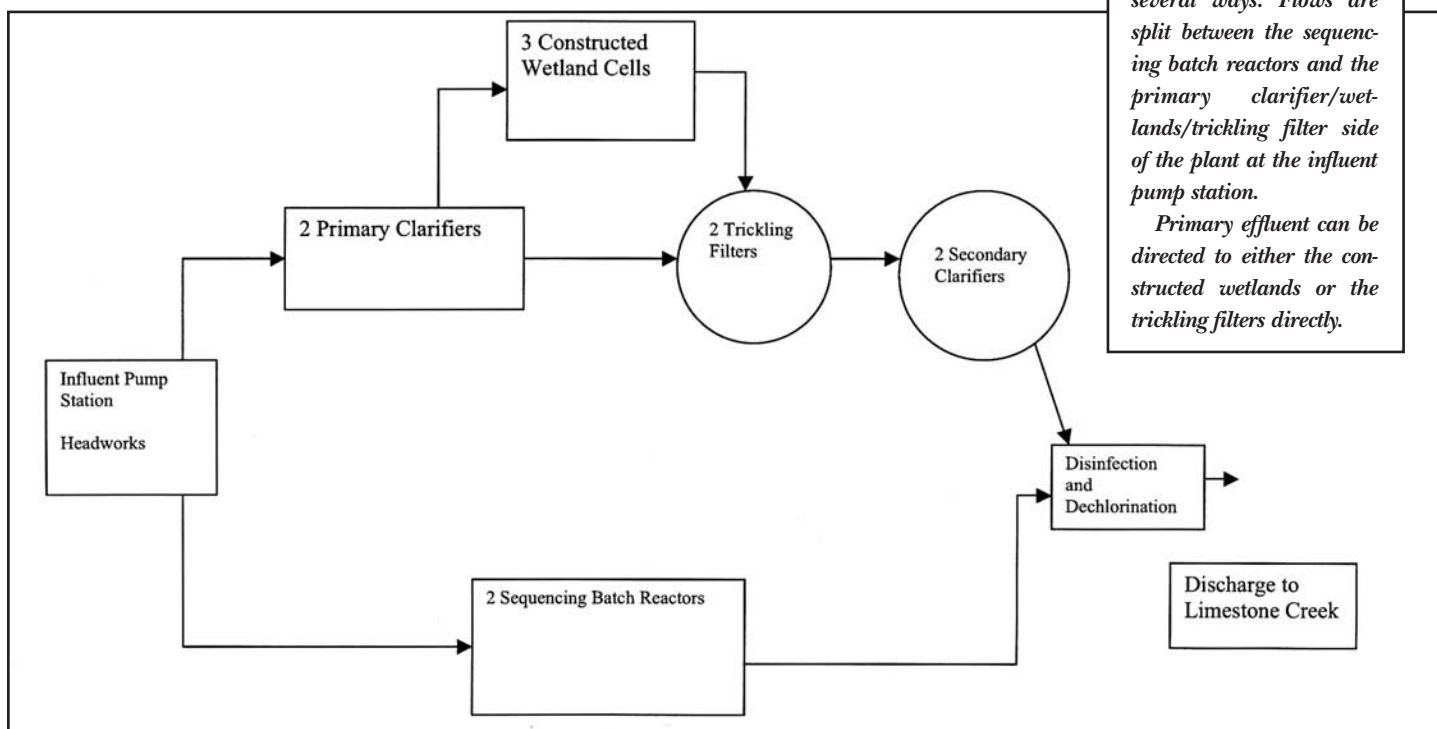


# Budgeting for Operation and Maintenance at a Small Plant: Village of Minoa Case Study

by Steven Giarrusso



Process schematic: Village of Minoa wastewater treatment plant

The Village of Minoa has its own wastewater treatment facility serving a population of approximately 3,345 residents.

At first glance the Minoa facility could simply be considered a small plant; however, it is in reality a very unique facility composed of three totally different kinds of reactors. The collection system consists of 28.5 miles of sewer and one main pump station. No industry is present in the village. In 1997 the village completed its construction upgrade of the plant. The project, spread out over several years, included installation of plastic media in the original trickling filters, construction of sequencing batch reactors (SBRs), and installation of three constructed wetlands. Since a large section of the collection system is built below groundwater levels, the wetlands were originally built to handle wet weather flows. Since the upgrade was completed, the operators have found that the wetlands are tremendously efficient at removing pollutants. Each of these reactors has its own personality and temperament. For this reason, the operators have to be skilled in all aspects of the Minoa facility and its diversities. Research is currently being conducted to better understand the workings of these reactors, enabling

researchers to maximize their performance. Logistically, the plant's permitted flow is 0.55 million gallons per day (mgd) for dry weather flow and 0.9 mgd for wet weather flow.

The Village of Minoa's wastewater plant is staffed by two certified 3A operators—Steve Giarrusso and Pat Meehan. Unlike large facilities that have multiple departments to handle different plant functions, a small-plant operator has to be a multitasker who must take responsibility for all operations. In Minoa this includes being skilled in maintenance, budgeting, lab work, public relations, and problem solving for both the collection system and the wastewater treatment plant. Whether a large or small facility, each plant faces the same daily challenges and goals of sustaining a well-run plant and a quality effluent. Large plants have many departments that delegate tasks to its employees. A small-plant operator has to learn to budget his time to be able to meet the needs of the facility. In Minoa the operators are well versed in their mission when facing maintenance or reactor problems: adapt, overcome, and improvise. The operators are cross-trained in order to maximize efficiency in the event that one operator is unable to attend work on any given occasion.

Budgeting time is one of the most important objectives for Minoa's plant operators. Simplification is the key, considering the number of events that take place each day. Keeping the plant operational takes planning, budgeting, and preventative maintenance. One of the key methods used in accomplishing this was to educate the village's board member in charge of overseeing the plant in the complexity of the plant, which led to further involving them in budgets and maintenance. The operators attend village board meetings and keep the board and the mayor informed about current and upcoming projects.

Today, operational costs are a main focus. An example of the benefit of getting the village board to work with us was when we needed to purchase a one-meter belt press from the Al Rick Press Company. The operators explained to the board that the drying beds had become inefficient because of the increased amount of biosolids from the SBR and that trucking liquid biosolids was very expensive. With the purchase of the new belt press, the operators showed a projected savings and a time schedule for when these savings would actually pay for the machine. To our amazement, in just one year the press saved more than projected, and it was paid

for in less than three years. Other budgeting requires the operators to plan for the replacement of old motors with new, more energy efficient ones and to explain to the board why operation shutdowns are needed to prevent major breakdowns. Preventing breakdowns before they happen is one of the primary maintenance goals of Minoa's wastewater treatment facility. Planning is done many months in advance so that the village and its wastewater treatment plant operators can create a budget that encompasses all of its goals.

Not only are the operators at Minoa responsible for the plant's planning and budgeting, but they are also responsible for planning and budgeting the village's infrastructure. The operators at Minoa over the years have compiled detailed information on the village's collection system. Some of the information includes pipe sizes, distances between manholes, types of pipes, year installed, year upgraded, force mains, possible problem spots, maps, and more. This information can be found on both the plant computer and the village's office computer. When contractors and engineers have a question on any part or section of the infrastructure, the answers are readily avail-

able. Every year the operators pick a problem spot and budget for its repair or replacement. This year a manhole was replaced in an area that tends to flood. By making this replacement we are averting a major problem or a potentially disastrous situation.

Due to the fluctuations in temperature throughout the year, the planning for maintenance of the facility is strategic. All major projects are planned to take place in the spring and end by the fall. During the winter months, preparations for the following year's projects begin, and computer updates are completed. To make the operator's job easier, all equipment information is entered into the computer. Each piece of equipment has its own data sheet that lists things such as the make, model, service representative, and date of installation. From the information contained in the operations and maintenance manuals, a brief maintenance schedule was created, including when to grease the machinery and the types of grease to use, when to change the oil and the types of oil to use, when to change the filters and the types of filters to use, and more. With this information in the computer, the operator only has to look at the data sheet for any piece of equipment for a quick and simple

reference. Small-plant operators have limited time, and the computer in Minoa has become an important, timesaving tool.

The operators also wrote another program to track weekly and monthly maintenance. Using the operations and maintenance data that had been gathered for the first program, the operators made some decisions, and a maintenance program that was specific to the Minoa facility was derived.

When any maintenance is done at the facility, a log of what was done and who performed the job is entered into the computer. Every month a new log is started. This log is priceless when the Department of Environmental Conservation visits the facility to conduct its yearly inspections. At the end of the month, these daily entries come together in a very comprehensive log that is simple to use as a reference.

In Minoa, keeping ahead, being proactive, and educating and involving the village board are the keys to what makes this facility run with the excellence that is expected.

*Steven Giarrusso is a research biologist and the chief operator at the Village of Minoa wastewater treatment facility.*

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