

Large or small?

IWP&DC asked members of the US dams industry for their thoughts on whether dam size matters, and what are the prospects for future construction across the country?

“The future of US dams is dependent on the right dam (large or small), at the right location, at the right time.”

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Are the days of constructing large US dams finally over? Absolutely not. There is still a considerable need for water storage, flood control and clean/reliable hydropower energy across the United States. However, the mature nature of the American industry means new projects will need to be vetted to a much deeper environmental and socio-economic standard than past historical periods of large dam development. As an example, the Olivenhain Dam – a new 91m high dam in San Diego was completed in 2006 and Alaska is getting closer to making the 215m high Watana Dam a reality after three decades of planning.

Both large and small dams have always been a critical part of the infrastructure that serves the geographically and economically diverse population of the US. However, both also provide risk to their owners. These risks need to be addressed through ongoing inspection and maintenance, so the asset and the population at risk downstream are



Views of Olivenhain Dam in San Diego. Photos Courtesy of San Diego County Water Authority.

protected from potential impacts such as extreme floods, earthquakes, as well as, the day-to-day ageing process that will weaken structures and mechanical/electrical systems over time.

The environmental concerns of all dams – large and small – are similar and should be held in high regard to the design engineer and owner. Large dams often overshadow smaller dams due to their design, construction complexity, or even their sheer size like Hoover Dam. Large dams also overshadow smaller ones when it comes to consequences of failure, thus the dam safety profession must always work to minimise these risks to protect lives and property. However, depending on the downstream development, a smaller dam could have similar risks to life and property and tendencies to relax dam safety surveillance for smaller structures is



extremely unwise.

There are many lessons that have been developed in our industry for the design and construction of large dams that have been successfully applied to smaller dams. For example, the innovative design, materials and construction methods of RCC at Olivenhain Dam have been applied to large and small RCC dams in the US and around the world.

While it may seem that the age of the large dam is over, it is not. There are many areas across the United States as well as the world that need significant sources of hydropower, water supply or flood protection that can only be met by the construction of a dam. Certainly the developers of the Olivenhain and Watana Dams would argue that the benefits of these single large dams provide a much more significant benefit than four or five smaller dams trying to provide the same infrastructure service with significantly more environmental and socio-economic impacts. Large or small, however, a dam must have a sustainable purpose and operating mission to provide a greater benefit than the environmental impacts of its existence or the risks associated with its ageing structure. Once a project moves to a negative benefit situation, the owner must consider refurbishment, re-tasking or removal to meet that critical balance of risk and reward. The future of dams in the US is dependent on the right dam (large or small), at the right location, at the right time.

