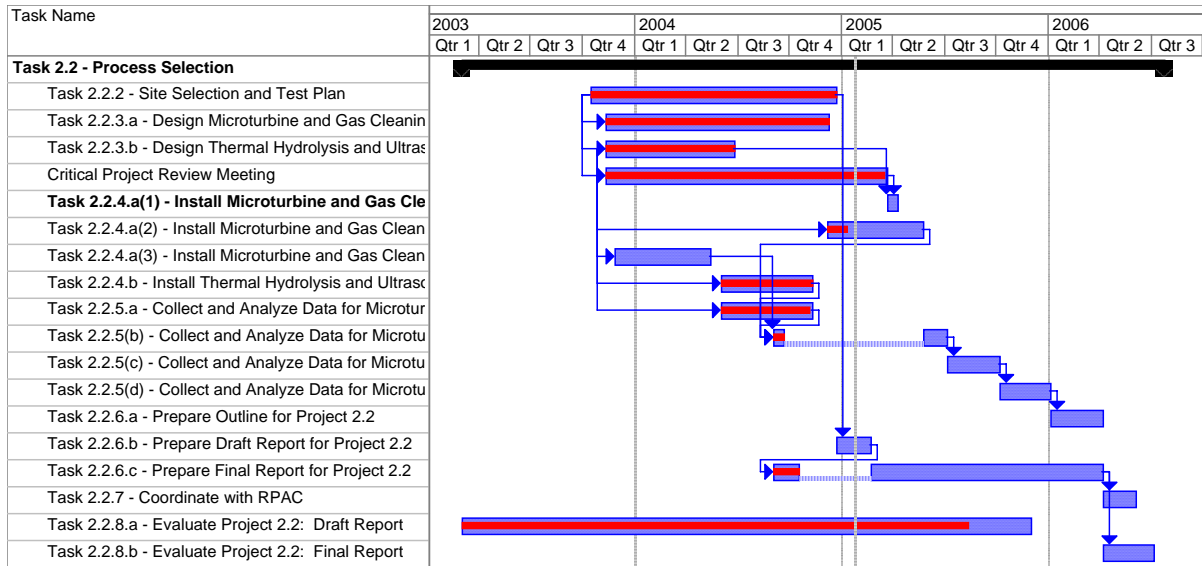
Table 1: Summary of Project Status and Deliverables – Project 2.2

Task No.	Description	Start Date		Due Date		Status (%)
		Planned	Actual	Planned	Actual	
2.2.1	Process Selection	01/24/02	01/24/03	09/04/03	11/10/03	100%
2.2.2	Site Selection and Test Plan	02/15/02	10/15/03	10/26/03	3/31/04	100%
2.2.3.a	Design Gas Cleaning System	02/15/02	11/10/03	11/24/03	11/12/04	95%
2.2.3.b	Design Ultrasound Systems	02/15/02	11/10/03	11/24/03	6/23/04	100%
2.2.4.a	Install Gas Cleaning System	12/5/03	12/4/04	5/21/04		20%
2.2.4.b	Install Ultrasound System	12/5/03	6/1/04	5/21/04	11/09/04	100%
2.2.5.a	First Quarterly Report	6/20/04	6/1/04	8/20/04		95%
2.2.6.b	Second Quarterly Report	8/20/03	9/1/04	11/19/04		30%
2.2.7	Coordinate with RPAC	01/24/02	2/1/03	01/16/06		95%

Explanation of any Difference(s) in Schedule:

Task 2.2.2 – Site Selection and Test Plan – The findings of the Process Selection Report identified the technologies that are to be used at the Riverside plant for enhanced anaerobic digestion and at RP-1 for gas cleaning. As noted previously, additional coordination activities with vendors has been required. Efforts were undertaken to streamline the site selection and test plan and design processes by conducting more detailed coordination with the vendors on their technologies. This approach shortened the time needed to secure the long lead-time equipment items and execute the project most efficiently

Overall Schedule for Project 2.2:



Overview of Fiscal Status:

Table 2 below summarizes the fiscal status of Project 2.2 by task as of the end of the current reporting period.

Table 2: Fiscal Status by Task – Project 2.2

Task Number	Budget	Invoiced¹ To-Date	Fiscal Status *
2.2.1	\$236,563	\$236,563	OT
2.2.2	\$182,543	\$182,543	OT
2.2.3.a	\$242,995	\$	OT
2.2.3.b	\$215,842	\$215,842	OT
2.2.4.b	\$229,585	\$0	OT
2.2.5.a	\$87,073	\$0	OT
2.2.5.b	\$87,073	\$0	OT
2.2.7	\$22,557	\$0	OT

*Fiscal Status – Please indicate if you are “On Track” (OT), OverBudget (OB), or UnderBudget (UB)

¹ Invoice to-Date refers to amount invoiced prior to 10% retention withheld.