

低孔排渾對渾水潭交界面動水沈降特性之影響

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摘 要 石門水庫近年來常受颱風沖刷大量坩泥入庫所形成的渾水潭所苦，高濃度坩泥的渾水潭不但影響民生用水的取水與處理，落淤後的坩泥更易掩埋既有的取水口與排水口。本研究以均勻斷面之矩形沉降槽與大型沉降筒進行石門淤泥的靜水與動水沉降特性試驗。靜水沉降方面，清渾水交界面的靜水沉降速度與坩泥濃度成一幕次關係，初始濃度愈大，坩泥靜水沉降速度愈慢。動水沉降部分，入流所造成的界面上升速度會因坩泥本身的沉降特性而略小於實際入流所造成的上升速度。於有出流的條件下，清渾水交界面的下降速度幾乎等於出流所造成的界面下降速度加上泥砂本身的靜水沉降速度。若出流量所造成界面下降速度遠大於泥砂本身的沉降速度時，出流條件對清渾水交界面沉降速度的影響會遠大於泥砂本身沉降速度的影響，於此條件下出流則為主要影響清渾水交界面下降速度的主要因素。

關鍵詞：渾水潭、沉降槽、清渾水交界面、沉降速度。

Falling phenomenon of muddy-pond interface due to outflow through lower outlets

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ABSTRACT High concentration sediment is usually scoured into Shi-Man reservoir by typhoons. High concentration cohesive sediment was brought to the dam site and formed a muddy pond increasing the difficulty of water treatment. A small settling flume and large settling column were used for stagnant and flowing deposition experiment and Shi-Man mud was used to form a muddy pond. There was a power relation between stagnant settling velocity and initial concentration of Shi-Man mud. The stagnant settling velocity would decrease when the initial concentration increased. For the inflow cases, the raising velocity of the muddy-pond interface was smaller than the raising velocity caused by inflow discharge, because there was a decelerating condition caused by the deposition of Shi-Man mud. For the outflow cases, the settling velocity of the muddy-pond interface almost equaled the summation of the stagnant settling velocity of Shi-Man mud and settling velocity caused by outflow discharge. If the settling velocity caused by outflow was much bigger than the stagnant settling velocity of Shi-Man mud, the settling velocity of the muddy-pond interface was mainly influenced by the outflow condition.

Key Words: muddy pond, settling flume, muddy-pond interface, settling velocity.

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