

CASE STUDY

Lake Mead, Las Vegas
Low Suction submersible sets



INDAR SP UGP

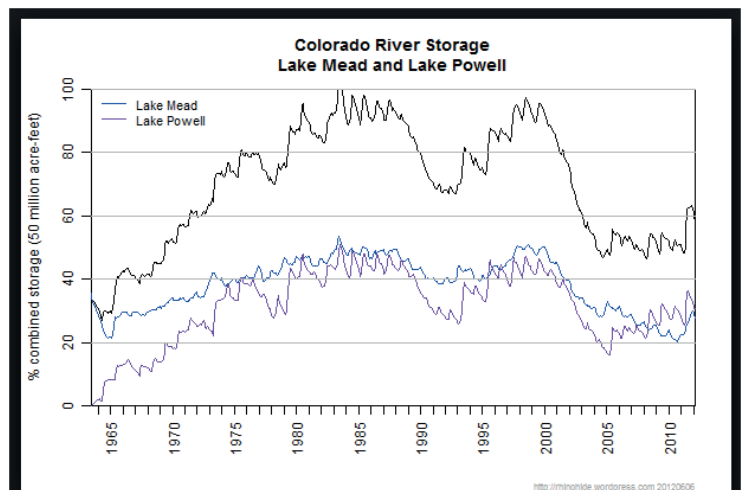


Lake Mead is the largest fresh water reservoir in the United States in terms of maximum water capacity. It is on the Colorado River about 39 km southeast from the Las Vegas Strip at border of the state of Nevada and Arizona.

Shaped by the Hoover Dam, Lake Mead is 180 km long and when the lake is full, it has 1221 km of shoreline; it is 162 m at maximum depth, with a surface elevation of 372.3 m above sea level. It has 640 km² of surface, and when reaching full capacity, the volume is 35 km³ of water. However, the lake has not reached this capacity since 1983 due to a combination of drought and increased water demand.

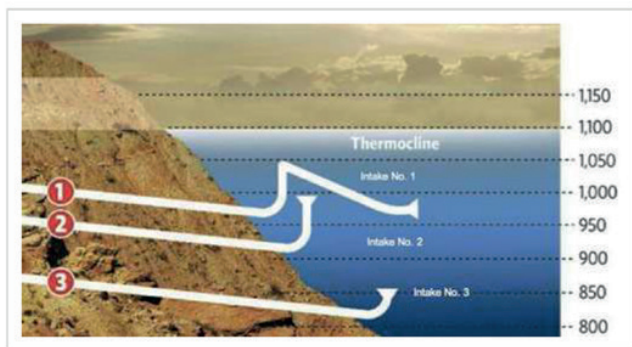
Lake Mead reservoir got recently its lowest water level since the lake was first filled during the construction of the Hoover Dam in the 1930s, according to the Bureau of Reclamation.

A new Pumping Station (PS-3) has been projected. Lake Mead PS-3 substantially increases the reliability and flexibility of Southern Nevada's water treatment and delivery system. Combined with this low lake level pumping station that is



Indar
Ingeteam Group

currently under consideration, the new intake system enhances the SNWA's existing water supply, allowing continuing accessing its water resources at the very bottom of the lake, even if lake elevations drop very low for the Hoover Dam to release water to downstream users.



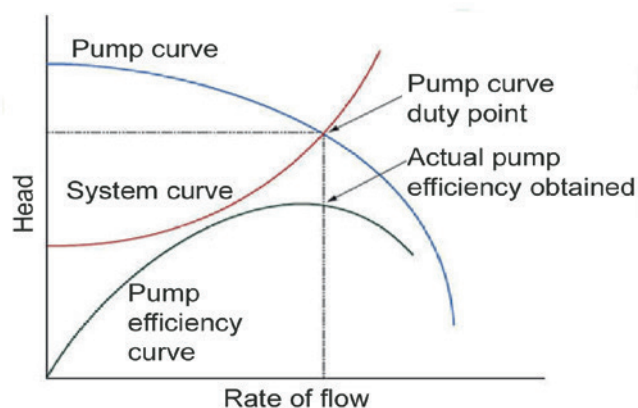
The intake is designed to maintain SNWA's ability to draw water from the Colorado River basin, at lake elevations as low as 300 m above sea level. This will ensure the needed system capacity if lake levels fall below the elevation capacity of the existing PS-1. PS-3 avoids interruptions of continuous water supply to Municipalities and end-users in the event declining lake levels.

INDAR supplies its larger ever pump

The INDAR Series SP UGP is the right answer to this challenge.

The INDAR Series SP UGP pump sets are made of a multistage centrifugal pump up and an INDAR SUBMERSIBLE ML type electric motor. (ISM)

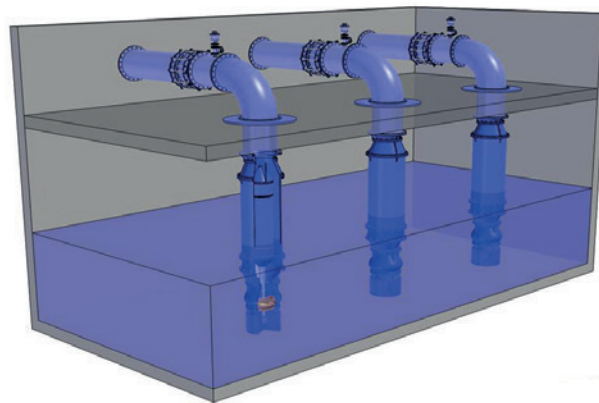
Standard submersible pump sets for operation in a vertical position are normally configured with the motor below and the pump above; however, there are situations like Lake Mead, where the dynamic water level is so low, that the water either will not reach the suction grille of a standard unit, or will operate at a too low level, causing cavitation. For such cases INDAR has developed a submersible pump unit with the motor above the pump (M-Type) and suction intake at the very bottom. The water will be pumped to the surface with several more hydraulic and technical advantages comparing with traditional pumps.



This type of submersible pump set is completely new to the South Nevada Water Authority (SNWA). They are used to pumps that on one hand, take several weeks to install multi-bearing vertical line shafts or other pumps that are not operating at their best with the presently given water levels, on the other hand.

The almost maintenance free operation and ease of installation combined with efficiency pumping such as also high performance, is convincing the water authorities to try Indar low suction pump sets by using an existing intake pipe of IPS-2.

The INDAR pump sets are expected to be installed in 2020.



Model	Type	N° unit	Discharge Bore (mm)	Motor Output (kW)	Voltage (V)	Weight (kg)	Diameter (mm)	Height (mm)
UGP-4145-02 + ML-110S-6/200-NCI	High Lift Pumps (HLP)	12	781	3878	13800	27463	1151	8257
UGP-M-4010-02 + ML-90-6/180	Low Lift Pumps (LLP)	20	800	2345	13800	18500	1410	6830