DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT CORPS OF ENGINEERS
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REPLY TO
ATTENTION OF

LMNED-S

7 August 1985

SUBJECT: NGS Benchmarks

Commander, Lower Mississippi Valley Division
ATTN: LMVED

1. Reference is made to the following:

a. LMNED letter dated 2 November 1984 to LMVD, subject supra.

b. LMVED letter dated 5 March 1985 to RA John D. Bossler, subject: Adjustments to NGS Benchmarks.

c. John D. Bossler letter to LMVD dated 29 March 1985 in response to reference b above.

d. LMVED-TS letter dated 12 April 1985 to LMNED-S subject: Adjustments to NGS Benchmarks.

e. LMVED letter dated 1 May 1985 to LMNED-S subject: Adjustments to NGS Benchmarks, and 1st End thereto.

2. In essence, it is the position of NGS as set forth in reference c above that the current (1983) benchmark elevations are correct, but that they cannot be used in conjunction with earlier values to derive estimates of subsidence which are necessarily valid even in order of magnitude. Thus we are left with a problem of setting project grades to provide the level of protection authorized. The problem is particularly acute on projects which are partially complete, in that, if we adopt the new benchmark elevations for construction without altering design flowlines, we ensure that those projects will provide inconsistent levels of protection; with the previously constructed portions offering lower levels of protection than those to be constructed in the future. At the same time, it would hardly be prudent, based on what we now know about benchmark elevations, to embark on a program of wholesale raising of previous construction to conform to the latest elevations. This is particularly true in situations in which design flowlines are primarily a function of discharge with tide level having little effect, and in tidal cases where increases in grade can only be achieved through demolition and reconstruction.

3. The problem extends as well to our stream gaging network since the gages which comprise that network are ordinarily adjusted to conform to the latest information published by NGS. As an example, consider the Carrollton gage, which is typical of gages at and below New Orleans. It has been raised about 0.6 foot since 1952 (1983 data have not yet been applied) with the result that the reading of the staff now corresponds to a reading 0.6 foot lower on the 1952 staff. Application of the 1983 data would result in raising the staff another half foot or a total increase of over 1 foot.

4. The problem is exacerbated by the information, recently received, that the 1983 data have been superseded by the results of releveling done in the New Orleans area at the request of local officials. New elevations for benchmarks in Jefferson, St. Bernard, Plaquemines, and Orleans Parishes have been published which, in most instances, represent significant upward revisions of the 1983 data. Additional results of the releveling are being processed and it seems reasonable to expect that they will reflect the same upward trends. The overall significance of these changes in the light of the repeated and ringing affirmations of confidence in the 1983 data which appear in NOAA's letter of 29 March 1985 is not easy to assess, but it does further weaken the case for imputing, with any reasonable confidence, hard physical significance to the changes in benchmark elevations. Yet the data promulgated by NOAA, given their presumed primacy in deciding where the earth's crust is in the vertical plane, cannot be ignored.

5. While the NGS program (cadastre) for evaluating subsidence may well produce data relevant to our problem (and for this reason alone, we would be well advised to support it) that program offers litle of utility in the foreseeable future. Thus we must select a course of action without material assistance from NGS.

6. Despite the absence of firm implications to be drawn from changing benchmark data, we believe that a clearly defined policy should be derived concerning the use of benchmark data in our various activities. Accordingly, we propose the following actions:

a. All gages will be set to conform to the latest available benchmark information published by NGS. Since both the gage information and the NGS data are widely disseminated, to do otherwise would be to court public confusion.

b. Modification of projects which have been completed will not be considered. The level of precision in the current data, and the practical difficulty and cost of changing such projects combine to mandate this course of action at least for the foreseeable future.

c. The main stem features of the MR&T project, such as MRL and Atchafalaya Basin, will be constructed utilizing the latest pre-1983 benchmark elevations. The grade requirements for these features are driven primarily by discharge and since subsidence presumably affects both bed and banks, required levee heights should be little affected by it. Thus, a shift to the new, lower benchmarks would result in the construction of levees higher than required to provide the authorized level of protection. There may be some problem with this approach at the lower (gulfward) ends of the system where tide becomes an increasingly important factor, and we plan to give that continuing consideration.

d. Off-main stem projects of the MR&T which are under construction or will be constructed in the future will use the latest benchmark data published by NGS at the time construction is/was started. The need for revision will be considered as construction proceeds.

e. All O&M dredging will use the latest available benchmark data published by NGS prior to the 1983 data. A change to the new data would mean that the depth of dredging in Southwest Pass, for example, would be lowered by about 1 foot. Given the perennial commotion by navigation interests, and considering the intensity of it this past year, such a course of action would be ill advised to say the least.

f. Hurricane protection projects which are partially complete will use the NGS benchmarks current at the time of construction of the first increment of the project. To shift to the later NGS data without altering the heights of previously constructed portions would make "fuseplugs" of those portions and thus impose a gratuitous servitude on the lands and facilities they protect. And altering previously constructed works would not be practicable.

g. New hurricane protection projects will be constructed using the latest available NGS benchmark data.

h. We plan to respond affirmatively to NOAA's invitation to participate in this "cadastre" program to better evaluate subsidence. Based on NOAA's estimates, the total costs would be $2.0 million in the first year, $525 thousand in the second year, and $345 thousand annually thereafter. Our participation would be in the form of membership on technical study groups and providing data. We do not, at this time, anticipate providing any direct funding.

7. Approval of the course of action set forth in paragraph 6 is recommended.

FOR THE COMMANDER:

Encls

FREDERIC M. CHATRY
Chief, Engineering Division