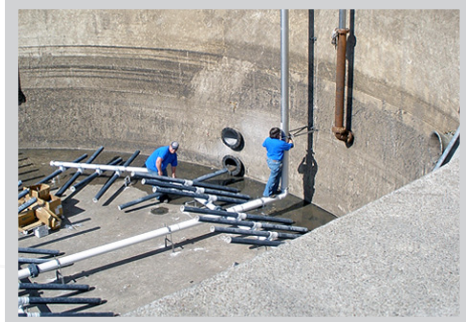


# CASE STUDY:

## CITY OF BOWLING GREEN, MO

START-UP DATE MARCH, 2010



### PROBLEM FACED

Contract wastewater operators (Alliance Water Resources) for the City of Bowling Green, MO desired to reduce overall operating costs at the facility. The existing positive displacement blowers, jet aeration system and motive mixing pumps were targeted for evaluation and potential upgrade. To achieve these goals, the city looked to Alliance Water Resources (AWR) and to Environmental Dynamics Inc. (EDI) for answers.

### EDI'S SOLUTION

AWR partnered with EDI to improve on the plant's current aeration system. AWR and EDI analyzed the existing system against a fixed grid, fine bubble membrane aeration system for the two aeration basins. The energy savings of the fine bubble system and corresponding return on investment looked very attractive. AWR applied for, and obtained, an energy efficiency grant from the local electrical company to help pay for the conversion.

EDI replaced the plant's jet aeration system with 96 FlexAir® MiniPanel™ fine-bubble tube diffusers in each of the plant's aeration basins. The increased oxygen transfer capabilities of the fine bubble system compared to the jet aeration system results in a reduced overall airflow requirement. The blowers were also outfitted with variable frequency drives (VFDs) linked to dissolved oxygen meters which allows for efficient pacing of the blowers to meet plant loading dynamics.

### TESTIMONIAL

"We were very pleased with EDI's work," Daniel Gummersheimer, Division Manager for Alliance Water Resources said. "From the proposal to the installation, there were no hiccups. Their design and products worked perfectly from the first time we turned the blowers on. Everything went very smoothly."

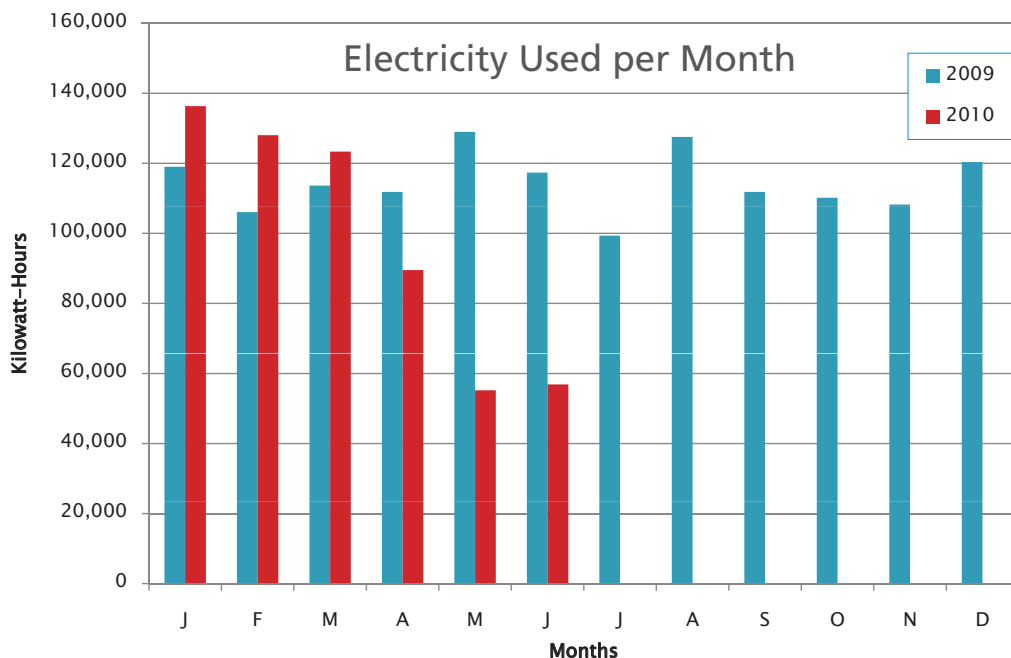


Environmental Dynamics International  
[wastewater.com](http://wastewater.com)

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## OUTCOME

With AWR's improvements to the plant's current blowers and EDI's fine-bubble aeration system in place, electric consumption **dropped by 40 percent per month** on average. Before the project, monthly energy consumption for the plant averaged 117,480kWh. After the project was complete, the plant's monthly energy consumption on average measured only 65,897kWh. The city expects a payback on the investment well before their three-year projection.



### Before Improvements

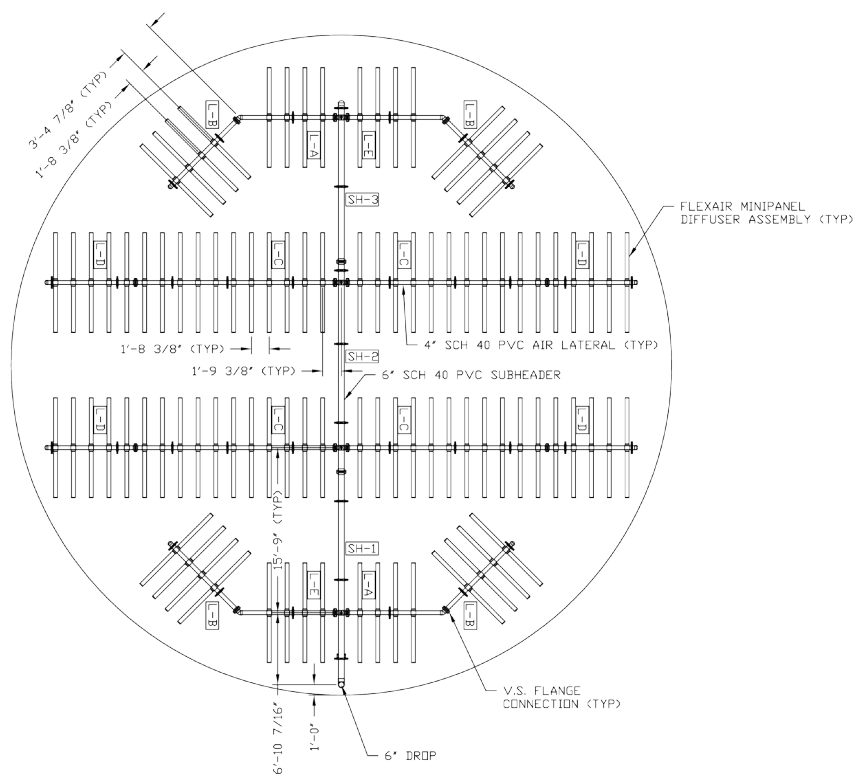
- Median kW-hrs/month= 117,360
- Median \$/month= \$5,495.04
- Average kW-hrs/month= 117,480
- Average \$/month= \$6,215.11

### FY 2009 - March 2010

### After Improvements

- Median kW-hrs/month= 57,720
- Median \$/month= \$4,890.32
- Average kW-hrs/month= 65,040
- Average \$/month= \$4,564.81

### April 2010 - Present



## EFFLUENT COMPLIANCE

### 2009

	March	April	May	June
BOD	4.4	4.5	3.5	3.4
TSS	6.1	5.2	2.7	2.9
Flow (MGD)	0.805	0.988	0.927	0.728
pH	6.6	6.7	7	7
NH <sub>3</sub>	0.13	0.49	0.55	0.2
Temp	13	14	18	21
O&G	2.0	2.6	1.5	1.3

### 2010

	March	April	May	June
BOD	6.5	2.9	2.9	3.8
TSS	7.6	3.9	3.7	5.6
Flow (MGD)	1.045	0.944	0.914	0.801
pH	6.7	6.7	6.6	6.8
NH <sub>3</sub>	<0.015	<0.015	0.126	0.08
Temp	12	17	19	23
O&G	0.9	1.0	0.6	0.7