

Surveillance study on Kojima lake regional sewerage systems for preventing global warming		
Whole term	2000.8 ~ 2001.3	
<p>(Purpose)</p> <p>In the Third Conference of the Parties [COP3] to the UN Framework Convention on Climate Change in Kyoto held in December 1997, it was decided that Japan should reduce the amount of greenhouse gases discharged in 2010 by 6% compared with that of 1990, and in June 1998, the Government established a measure to counter global warming that the Government should urgently promote, namely, “Outline of Global Warming Countermeasure Promotion.”</p> <p>Furthermore, the Government promulgated the “Law Concerning Promotion of Global Warming Countermeasures” in October 1998, which came into force in April 1999. This law obligates the Government and local self-governing bodies to work out an action plan to inhibit the emission of greenhouse gases that they discharge and publicly announce the action plan and how they are implementing the action plan.</p> <p>Under such circumstances, in this examination we intended to perform a fact-finding survey of greenhouse gases (CH₄, N₂O) generated from the Kojimako Basin Purification Center of the Okayama Prefecture Kojimako Basin Sewerage, grasp the amount of greenhouse gases generated therefrom, estimate the amount of greenhouse gases to be generated in the future, and study the measures for reducing greenhouse gases to help study the global warming countermeasures in the Okayama Prefecture Kojimako Basin Sewerage.</p> <p>We carried out this examination jointly with Okayama Prefecture in 2000. We studied measures for energy saving from the viewpoint of the change in an operating method of each process constituting the sewerage system and of an alternative system and alternative energy-saving equipment based on the fact-finding survey of greenhouse gases. Besides, we studied the effective use of unused energy to supplement them, conducted an overall assessment on the possibility of realizing them, and established warming countermeasures of up to 2005 as a basic plan.</p>		
<p>(Result)</p> <p>In our joint research of 2000, we implemented a fact-finding survey of greenhouse gases (methane: CH₄ and dinitrogen monoxide: N₂O) from the treatment process, estimated the total amount of greenhouse gases emitted from the Kojimako Basin Purification Center, studied eight kinds of warming countermeasures and established a action plan of up to 2005.</p> <p>(1) The electric power consumption of the Kojimako Basin Purification Center registered about 17,500,000 kWh a year in 1999 and 0.78 kWh per unit quantity of water in accordance with the increase of the amount of treated water and implementation of advanced treatment.</p> <p>(2) It has been made clear from the fact-finding survey that in this Purification Center, the amount of CO₂ discharged is about 7,136 t-CO₂ per year (94.1%), the amount of CH₄ discharged is about 158 t-CO₂ per year (2%), and the amount of N₂O discharged is about 286 t-CO₂ per year (3.7%). It has been thus made clear that almost all of the greenhouse gases is the emission of CO₂ generated from the use of electric power and fuel.</p> <p>(3) Concerning (a) energy-saving operation of an anaerobic tub, (b) use of solar energy (photovoltaic power generation), (c) adoption of high-efficiency motors, (d) renewal of dehydrators, and (e) use of sewage heat, we worked out an eight-step warming countermeasure implementation plan in consideration of the degree of difficulty of these items as the global warming countermeasures of this Purification Center, and calculated and assessed the effect of the warming countermeasures.</p> <p>a. It is possible to reduce greenhouse gases by 5.19% by normalizing the scale of facilities in accordance with the increase of the amount of water to be treated in the present plan, and by 9.9% by implementing the eight-stage warming countermeasures, after all by 15.1% in total per year.</p> <p>b. The economical efficiency to be obtained by implementing the warming countermeasure implementation plan is such that the effect of energy saving is about 48,000,000 yen, whereas the total sum of costs for construction required for warming countermeasures and costs of maintenance thereof is about 24,000,000 yen. The difference is 24,000,000 yen per year, which is the economical effect to be produced therefrom.</p>		
<p>(Future tasks)</p> <p>As countermeasures which we can carry out immediately, the following items are enumerated.</p> <p>(a) Energy-saving operation of the anaerobic tub which does not have a bad influence upon sewage treatment</p> <p>(b) Study of the introduction of photovoltaic power generation and verification of the effect of reducing greenhouse gases</p>		
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