

WASTE WATER TREATMENT PLANT CASE STUDY

PROJECT

Briarcliff & Franklin Furnace Waste Water Treatment Facilities,
Scioto County, Ohio.

Plant Supervisor: Wayne Mills (614) 574-2045
Plant Operator: Ray Reynolds (614) 574-2045

PROBLEMS REPORTED (Prior to MHD Installation)

FLOCCULATION:

- * Solid material was not settling.
- * 80-90% of the surface area of the flocculation beds was covered with solid matter.
- * Sludge pump could only operate for approximately 60 seconds before clear water would start coming out.
- * Chemical flocculants were added daily.

BOD:

- * Biological Oxygen Demand was running in the mid triple digits.

pH:

- * pH was running high alkaline (9-11 pH).
- * Hydrochloric acid had to be added daily.

RBC:

- * Rotating Biological Contactors were operating inconsistently and were just spotted with bacterial activity.

STATIC SCREEN:

- * The static screen constantly became clogged with hard deposits.
- * Every 2 days, the plant was shut down in order to clean the static screen with a strong solvent.

SOLUTION

INSTALLATION OF THE MAGNETIZER MHD SYSTEM

RESULTS

FLOCCULATION:

- * Solid matter was settling and the surface water was virtually absent of any floating solids.
- * Sludge pump would run about 1 hour, efficiently pumping sludge (approximately 3,000% increase in efficiency.)
- * Chemical flocculants were totally eliminated.

BOD:

- * Biological Oxygen Demand stabilized in the lower double digits.

pH:

- * pH levels were brought within EPA tolerances throughout the waste water system.
- * pH was stabilized to 7.04 in the final clarifier.
- * Hydrochloric acid was totally eliminated.

RBC:

- * Within 30 days, the Rotating Biological Contactors had increased bacterial activity with uniform coverage.

STATIC SCREEN:

- * Free of hard deposits.
- * Plant shutdown and solvent cleaning was eliminated.
- * Became more effective in collecting debris.

SUMMARY

The installation of the Magnetizer MHD System brought the waste water facility into EPA compliance and the system operated more efficiently. The Magnetizer System caused solids to settle more within the requirements of most waste water equipment while increasing bacterial activity.

pH levels were brought within EPA tolerances throughout the facility, while eliminating expensive chemicals.

WASTE WATER TREATMENT:
Implementation of MAGNETIZER Technology to
Increase System's Efficiency

1. **BARSCREEN:** After waste water enters the plant, it is treated with chlorine to control odors. The waste water then passes through the barscreen. At the barscreen floating debris is skimmed and then ground up and returned to the waste water treatment process. Previous methods for the cleaning of the barscreen usually utilized solvents, such as kerosene. Needless to say, this cleaning technique is environmentally unsound.

The mounting of a MAGNETIZER unit on this pipe, prior to the fluids induction to the barscreen's tank, helps keep the barscreen clean by freeing hard deposits from the surface. It should be noted that waste water treatment facilities had to clean the static screen several times per week prior to the installation of the MAGNETIZER unit. After installation, no further cleaning was needed.

2. **PRE-AERATION:** A MAGNETIZER is installed to diminish BOD to enhance and accelerate biological activity.

3. **PRIMARY SEDIMENTATION STAGE:** During this stage of treatment waste water enters the sedimentation tanks where floatable material is skimmed and heavier materials (sludge) settle to the bottom of the tank. Mounting a MAGNETIZER unit on the inlet side of the sedimentation tank aids in the settling of the sludge. The magnetized water, with its decreased surface tension, permits the particulate matter to settle quicker. This is manifested as an increase in pump duration time, i.e., the pump will pump sludge for a longer duration before pumping clear water. Reduced surface tension of the fluid not only increases settling but also decreases fluid resistance thereby increasing the pump's efficiency. The initial test increased sludge pumping from 60 seconds to 1 hour before mechanical agitation had to be employed, which is a very significant increase in efficiency.

4. **WASTE HEAT BOILER:** A MAGNETIZER is installed at this location for fuel energization for higher energy output through efficient combustion.

5. PRIMARY EFFLUENT DISCHARGE LINE: The mounting of a MAGNETIZER unit on the pump's discharge line accelerates the biological activity, since the bacteria used in waste water treatment are aerobic in nature. Chemical flocculents are long chain polymers that possess a net positive charge. The net positive charge (+) allows the fluid containing these chemicals to attract (-) oxygen. When waste water, at this stage, is treated with the proper magnetic field an accelerated (+) charge is induced in the fluid. When the fluid is pumped to the secondary aeration stage, this accelerated (+) charge picks up additional oxygen, thus increasing bacterial growth and the breakdown of the nutrient material.

6. & 7. SECONDARY CLARIFIER: MAGNETIZER unit stimulates biological activity in the clarifier. Also, the return line is energized to stimulate biological activity in the secondary aerator.

8. SPRAY HEADS OF SECONDARY CLARIFIER: MAGNETIZERS mounted on the rotating arms of the secondary clarifier keep spray head free from clogging deposits. Also, increased solubility reduces odors.

IN SUMMARY: Positive charges, magnetically induced into waste water treatment systems, create the flocculation of material that previously weren't responsive to chemical flocculation. This stabilizes Ph without acid or alkaline additives, and increases oxygen for aerobic bacteria thereby severely decreasing Biological Oxygen Demand. MAGNETIZER has produced new areas of efficiency thereby greatly reducing further maintenance, chemical, and equipment needs in waste water treatment.

P R E S S R E L E A S E

MAGNETIZER UNITS USED TO ACCELERATE
WASTE WATER TREATMENT

In 1989, two waste water treatment facilities in Scioto County, Ohio, Briarcliff and Franklin Furnace, were experiencing flocculation problems. Solid materials were not settling and 80% to 90% of the surface area of the flocculation beds were covered with solid matter. It was necessary to add chemical flocculants daily. As a result of the poor settlement, the system's sludge pump could only operate for 60 seconds before liquid would start coming out, and the biological oxygen demand, BOD, was running in the mid triple digits. To drop the pH of the system from the 11 range, hydrochloric acid had to be added daily. Rotating biological contractors were operating inconsistently, and every 2 days the plant was shut down in order to clean the static screen with a strong solvent.

In order to solve these problems, magnetic treatment units, (patent #4,605,498) manufactured by the MAGNETIZER Group, Inc. of Gardenville, Pennsylvania, were installed at various select locations throughout the system.

Within days, solid matter was settling and the surface water was virtually absent of any floating solids, due to the increased flocculation caused by the magnetic devices. Now, the sludge pump would run about 1 hour before pumping liquid. This was an increase in efficiency of approximately 3000%. Chemical flocculants were totally eliminated and biological oxygen demand stabilized in the lower double digits. With the pH levels brought into EPA tolerances throughout the entire waste water system (pH in the final clarifier stabilized at 7.04), the addition of hydrochloric acid was totally eliminated. The static screen was now free of hard deposits, thus eliminating the need for cleansing with harsh solvents.

The MAGNETIZER system caused solids to settle within the requirements of waste water treatment equipment while increasing bacterial activity. The pH levels were brought within EPA tolerances throughout the facility while eliminating the expensive chemicals.

In summary, the installation of the MAGNETIZER system saved a tremendous amount of normal maintenance time and money, created operating efficiencies which heretofore had never been experienced, and brought the facility into EPA compliance for very little cost. Ray Reynolds, Plant Supervisor, conducted the tests and indicated that MAGNETIZER has created a whole new way of looking at operating efficiencies and may be the heaviest technical breakthrough in waste water treatment to ever happen. For more information contact:

The MAGNETIZER Group, Inc.
Gardenville, Pennsylvania