

Wastewater Treatment in Al-Bireh (Palestine under War Conditions)

Automatic Operation During Curfew

Operating wastewater facilities of the city of Al-Bireh (Palestine) during the last military occupation where curfew was imposed on the whole city, was one of the greatest challenges faced by the engineers and technical staff of the Municipality. After the first five days of the military occupations where the population had been forced to stay in house, the curfew was lifted for only four hours. Every body was then running to provide for food and other necessary needs of a life under curfew. It was impossible to reach the wastewater treatment plant, which is located nearby an Israeli settlement. Even the guard who has been guarding the plant left the site back home.

No analysis could be made, no monitoring, no scumming and no sludge dewatering. The wastewater treatment plant was running automatically on its own, the only thing that I was sure of is that the power supply was continued during these first five days and the machines were running properly with no stop.

Short Control After Nine Days

After nine days of the curfew was lifted again for four hours and one of the best operators of the plant could reach the site and start pumping the stabilized sludge from the thickener by using mobile pumps with no dewatering, since the time available was really short to remove a big hip of dried grass and soil that has accumulated weeks before, few meters out of the wastewater treatment plant boundaries. It was arranged to continue the pumping until half of the gravity thickener was emptied.

Excess sludge pumping to the thickener was also increased and a quick cleaning of the pre-treatment unit could be made. Nothing else in such a very short time could be arranged.

After 18 days we could reach the plant again and this time we were three people: sewage engineer, chief operator and one operator. We made a very quick visual inspection of the plant. It was a big mess : a high quantity of scum floating in the clarifiers, the head works were really dirty. The visual inspection of the machines and the online sensors gave an indication that the process should be still efficient. The power supply continued with no interruption, the diesel tank was full and the stand-by generator was in excellent condition.

A discussion of what could be made was shortly made on site. We thought that the dry-solid content of the aeration tank should be very high and thus the sludge age should be also high. The most urgent thing was getting rid of the stabilized sludge from the thickener in order to normalize the values of the dry-solid content of the return sludge and the sludge at the aeration tank.

Since no more sludge pumping by the mobile pumps could be pumped on the hip of mixed soil and dry plants, we had the feeling that we had to do something in order to save the process and the plant.

Dramatic Gradual Measure

Nobody in the region could be consulted since there is nobody having experience in the operation of wastewater treatment plants other than us. We are good trained to run the plant by high qualified personnel of the university of Bochum, Technical University of Braunschweig, Erftverband, ATV-DVWK, and GTZ staff that left the country due to the war conditions, but we are very new to the experience of the operation in war conditions.

We decide to start what we called "dramatic gradual measures" in order to save the process and the plant. The first step of the dramatic measures was to lead a very small quantity of raw wastewater to the by-pass. We calibrated the sluice gate at the headwork in order not to have more than 25 liters per second of influent flowing to the by-pass with no biological treatment. Only the removal of solids and sand by mechanical treatment could be achieved for this small bypassed quantity of wastewater. At that point we did not know how long the military occupation would last and for how long we would not be able to reach the plant, but for sure we did not know at that moment what would be the second step of our gradual dramatic measures.

Back to normal operation

Three days after our last visit to the plant the curfew was lifted and this time permanently. We could reach the plant again on a regular basis. We started immediately intensive laboratory analysis of BOD, COD, suspended solids, total nitrogen, of influent and effluent. MLSS for excess sludge and the aeration tank were also made in addition to different other analysis. The operators started intensive machines checking and maintenance. Oiling greasing and cleaning was carried out for the necessary machines and parts of the plant. The staff at the plant was reinforced by additional non-skilled staff to assist in cleaning and grass cutting which is still ongoing till today. The result of COD analysis (904mg/l influent and 87 mg/l effluent) showed that the process was still efficient. The rest of the result of the other analysis showed that the biology was excellent. Only the MLSS at the aeration tank (5.2 g/l) and for the excess sludge (8.1 g/l) was high. Therefore an intensive dewatering of the sludge was carried, what we thought was appropriate measure and as was recommended by our expert friends at GTZ, as soon as they could be in telephone contact with us.

Today and looking to the result of the analysis we could be more relaxed since the wastewater treatment plant of Al Bireh which is still the only wastewater treatment plant that is still working: the plant was constructed in a joint effort between us and our German friends two years ago, and the environment shared between Palestinians and Israelis could be protected, even though we were forced to stay under curfew for three weeks. Under very critical safety conditions we made our best to save the environment.

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