

Hanoi Water Treatment through REDOXY-3C

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June 30, 2017

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1 Introduction

Hanoi is a city between rivers built from low level land, Hanoi has many scenic Lakes and is called City of Lakes among its lakes, the most famous are Hoan Kiem Lake, West Lake and Bay Man Lake and are historical and cultural center of Hanoi. West Lake is very popular place for local people and tourist to spend time. It is the largest lake in Hanoi and there are many temples around the area, but things have changed because of Human impact on lakes, rivers and Lagoons. Lakes are under threat from human activities such as pollution and over fishing. They are also threatened by sewage, coasted settlement, drainage and filling of wetlands. Entrophication due to excessive nutrients from sewage and animal wastes, pollution including heavy metals, polychlorinated biphenyls, radionuclides and hydrocarbons from sewage inputs. Months back tones of dead fish washed up in Hanois Largest Fresh WaterLake, prompting the citys mayor to call it an unprecedented mass fish death, raising questions about water pollution in the Vietnamese Capital.

2 Related Work

2.1 Rescue Hanoi Lake with REDOXY-3C preparation

5.4 tons of REDOXY-3C preparation used to clean the lake made by Watch Water Germany ordered by Hanoi People's Committee, was sprayed on West Lake to treat pollution after fish died abnormally. Good results have been reported after using REDOXY-3C in many polluted lakes in Hanoi, the city continues to replicate this model to other ponds and lakes in the city.[2,]



Figure 1: Experts are processing Hoang Cau Lake water with REDOXY-3C

In late July and early August, many polluted lakes in Hanoi were piloted using REDOXY-3C to clean the lake water. After successful testing in 3 lakes: Giap Bat, Bo Moi, Ba Mau, Chairman of Ha Noi People's Committee directed to continue using this product to treat lakes in the National Monument. And replicate the pollution of ponds and lakes in the city. Prior to treatment, the water of Dong Da Lake, West Lake, Hoan Kiem Lake, Giang Vo are mildly organic pollutants, some indicators higher than permitted standards for surface water. Particularly in Dong Da lake, in addition to organic pollution, ammonium and phosphate are also contaminated. According to Associate Prof. Dr. Le Thu Ha, lecturer in the Department of Biology, University of Science, Water pollution in Hanoi, after 5 days using REDOXY-3C, Sensual water in the lake, no smell. Aquatic creatures grow normally. Surface water parameters of the lakes have returned to acceptable levels, ammonium and phosphate levels decrease over time.

2.2 Close view of Hanoi water lake using REDOXY-3C technology

After experimenting to treat water pollution with REDOXY-3C technology of Germany in the reservoirs: Pit, Ba Mau, Giap Bat and obtained remarkable results. Hanoi Drainage OneMember Limited Liability Company continues to apply this technology to clean Hoang Cau Lake.[11, 2016]

2.3 Treatment of unusual dead of fish in West Lake

Unusual death of fish in the West Lake in early October has made the public care very anxious. Immediately after receiving information that many fish in West lake dead washed ashore fishy odor, 210 pm, Chairman of Hanoi People's Committee and Vice-chairman came to the scene of the inspection, direct the handling. In the face of complexity, The city has set up an incident management committee and promptly implemented 7 urgent measures People are advised not to use dead fish for unknown reasons to ensure safety. From 210 pm to the following day, more than 1,000 people, belonging to the armed forces, police, police fire, fire and rescue, rescue, companies, units and a large number of people volunteers in the lake ward have used the means to continuously picking dead fish.



Figure 2: Preserving and preserving the environment of sustainable West Lake

URENCO URBAN MEMBER CO. (URENCO) mobilized dozens of vehicles, immediately transported dead fish was collected, put to the Nam Son Waste Treatment Complex (Soc Son district) processing ... Parallel With the salvage of dead fish, the improvement work, ensuring environmental sanitation is also particularly interested, with many synchronous measures such as: Install 40 oxygen scavenging machines on the lake and 2 large capacity jet pumps

to increase the amount of oxygen in the water Spraying, spraying 5.4 tons of REDOXY-3C water purifier (effectively tested in many lakes) to reduce pollution levels. Thanks to these synthetic measures, after only two days, the water quality in the lake has improved markedly: the amount of oxygen in water from the zero equilibrium has risen from 4.5mg / liter to 9mg / l, higher Much more than the standard is 4mg / liter.[9,]

2.4 German product rescues Hanoi polluted lakes

The Hanoi Water Drainage Company Ltd. is cleaning the lakes of Hoang Cau and Van Chuong with REDOXY-3C technology from Germany.[11, 2016]



Figure 3: This product was exclusively ordered by the Hanoi People's Committee. This is the first time an environmentally friendly modern technology was applied to lakes in Vietnam



Figure 4: Tran Trong Van, deputy general director of the Hanoi Drainage Company, said that Hanoi will use the product to clean water of other lakes in the city.

2.5 Hanoi: Expected to dredge Hoan Kiem lake at the end of July

At the press conference held by the Department of Propaganda and Training in the afternoon of 30/5, Vo Tien Hung, General Director of Hanoi Drainage Company said that Hoan Kiem lake is seriously polluted and lost. Self-cleaning ability. Lake water quality is deteriorating, the pH is always high, the suspended solids in the lake is higher than the standard allowed in all 5 monitoring sites.[VietTimes.vn, 2017b]

In addition, the lake is in a state of organic contamination with BOD, COD is almost 2 times higher than allowed standards. Lake in some locations are discolored, no longer retain the blue endemic. In addition, the pollution caused by the mud floor in the bottom of Hoan Kiem Lake is very thick, where up to more than 1m, leading to the water level only 0.5-0.8m.

It is important that during the cleaning process the green coloring of the lake water must be preserved. This unit proposes to improve Hoan Kiem Lake environment through two main solutions : dredging mud, disposing of waste at the bottom of the lake and treating and maintaining the quality of the lake water. After dredging will supplement water of Hoan Kiem Lake with well water. Next, treat the water with REDOXY-3C, aiming to improve the water quality and preserve aquatic life.

Nearly 200 polluted lakes need to be treated with special preparations. Accordingly, the inner city of Hanoi has about 119 lakes, is expected 72 lakes need to handle in the fourth quarter 2016. The total number of lakes in 17 districts and Son Tay town is about 1,510 lakes, ponds and lagoons, of which the pro-



Figure 5: The quality of Hoan Kiem Lake is seriously polluted

posed treatment of local authorities is 100 lakes. In early September, the Hanoi People's Committee has set up a team to pilot water treatment in Giap Bat, Ho Mo, Ba Mau with special preparations (Redoxy-3C) pole.[VietTimes.vn, 2017a]

2.6 Hanoi announces causes of mass fish deaths

According to Hanoi People's Committee, changeable weather had lowered the level of dissolved oxygen in the water. Large numbers of people also keep throwing waste into the lakes. Unmanageable fish farming and other businesses on the lakes are also causing pollution.[4,]

Statistics from Hanoi Center for Environmental and Natural Resources Monitoring from 2011-2016 show that the water quality at Hanoi's lakes is getting worse with Van Quan and Giap Bat lakes top the list. The concentration levels of many substances are over the permitted levels. Within this year, the city has directed the Hanoi Sewerage and Drainage Limited Company to fix the pollution situation of 58 lakes with the German REDOXY-3C.



Figure 6: About 400 kilograms of fish died in Linh Dam Lake in late October, 2016.

2.7 Hanoi testing special preparations to rescue lake pollution

To save the lake is polluted, Hanoi ordering a German company producing special preparations. Testing process brings positive results.

Redoxy-3C clean water several lakes in the city with the capital products, Hanoi Drainage Company said the testing process at the lake Giap Bat and Me, Three Forms for positive results. Lake water no unpleasant smell, the people around have positive feedback.



Figure 7: Hanoi testing REDOXY-3C: Koi lilly plant alive and heathy after REDOXY-3C treatment

2.8 Hanoi: Efforts to improve lake pollution

In an effort to improve the quality of the entire lakes of the capital, free from pollution, after the initial success in using REDOXY-3C exclusively from Germany, To date, Hanoi Drainage and Sewerage Company Limited has continued to use the above products to deal with the situation of polluted lakes in the capital.[11, 2016]

2.9 REDOXY-3C that German scientists provide for Hanoi and Cost Saving

Specifically, through the 126 samples of water sent to Germany for analysis, the German scientists put out REDOXY-3C supplies to Hanoi. Watch Water Germany conducted the experiment for 6 months. It is considered to be the most



Figure 8: Recently, functional forces have also used REDOXY-3C to treat the West Lake water after the mass death of fish

economical, cleanest. For example, for Hoan Kiem Lake, the old method was VND 6 billion. However, according to this new technology, it only costs VND 500 million. Four months ago, Ho Chi Minh City opened a venue to pilot the pollution of Hoan Kiem lake. When Redoxy-3C that German scientists provide for Hanoi is released, the lake water will be clean and clear. In addition, TP will also dredge sludge and comprehensive treatment of this lake.

Redoxy-3C is environmentally friendly. The composition has three effects is the removal of metal cations such as Al, As, Cd, Cu, Pb. Remove the armoni Oxidizing inorganic and organic pollutants. This product has been tested in many lakes and ponds in Hanoi. The physiological parameters do not exceed the threshold allowed for aquatic species to grow and develop. Floating plants on the lake are not affected, more oxygen in the water.[Vietq,]

After water treatment with Redoxy-3C, usually after 24 hours, the lake water will return to green. Prior to use, ponds and lakes will be sampled repeatedly at various times for laboratory analysis and processing. When determining the required dosage, a number of scientists and functional forces will be deployed directly in ponds and lakes. Hanoi Redevelopment Company Limited said that the application of Redoxy-3C technology is effective, with the cost reduced about 2/3 compared to before.

According to the statistics of the Hanoi Drainage One Member Co., Ltd., 80 of them have been treated in the inner city and suburban areas. With the large amount of Redoxy-3C imported in the coming time, Lunar New Year, TP will ensure processing all the lakes in the inner city and some suburban. In the first quarter of 2017, all the lakes in the area were processed.

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