Memorandum

To: Chief Engineer

From: Acting Head, Research and Geology Division

Subject: Installation of test equipment in discharge lines--Tracy Pumping Plant--Central Valley Project, California.

1. A memorandum from A. E. Glover dated May 5, 1948, together with one from I. A. Winter dated August 3, 1948, outlined certain field tests to permit verification of the theoretical analysis made in connection with the design of the pump discharge lines for Granby and Tracy Pumping Plants. The measurements are particularly desirable since the analysis of the hydraulic conditions shows that negative pressures will occur in the pump discharge lines following a power failure. Although separation of the water column is not anticipated, the actual pressure conditions can only be ascertained by field measurement. The program in connection with the Granby Pumping Plant will be handled at a future date by separate memorandum.

2. Your penciled note, returning the two memoranda to Mr. Glover, stated in part: "The tests should be made at the time these plants are first placed in operation. ... Please hold in abeyance until, say about 6 months, prior to the operating dates and then resubmit." While it is recognized that it is now appreciably more than 6 months prior to the initial operation of the Tracy Pumping Plant, it is desirable to request your approval to install certain test equipment in the discharge lines during the construction period.

3. The discharge lines are at present under construction and easy access may be had to their interiors. This will facilitate greatly installation of connections through the walls of the pipe for measuring hydraulic pressures. The contractor is making rapid progress on this job and in a short time the lines will be closed. After closure it will be extremely difficult and somewhat expensive to install the piezometer taps because of the unusual dimensions. The end of the piezometer openings in contact with the water prism and an area around each must be smooth. In order to accomplish this operation it will be necessary to provide scaffolding to work from. After closure of the lines it will be difficult to get this scaffold material to the proper place and removed before operating the plant because of the great length of conduit. If the piezometer taps are installed now and the
necessary piping deferred until the time of testing, the cost will be many times less than the cost of installation after the discharge lines are completed.

4. Approval is requested for installation of six piezometer taps as shown in red on the attached prints, Figures 1, 2, 3, and 4. Details of the taps will be similar to those shown in Figure 5 but all piping layouts may be deferred until the tests are actually made.

CC-J.J.Burnard  
R.E.Glover
Memorandum

To:          Chief Engineer
From:        I. A. Winter

Subject:  Granby Pumping Plant—Colorado—Big Thompson Project—Tracy Pumping Plant—Central Valley Project.

1. Reference is made to Mr. Glover's memorandums dated May 5, 1948, subjects as above.

2. It is recommended that the tests outlined in Mr. Glover's memorandums be conducted at both Granby and Tracy Pumping Plants. It is believed the cost of performing this work will be nominal and the data obtained will be necessary to indicate the adequacy of the designs of the present discharge pipes and will serve as a basis for final adjustment of the various control features. This work could be coordinated, with the acceptance tests, to take advantage of the presence of manufacturer's representative and other technical personnel who would be available at the plants during official acceptance tests.

3. It is our usual practice to include in the hydraulic equipment specifications, pertinent operating instructions to serve as a guide for the plant operators in avoiding excessive pressure rise in the discharge pipes and other essential operating features. These instructions are augmented by appropriate instructions placed on the general arrangement drawings and operating diagrams, and manufacturer's instructions. Should the plant tests indicate any modifications in these instructions, appropriate steps will be taken to assure that the operators are fully informed as to the revisions in these instructions.

CC—H. S. Byther
F. B. Follum
H. H. Plumb
I. L. Wightman

J. A. Winter
Denver, Colorado
May 5, 1948

Memorandum

To: Chief Engineer

From: R. E. Glover

Subject: Test of Tracy Pumping Plant — Central Valley Project.

1. Introduction

By letter of March 1, 1948, from the Acting Chief Engineer to Director of Region 2, Sacramento, California, subject "Elimination of Surge Tanks, Central Valley Project," the Region was notified that due to difficult foundation conditions and high cost it had been decided to proceed with the design on the basis of the elimination of the three surge tanks. This decision was made following the completion of the analysis which took into account certain favorable changes of profile, the flywheel effect of pumps and motors, pump characteristics, and valve operation.

2. Pressure Tests

Since analyses of the hydraulic conditions show negative pressures occurring in the penstock following power failure, it is considered advisable to conduct a pressure test to determine the actual operating condition as soon as the plant can be operated. It is suggested, therefore, that one of the Bureau's oscillograph trucks, provided with special pressure-cell equipment, be sent to this plant to conduct a test at the time the motors and pumps are tested. The tests should include measurement of pressure variations on both the intake and discharge sides of the pump and at several points along the penstock where negative pressures may be expected to occur.

The measurements would be recorded by the oscillograph, together with such supplemental data from the electrical and mechanical systems as would permit a comparison of the results of these tests with the data obtained from the analyses. If, as a result of these tests it is found that the pressure conditions are less favorable than the computations would indicate then measures can be taken to rectify them. It is anticipated that the first unit of this plant will be ready to operate by August of 1950, and the whole plant will be in operation by the Spring of 1951.
3. **Recommendations**

It is recommended that authority be given at this time to arrange for the making of these tests, and for the purchase of pressure-cells, wire, or other accessory equipment which might be necessary. It is estimated that the cost of this series of tests, exclusive of overhead, but including the cost of accessory equipment would be $2,000.

[Signature]

Robert E. Glover
Head, Technical Analysis Section