

Case Study: Lake Rehabilitation Baku, Azerbaijan

Aquaread exclusive distributor in the Netherlands, Eijkelkamp Soil & Water, has been involved in a major project installing Aquaread equipment in Baku, Azerbaijan.

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Baku was the location for the first ever European Games in June 2015. The stadium, overlooking Lake Boyuk Shor, brought attention to this heavily polluted waterbody, so the Ministry of Economics and Industry in Azerbaijan instigated a clean up operation.

Eijkelkamp Soil & Water supplied and installed the equipment that will monitor the water quality and water quantity in Lake Boyuk Shor now the European Games are over. Lake Boyuk Shor is the second largest lake in Azerbaijan, but it is heavily polluted.



Background

The major remediation project is being implemented by Dutch engineering consultants, Witteveen+Bos. They are working on landscape improvement and water quality remediation of nine lakes around Baku, including Lake Boyuk Shor. Each of the nine contaminated lakes must be cleaned by 2030.

The rehabilitation of Lake Boyuk Shor is split into two stages. The first stage is now complete, and included the separation of the most polluted part from the rest of the lake using a dam. The second stage will take the longest time as it is focused on the reconstruction of the lake's ecosystem and aims to return the lake to its natural historic state.

The second stage will be implemented from 2015-2020. The work done so far has already improved the water quality in the lake. Lake Boyuk Shor is rated by international specialists as one of the most complexly polluted lakes in the world, so there is a lot of remediation work still to be done.

One of the Most Complexly Polluted Lakes in the World

Oil is a major natural resource in Azerbaijan; it is drilled on both land and sea. Historically, this resulted in serious pollution in and around the lakes of Baku. The pollution issue was compounded by other industrial waste, untreated sewage and general waste ending up in and around the lakes. The condition of the lakes poses a threat to the health of local people and creates conditions favourable to the emergence of different diseases.

The main pollutants in the lakes are heavy metals such as copper, cadmium, iron, zinc and manganese. There are also much higher than normal levels of:

- cation and anion concentrations;
- calcium;
- magnesium;
- chlorides;
- sulfates;
- synthetic detergents; and
- biochemical oxygen consumption.

Remediation Activity so Far

As part of the first stage of remediation work, the highly polluted bed of Lake Boyuk Shor has been dredged; over 2.8 million cubic meters of heavily oil polluted silt have been dredged, temporary storage for the contaminated dredging spoils has been created, and dams constructed to isolate the project area.



This is what Lake Boyuk Shor looked like in March 2013:



And here it is, transformed, in April 2015:

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Aquaread Water Quality Monitoring Equipment

Eijkelpomp Soil & Water installed four water quality stations with floats to keep the probes at a set depth. The monitoring stations monitor water quality using the Aquaread AP-7000 probe. The probe comes as standard with sensors that measure optical dissolved oxygen, pH, ORP, conductivity, resistivity, salinity, TDS, SSG, and temperature. Eijkelpomp Soil & Water then added additional parameters into the user configurable sensor ports: refined oil, chlorophyll and turbidity.



A water quality station in situ at Lake Boyuk Shor:



Setting up the water quality station:

The AP-7000 used with the Blackbox, as used in this application, provides an independent monitoring station capable of self cleaning allowing users to remotely collect accurate data for longer. The AP-7000 is specifically designed for long term deployment, as in this application where fouling of the sensors can be an issue.

Aquaread is an award-winning British manufacturer of precise, scientific water quality testing equipment. Our specialism is multiparameter water testing equipment and highly precise water level and temperature loggers. All Aquaread equipment is designed to be used in the field and is constructed from rugged materials that can withstand harsh conditions and all types of water.

Eijkelpomp Soil & Water makes a difference worldwide by developing, producing and delivering solutions for soil and water research. Eijkelpomp Soil & Water is involved in soil and water projects worldwide within the themes Land Degradation, Food Safety, Urbanisation, Pollution, Land Development and Natural Resources. Eijkelpomp Soil & Water is represented in over 70 countries by specially selected partners.