



PROCESS

SITE STATS:

Average Daily Flow: .2 MGD
 Population Served: 2,000
 Location: Central Ohio
 Water Temperature: Avg. Low (1°C), Avg. High (20°C)

PERMIT(S):

- Ammonia (2.2 mg/L – May thru Oct)
- Ammonia (6.1 mg/L – Nov thru Apr)
- BOD₅ – 10 mg/L
- Fecal Coliform – 200 mpn/100 ml

RATIONALE FOR AQUAMATS® PROCESS UPGRADE:

During 2000, the City of Laurelville determined that improvements were necessary and began active efforts to improve facility performance to benefit the environment and position the City for compliance with state and federal regulations and also the more aggressive standards of treatment that were expected for 2002 and thereafter. Laurelville also determined that if it could improve performance to the actual capabilities of their land area and infrastructure, the community may have an opportunity to treat municipal waste from an adjoining community and thus also lower overall per capita costs for Laurelville residents.

Laurelville was impressed with the performance history of the AquaMats® Process and its predicted capability to provide solid year round performance, even with cold climate conditions, and to substantially reduce the high cost associated with periodic sludge disposal. **Briefly, the AquaMats® Process provides the quality treatment of mechanical plants in lagoons at significant savings in capital and operating costs.** The AquaMats® Process combines ADS's proprietary diffusion aeration products, engineered surface area ("AquaMats®") and bioaugmentation ("Bacta-Pur®") technologies to form a very stable, and low-maintenance integrated system for natural microbial treatment of municipal wastewater. Operational costs are typically very low. Because of the efficiency of the AquaMats® Process, sludge handling is typically not necessary for up to 10 years or longer. Laurelville considered a number of different proposals and selected the AquaMats® Process from Meridian because it offered the most impressive performance at low capital and O & M costs, all supported by a 5-year performance guarantee.

DESCRIPTION OF AQUAMATS® PROCESS UPGRADE:

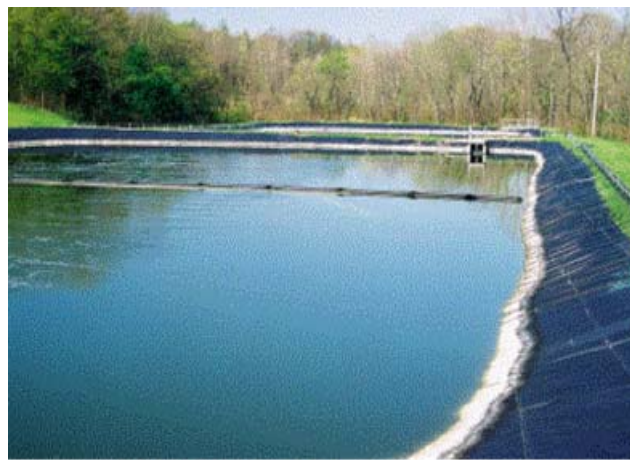
The basic goal of the AquaMats® Process for Laurelville was to convert and upgrade the existing facilities to a high performance lagoon system so that discharge requirements were consistently achieved with a comfortable margin. This included replacement of the diffusion aeration system for both primary lagoons. The existing 10 HP blowers were found acceptable and were retained to operate with one running and one standby in normal operations.

Above ground header pipe and high efficiency diffusion aeration tubing were laid across the width of all primary and secondary lagoons at a maximum of 10 foot centers. Baffles were in each primary and secondary lagoons. The primary lagoons were also equipped with Bacta-Pur® Bactivators™ to continuously supply a metered and activated quantity of XLG, a Bacta-Pur® sludge digesting product.

DESCRIPTION OF AQUAMATS® PROCESS SITE DATA:

We are very committed to providing unbiased, objective evidence that the process is efficient, cost-effective and reliable. As evidence of this, we work regularly with our customers to gather as much data as we can about their system on a regular basis. **IMPORTANT:** None of the data is gathered by us directly, it is all provided to us by our customers and then presented here for your review.

Case Study Snapshots Laurelville, Ohio



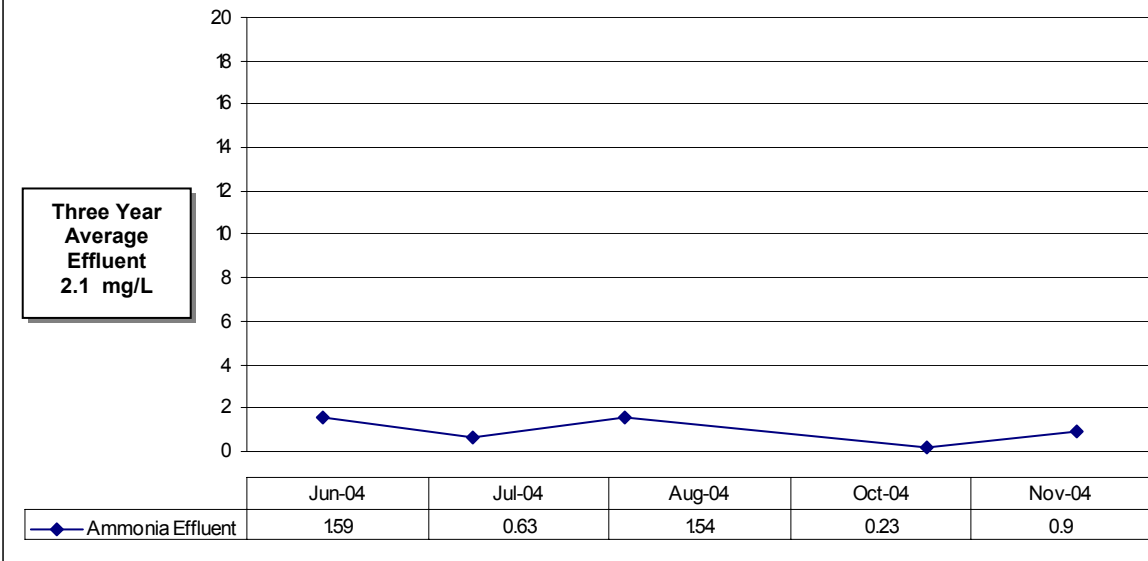
AquaMats® Process lagoons showing header pipe, diffusion tubing, and baffles.



AquaMats® in polishing cell with later view of surface biofilm and invertebrate colonization on an AquaMat after 6 weeks in wastewater lagoon. When combined with ADS fine bubble diffusion and BactaPur's formulations, AquaMats® support the animal (as opposed to the plant or algal) side of the biological food chain and convert vast quantities of organic waste into aquatic animal life!



**Laurelville, Ohio WWTP
Effluent Ammonia (mg/L)**



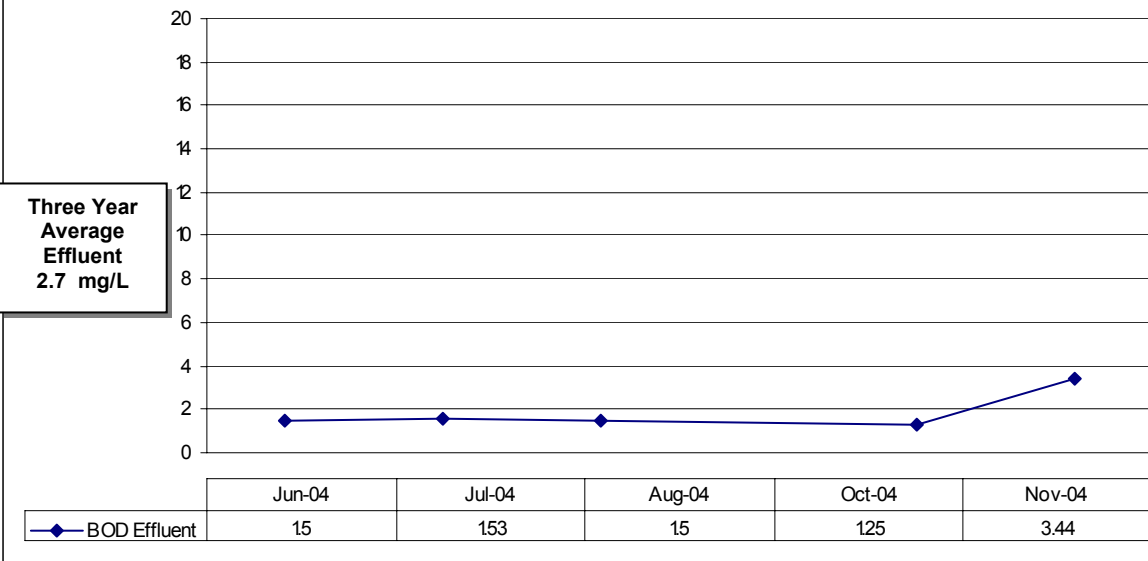
LAURELVILLE, OHIO AMMONIA EFFLUENT DATA TABLE

Year	J	F	M	A	M	J	J	A	S	O	N	D
2001 Ammonia Effluent								0.2		0.4	0.3	0.0
2002 Ammonia Effluent	0.1	0.0	3.0	2.9	1.2	0.9	1.3	0.9	2.2	3.9	0.9	4.6
2003 Ammonia Effluent	5.1	5.5	6.7	3.8	2.3	0.3	0.2	0.1	0.0	0.0	0.0	1.5
2004 Ammonia Effluent	5.2	5.5	3.0	6.3	1.5	1.6	0.6	1.5		0.2	0.9	

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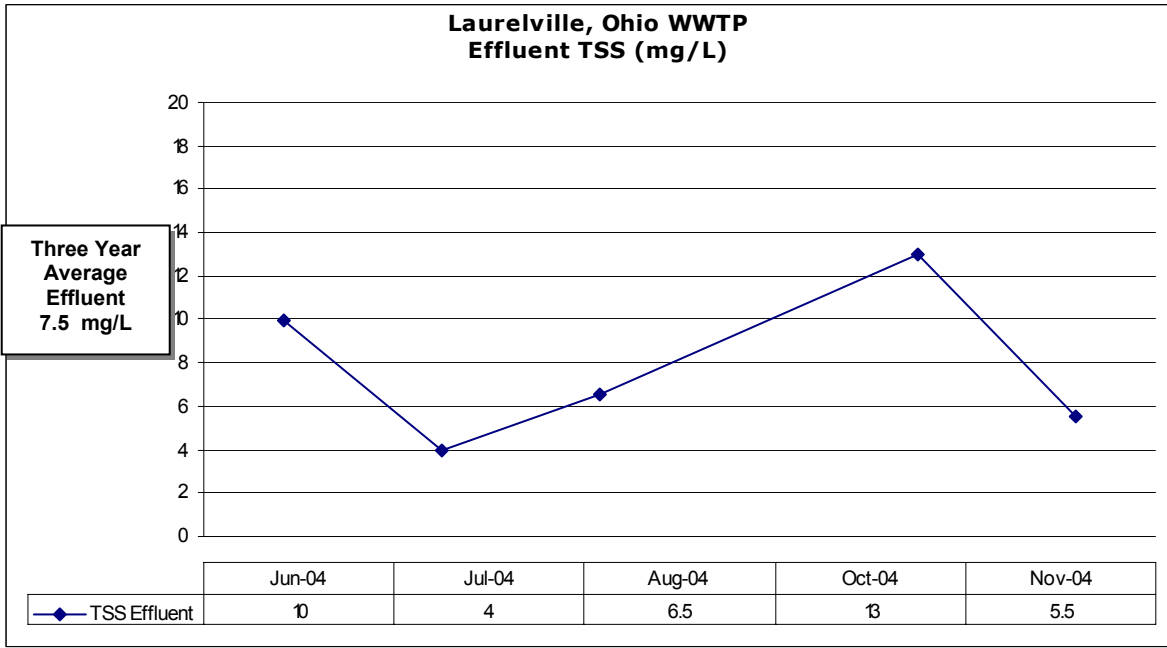
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**Laurelville, Ohio WWTP
Effluent BOD (mg/L)**



LAURELVILLE, OHIO BOD EFFLUENT DATA TABLE

Year	J	F	M	A	M	J	J	A	S	O	N	D
2001 BOD Effluent								3.2		4.3	3.2	2.3
2002 BOD Effluent	4.7	7.0	6.2	3.9	3.0	0.6	1.0	1.0	1.4	1.2	1.0	2.1
2003 BOD Effluent	3.7	4.3	5.7	2.1	1.3	1.2	1.2	1.4	2.5	2.6	2.1	2.6
2004 BOD Effluent	4.1	6.9	3.1	3.3	2.6	1.5	1.5	1.5		1.3	3.4	



LAURELVILLE, OHIO TSS EFFLUENT DATA TABLE												
2001	J	F	M	A	M	J	J	A	S	O	N	D
2001 TSS Effluent								3.2		4.3	3.2	2.3
2002	J	F	M	A	M	J	J	A	S	O	N	D
2002 TSS Effluent	4.7	7.0	6.2	3.9	3.0	0.6	1.0	1.0	1.4	1.2	1.0	2.1
2003	J	F	M	A	M	J	J	A	S	O	N	D
2003 TSS Effluent	3.7	4.3	5.7	2.1	1.3	1.2	1.2	1.4	2.5	2.6	2.1	2.6
2004	J	F	M	A	M	J	J	A	S	O	N	D
2004 TSS Effluent	4.1	6.9	3.1	3.3	2.6	1.5	1.5	1.5		1.3	3.4	

AQUAMATS® PROCESS COSTS---CAPITAL, OPERATING AND MAINTENANCE:

Capital costs incurred by Laurelville for the AquaMats® Process upgrade were under \$350,000.

Operating and Maintenance costs for AquaMats® Process have compared favorably with estimates. Of particular note, is that the upgrade did not increase the brake horsepower and system CFM requirements, which have essentially remained unchanged at Laurelville since the system commenced initial operations in 1980. Average electrical costs per capita are approximately \$4.06/per person/year or about 1 cent/person/day.

INTERNET LINKS:

Meridian Aquatic Technology for High Performance AquaMats® Technology - <http://www.aquamats.com/Biofiltration/biofiltration.html>

Air Diffusion Systems, A John Hinde Co.: Lead supplier of aeration engineering and technology products and services - <http://www.airdiffusion.com/>

IET Aquaresearch for Bacta-Pur® and Bactivator™ Bioaugmentation Products - <http://www.bactapur.com/>

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