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Richard Ballinger

February 25, 1915.

Mr. H. F. Robinson,

Superintendent of Irrigation,

Albuquerque, New Mexico.

Sir:

Your letter of the 11th instant was received at Los Angeles after I started on my return to Washington.

The amount of the authority for this work is $10,000, and it will be transferred from Mr. Coultis to you in a few days. The authority reads--

> For all purposes necessary for the construction and tests (including installation of pumping plants for this purpose) of wells on the Navajo Extension reservation in Arizona.

There will be no reason why this fund should not be slightly increased, as it is from "Irrigation, Indian Reservations, Reimbursable", provided there are good reasons for desiring the expenditure of more money.

The size of wells I expected to determine as the work progressed, although I believe 12" screen would be the proper size to begin with, using 16" casing to sufficient depth, so that the Layne & Bowler type of pump, or similar deep well centrifugal pump could be installed, at a sufficient depth that with a suction drawdown of 15 or 16 ft.

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below it we could secure all the water available at the maximum lift which we could economically consider. I should think this would be not to exceed 50 ft. from the ground surface.

I asked Layne and Bowler to mail you a copy of their catalogue which would give you accurate ideas of their type of screen. They have doubtless done so by this time. Their method of drilling entails the sinking first of the test hole , by means of which they screen and classify the material through which they pass, and when the final hole is installed they use screens with the wire bound with the proper spacings to admit water from the various classes of water bearing strata.

It may be that the only feasible method of paying for these wells will be on a per diem basis for the use of the rig until the country is slightly proven, although I would like to have some scheme, if possible, worked out so that there will be an incentive to the well drillers to make rapid and satisfactory progress.

I had no definite locations chosen for these experiments, except the various small bottom tracts lying at the foot of the mesas along the Little Colorado. I believe there are many partially detached areas of from a few to several hundred acres in extent, where the water would probably be close to the surface and many feet of water bearing sand encountered. If we can have the whole depth of water bearing materials screened, it would seem that we could get a considerable supply. At least, the Navajos are so ener-

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getic and appreciative of any efforts to secure additional irrigating water, that I felt that this money could well be spent, especially as if even a meager supply is secured by the well, too small to be useful for irrigation, the wells, if at all widely scattered, would be useful for stock water during the periods of drouth in the Little Colorado. Of course, the first wells should be drilled at the points most favorably located, where the soil is as good as we could expect, and comparatively close to the railroad, so that the rig could be moved gradually, perhaps drilling two or more wells at each particular basin if the first well was of such a character that these seemed justified. I would like to visit this work some time, as I have always been very much interested in this plan, which, as you know, includes the erection of a power plant at the railroad and the transmission of power to pump the wells, provided we secure an adequate and satisfactory supply of water at enough localities to justify this. I do not feel that the quality of water which they secured at Leupp will be detrimental to land, if carefully and scientifically handled. I believe the Navajo could be taught to irrigate with this kind of water, where there is good sub-drainage, so that they would soon be at least more competent than the average Government employe who has been at Leupp.

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Referring again to the matter of compensation of the well drillers, you can see the objection to paying simply by the day is not only due to the possibility of their not prosecuting the work energetically, but that it would almost necessarily require the presence of a Government man on the work at all times to protect our interests. This, however, may be the one solution of the difficulty, and if you can find somebody whom you can trust, and who knows something of underground water development, it might be best to employ such a man and keep him on the job all the time. He could go exploring ahead of the rig to determine where the new well should be drilled, and probably keep busy to advantage.

Yours very truly,

F.K. Chanck

MMcC

Assistant Inspector of Irrigation.

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