Understanding Mean Sea Level, NGVD, NAVD

These are all the ways of accurately locating a point on the earth with, in the case of the vertical datum, relation to sea level. NAD 83 is a ***horizontal*** datum, so is not of particular interest to us. The differences take into account increased measurement accuracy due to GPS and other means, plus reflect the fact that the earth is not a perfect sphere but rather what they call an oblate spheroid. I.e., sea level is not the same everywhere relative to the center of the earth even when tides are averaged out.

Mean Sea Level (MSL), which the CoE 1962 design memo refers to, is otherwise referred to as the Sea Level Datum of 1929 and was used from 1929 to 1973. It was superseded by the National Geodetic Vertical Datum of 1929 (NGVD 29), which was used from 1973 to 1992, and that was superseded by the North American Vertical Datum of 1988 (NAVD 88), which has been used since 1992.

These are all different ways of assigning numbers to a given elevation at some point on the earth, referenced to "sea level" as that gets refined. (Note that sea level is not 0.00 everywhere.)

However when Sea Level Datum of 1929 (MSL) and was superseded by the NGVD 29 the numbers didn't change; it was a name change only. So, the 29 ft lake elevation the CoE referenced ***is*** NGVD 29.

To convert to NGVD 29 to NAVD 88 you simply add 3.6 feet. So the 29 ft lake elevation (MSL or NGVD 29) is 32.6 ft NAVD 88.

For a good writeup on this, see: https://c4g.lsu.edu/index.php/ticket-system/faq/IS-NGVD29-THE-SAME-AS-MEAN-SEA-LEVEL-10