Wide Ruins
*Navajo

For report and papers in Envelope.

September 4, 1919.

Mr. H. F. Robinson, Supervising Engineer,
U. S. Indian Service,
Albuquerque, New Mexico.

Dear Mr. Robinson,-

Referring to your letter of August 21, enclosing report of Mr. Post on the proposed Wide Ruins project

I have given the report and designs some study and will make a few remarks on same.

Precipitation. The data presented is probably as near accurate as can be obtained and can therefore be used for purposes of passing upon the feasibility of the project. It is greater than I really expected in that longitude but the altitude evidently has considerable effect.

Runoff. I am unable to check the calculations under the heading "Physical Features" - it is stated that the drainage area is 150 sq miles and that the runoff is calculated by using 20% of a 11 inch rainfall. You will readily see that there is something radically wrong in the calculation when the runoff from this area only amounts to 2,900 acre feet. It really amounts to 17,600 acre feet from this method of calculation. I presume that 2,900 is near the actual runoff but cannot see how it is arrived at.

Silt and Sediment. If the water spreads out over a large area and approaches at a slow velocity it is obvious that the silt

would be deposited. If this is true in this particular case there will be evidence of delta being built up under existing conditions. The topography as shown on the sheet submitted indicates that there is no well defined channel and as the fall is quite heavy it means that but little water runs there or that it runs in short periods not sufficient to soften the ground and start erosion. Wide Ruins Wash seems to be a much better defined water course and probably the source of a greater water supply. It seems to me that there should be some physical marks on the ground that would have indicated flood heights and this with the fall of the valley would have made possible a calculation of the maximum discharge. This would not indicate the amount of available water but would have thrown some light upon the amount of water that might have to be provided for by the spillway.

<u>Reservoirs.</u> The reservoir is described as "well suited for its purpose etc". Of course if there is no water to store the site does not amount to anything. The map or profile does not show the location of the rock which is referred to for connecting with "a cutoff wall". There should have been shown the position of the underlying rock, a profile of the rock as well as the earth, if the rock is within usable distance.

<u>Dam.</u> The top width of 10 feet on a low dam is sufficient but the water side slope should be greater than 2½ to 1, three to one is the minimum and 3½ to 1 is better. The other side can be less, 1½ to 1 being sufficient with some soils. There should be more specifications as to rip rap on the face of the dam, it should also be shown on a section of the dam. According to the plan of the gate, the opening would be entirely too small. If you

will note the design, you will see that the gate could not be opened but a little. It would meet the concrete after sliding only about 1/3 its length. You will also note that there is no protection against the water reaching the outlet tube and creeping along thru the dam and probably causing failure. The design should be corrected, making changes at the "guard wall" and placing intercepting collars along the tube.

Spillway. I note that the bottom of the spillway is placed on a level with the top of the dam. The dam would fail before the spillway came into action. The spillway is also too small, even if there is 4' safety as mentioned it would not discharge the waters that I have seen originate in a very short distance during a cloud burst in the arid sections. The surface of the reservoir would aid some but it is small and I would not dare to depend upon such a minature spillway. The spillway as you will note discharges directly across the ditch and would ruin it in a few minutes, when in action.

The ditch is to have many drops. No profile of the ditch or design of drops are furnished. The estimates are too low. Concrete in such small structures, so far from civilization and with transportation so high, cannot be built at the present time for $15.00 per cu. yd. I also doubt the rock excavation being done for the price mentioned.

I think you had better give this your personal attention and submit a full report with designs, estimates, etc., that you will be willing to approve.

Very truly yours,

Chief Engineer.