隧道對水庫之影響與保護-以北宜直鐵為例

鄭佳邦 李魁士 謝文誠 許志宇 王豐仁
交通部鐵路改建工程局 台灣世曦工程顧問股份有限公司 臺北市應用地質技師公會

摘　要

台灣地區地質條件複雜且地下水含量豐沛，一旦基礎設施路廊行經水庫或水質水量保護區內，應審慎評析工程對水量、水質及水庫淤積等之影響並保護。茲以北宜直鐵為例，藉由詳盡地質調查掌握隧道沿線遭遇之地質與水文狀況；並參考國五雪山隧道施工與營運期間隧道湧水量之監測成果，回饋並以解析解法及數值法評估北宜直鐵隧道可能對水量、水質及水庫淤積造成之影響，並研擬可確保水庫、水質水量保護區環境之具體保護對策。

關鍵字：水庫、水質水量保護區、水源特定區、隧道湧水。

Reservoir Impacts and Protection Due to Tunneling – A Case Study of Taipei-Ilan Railway

Chia-Pang Cheng
Railway Reconstruction Bureau, Ministry of Transportation and Communication
Kweishr Li　Wen-Cheng Hsieh　Chih-Yu Hsu
CECI Engineering Consultants, Inc., Taiwan
Feng-Jen Wang
Engineering Geologist Association of Taipei

Abstract

The geological conditions of Taiwan are complex in mountain area with abundant groundwater. The impacts of infrastructure passing through the water quality and quantity protection area shall be assessed. The assessments of water quantity, water quality and reservoir deposits problem are essential. To assess the impacts of Taipei-Yilan railway on the groundwater environment, the geological and hydrogeological conditions of the tunnel sites were carefully investigated. The Hsuehshan tunnel inflow monitoring data during construction and operation was also referred and analyzed. The tunnel inflow quantity is evaluated using analytical and numerical models. The water quality and reservoir deposits problems induced by Taipei-Yilan railway project were also evaluated. Several countermeasures were proposed to mitigate the adverse impacts of the project on reservoir and the water quality and quantity protection area.

Key Words： reservoir, the source of tap water quality protection area, water source special district, tunnel inflow.

一、前　言

台灣東西部間受山區阻隔，既有鐵路路線彎繞耗時，且受限路線容量，計畫於臺北-宜蘭間新設雙股北宜直鐵路廊，疏解交通。北宜直鐵研選主要之路線方案如表一及圖一所示。

台灣位處歐亞大陸板塊與菲律賓海板塊