

DETERMINATION OF PHOSPHORUS AND SILICON
COMPOUNDS IN SEIU RIVER BASIN,
HONGKONG

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DETERMINATION OF PHOSPHORUS AND SILICON COMPOUNDS IN
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PROJEK PENYELIDIKAN I DAN II**

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LIST OF ABBREVIATION

%	percent
DOE	Department of Environment
INWQS	Interim National Water Quality Standards
PO ₄ ³⁻	phosphate
P	Phosphorus
Si	Silicon
ppm	part per million
ppb	part per billion
ppt	part per trillion
mg/kg	milligram per kilogram
et al	and others
K	Kelvin
gcm ⁻³	gram per centimeter cube
mol/dm ³	mol per decimeter cube
mgL ⁻¹	milligram per liter
°C	degree Celsius
g	gram
kg	kilogram
nm	nanometer

μm	micrometer
cm	centimeter
m	meter
km	kilometer
PE	polyethylene
min	minute
OP	orthophosphate
TDP	Total Dissolved Phosphate
TPP	Total Particulate Phosphate
DSi	Dissolved silica
TDSi	Total Dissolved Silica
TPSi	Total Particulate Silica
TSS	Total Suspended Solid
DO	Dissolved Oxygen
UV	Ultraviolet

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ABSTRACT

Nutrients are the essential elements for the biochemical reactions and growth of all living things. The presence of excess nutrients in the natural water may lead to the problem of eutrophication. This study was carried out to determine the water quality in Setiu River. Parameters measured were phosphorus compounds (orthophosphate, total dissolved phosphate and total particulate phosphate) and silicon compounds (dissolved silica, total dissolved silica and total particulate silica). The methods used were based on standard colorimetric methods. The results obtained were in the range 0.87 – 9.56 ppb P for orthophosphate, 2.14 to 27.5 ppb P for TDP, 0.53 to 184.0 ppb P for TPP, 1680 to 7110 ppb Si for DSi, 2880 to 7420 ppb Si for TDSi and 4.47 to 250.0 ppb Si for TPSi. Station S6 recorded highest concentration for orthophosphate, TDP and TPP throughout the study. The sources for the phosphorus compounds in Setiu River were from domestic effluents, runoff and the land clearing. However, Station S2 recorded the highest concentration for DSi, TDSi whereas highest TPSi was recorded at station S7. It was believed that main source of silicon compounds in the Setiu River Basin was from the natural source as there was no significant human activities attributed to the enrichment of silicon compound in this area. In conclusion, the level of phosphorus and silicon based nutrient still under the natural level based to the Interim National Water Quality Standards of Malaysia (INWQS).

PENENTUAN SEBATIAN FOSFORUS DAN SILIKON DI LEMBANGAN SUNGAI SETIU, TERENGGANU

ABSTRAK

Nutrien adalah unsur penting untuk tindak balas biokimia dan pertumbuhan benda hidup. Kehadiran nutrien berlebihan dalam air semulajadi akan menimbulkan masalah eutrofikasi. Tujuan kajian ini adalah untuk menentukan tahap kualiti air di Sungai Setiu. Parameter-parameter yang diukur adalah sebatian fosforus (ortofosfat, jumlah fosfat terlarut dan jumlah fosfat partikulat) dan sebatian silikon (silika terlarut, jumlah silika terlarut dan jumlah silika partikulat). Kaedah yang diguna adalah berdasarkan kaedah kolorimetrik. Keputusan yang diperolehi dalam kajian ini adalah dalam lingkungan 0.8–9.56 ppb P untuk ortofosfat, 2.14 to 27.5 ppb P untuk jumlah fosfat terlarut, 0.53 to 184.0 ppb P untuk jumlah fosfat partikulat, 1680 to 7110 ppb Si untuk silika terlarut, 2880 to 7420 ppb Si untuk jumlah silika terlarut dan 4.47 to 250.0 ppb Si untuk jumlah silika partikulat. Secara keseluruhan, stesen S6 mencatatkan nilai kepekatan tertinggi untuk ketiga-tiga sebatian fosforus. Sumber-sumber untuk sebatian fosforus adalah daripada pembuangan sisa-sisa perumahan, air larian dan aktiviti-aktiviti pembersihan tanah. Manakala stesen S2 pula mencatatkan bacaan kepekatan tertinggi untuk sebatian silikon. Punca-punca sebatian silika ini adalah dipercayai daripada semulajadi kerana tidak ada aktiviti-aktiviti manusia yang akan memperkayakan kandungan sebatian silika dijalankan di kawasan sekitar. Secara kesimpulan, nutrien-nutrien fosforus dan silika masih dikategori dalam tahap semulajadi berdasarkan Piawai Interim Kualiti Air Kebangsaan (INWQS) Malaysia.