

AMERICAN PROTEINS, INC. WINS ALABAMA WATER ENVIRONMENT  
ASSOCIATION'S 2008 EXCELLENCE IN INDUSTRIAL WASTEWATER  
TREATMENT AWARD.  
CATEGORY 4-BIOLOGICAL (ADVANCED TREATMENT)

For those of you that may not be familiar with American Proteins, the division in Hanceville is the largest poultry products recycling (rendering) facility in the world. They recycle inedible poultry products into usable protein and fat. There are two plants at the Hanceville site, one is dedicated to the production of pet food-grade poultry meals and fat and a second that produces feed-grade poultry meal, hydrolyzed feather meal and fat for the animal kingdom. American Proteins has been successfully reclaiming an otherwise waste product to provide food for the animal kingdom.

The wastewater treatment facility at American Proteins, Inc. consists of various collection systems, a pretreatment facility, an anaerobic lagoon with biogas collection and utilization in boiler operation, two aerobic lagoons, four stage activated sludge system, tertiary filtration and ultra-violet disinfection. The high quality water produced by American Proteins is either recycled as make up water in their reuse lagoon and cooling lagoon or discharge into the Mulberry Fork of the Warrior River. For the operation purposes the treatment facility is divided into two process areas: pretreatment or physical treatment and biological treatment.

The pretreatment processes include a surge wet well, a Hycor fine mesh drum screen, two dissolved air flotation (DAF) units and a flow equalization basin (FEB). These physical treatment processes start after the flow is collected in the wet well. From the wet well the flow is pumped to the Hycor screen where the separated solids are collected and conveyed to a trailer to recover the proteins and fats. The water passing the Hycor flows by gravity to the #1 DAF where the floating solids (mainly fats) are captured and pumped to a tanker for recycling; the settled solids are also sent back to the rendering process. The supernatant from the #1 DAF is pumped to the FEB. Water from the FEB is pumped through a flocculation tube where a three part polymer program is employed using a polyamine, cationic and anionic polymers. The flow is mixed prior to entering the #2 DAF. The floatables or top skimming (more proteins and fats) are collected and pumped to a tanker to be for recovery of proteins and fat. The high strength wastewater from #2 DAF is pumped to the anaerobic lagoon to begin the biological process.

In addition to the DAF flow, the covered anaerobic lagoon receives plant condensate that does not require pretreatment because of its low solids content. Effluent from the large anaerobic lagoon can be directed to either the aerobic lagoon or in the activated sludge process. In 1966 when the waste treatment facility was first built American Proteins had only the anaerobic and aerobic lagoons. Now particularly in the summer the aerobic lagoons are used to not only provide biological treatment and odor reduction but they also reduce the temperature of the waste before it enters the activated sludge system. In the cooler winter weather, the effluent from the covered anaerobic lagoon is fed directly to Reactor #1 of the activated sludge process.

The activated sludge process consists of four reactor basins. Reactor #1 is operated as an anoxic zone to denitrify the waste stream. Reactor #2 uses a jet aeration system to maintain oxic conditions for BOD reduction and nitrification. Over 700% of the influent flow is recycled back to Reactor #1 to achieve denitrification while the remainder of the Reactor #2 effluent flows to Reactor #3. Reactor #3 is a second anoxic reactor for additional denitrification. The effluent from Reactor #3 flows into Reactor #4. Reactor #4 is a second oxic reactor. The effluent from

Reactor #4 flows to the final clarifier. All the return activated sludge goes to Reactor #1. The waste activated sludge is pumped to a waste holding lagoon and is land applied on an annual base. The clarifier effluent flows by gravity to a tertiary filtration a disk filter and then to the ultra-violet disinfection prior being released through a submerged diffuser for dispersion in the river. The average discharge to the Mulberry Fork during the year was about 400,000 gallons per day.

Part of the wastewater treatment plant effluent is recycled back to a “fresh water” pond at the rendering plant. The fresh water pond provides cooling water for the rendering plant condensers to collapse vapors from the cooking process into condensate water. The cooling system recirculates up to 20 million gallons per day.

From the staff’s operating experience and facility modification the wastewater treatment plant recycles up to 6.0 million gallons per day of high quality effluent for use at the rendering plant, which has drastically reduced the need for potable water. The current influent flow to the wastewater treatment system averages between 0.8 to 1.0 mgd.

All solids (protein) and fats generated by pretreatment have a value and are processed through the factory and blended with the other meals and fat. The economic benefits of these improvements are impressive and amounts to over 400,000 pounds per week and over a 12-month period has a value of over \$500,000 with a cost avoidance of waste disposal costs of about \$350,000.

Between 1996 and 2008, American Proteins made numerous additions and modifications to the wastewater treatment system to improve effluent quality, mitigate operating problems, reduce odors, and cut costs. An indicated of how effective the staff of ten (10) operators is this facility controls this treatment process is the reduction of ammonia across the plant. The effluent from the anaerobic lagoon has an average ammonia concentration in excess of 2,500 mg/L while the ammonia in the final effluent released to the Mulberry Fork has averages less than 0.5 mg/L.

In addition to the physical plant modifications management and operation personnel have implemented an Environmental Management System (EMC) and made numerous safety improvements at the plant and implemented a comprehensive safety program over the past several years.

The management and operations team at American Proteins takes permit compliance very seriously but have gone beyond simple operating the system to meet permit limits, they have taken the next step to improve the bottom-line economic performance of the rendering and waste treatment plants. Tommy Bagwell is the chairman of the board/CEO for American Proteins. He has been very community involved with the environmental area and serves a steward of the environment. You can see American Proteins caught our attention and is very deserving of AWEA’S 2008 EXCELLENCE IN INDUSTRIAL WASTEWATER TREATMENT AWARD. CATEGORY 4-BIOLOGICAL (ADVANCED TREATMENT).