Binkley Associates, Inc.

CONSULTING ENGINEERS

HYDRAULICS · WATER RESOURCES · WATER AND SEWAGE FACILITIES

July 12, 2016

VIA EMAIL ONLY

Pete Kampa
General Manager
Lake Don Pedro Community Services District
9751 Merced Falls Road
La Grange, CA 95329

RE: Intake Report

Dear Pete:

On June 21, 2016 we visited the intake site to observe the fixed-intake 200 horsepower pumps startup. These pumps have been off for several years due to the drought. Present at the site were myself, Randy, Jose, and from Martech: Rick Leddy with three additional staff. Following is a summary of the startup. We are awaiting receipt of Martech's report.

Pump #1:
The cable was meggered by Martech and the result was 0 mega-ohms. This can indicate a fault to ground in the cable splice, or motor. A "dry run" was attempted by starting the pump with the cable not connected, to see if the pump control valve would function based on the control signals. Nothing happened. We then tried connecting the pump and starting it, and again nothing happened. Martech staff inspected the wiring in the panel and found a wire had been chewed through by a rodent. Once this wire was repaired, pump #1 did start and we allowed it to run for approximately 15 minutes then shut it off. We note that the pump started instantly rather than after time delay as it should have, indicating a possible problem in the controls (timer). Flow was 1615 gpm measured at the meter. The pressure in the vault read 101 psi, but the gage appeared very corroded and may not be reliable.

Pump #2:
The cable was meggered by Martech and the result was slightly above 0 mega-ohms indicating that there may be a fault. The cover to the flow switch was removed by Martech and they manually toggled the paddle. Martech staff was concerned that it may not be working properly and could stick. A dry run was attempted but nothing happened. When trying to start the pump two times, the breaker tripped almost instantly both times. No air was expelled from the air valve, indicating that the pump impellers did not begin to turn.

Current Operations:
Although we have found that pump #1 does run, Randy is concerned about operating it because the facilities including possibly the fail-safe control system is in a degraded condition. He also expects lake level to fall below the structure again this fall or winter, so intends to continue using the floating pump system for the foreseeable future.

Our calculations indicate that peak efficiency of the float pumps is at water surface elevation 600+/- (approximately 100 feet below the bottom of the intake). At the current water surface elevation of 800+/-, the float pump is operating beyond the end of its curve, so efficiency is low. In addition, operating the pump outside of its design range may be harmful to the pump. Therefore, we advise against using the float at high lake levels. However, we've done a quick calculation and find you can install a piping bypass of the surge tank, open the existing booster pump bypass, and pump directly to the plant from the float without use of the booster pump. Around lake level 800, this would enable the float pump to operate within its design range and more efficiently, and completely eliminate the use of the booster, thereby saving energy.

Conclusion:
Pump #1 is functional, but we were unable to test the fail-safe controls to confirm functionality. In addition, the poor megger test results may suggest that it may have problems in the near future. Pump #2 needs to be removed and inspected, then repaired or replaced.

"Ballpark" Cost Information:
Removal and replacement of one 200 HP submersible pump and cable: roughly $210,000.

Replace existing panels, eliminate pump control valves, add soft starts: roughly $120,000

A number of additional smaller tasks also need to be completed, such as installation of the tubing for remote control of the inlets, sealing building against rodents, etc. These small items are difficult to estimate.

Recommendations:
Due to the high cost of pulling and reinstalling the pumps, the overall deteriorated condition of the original intake infrastructure, the observation that the reservoir is not being operated in the manner that it was when the intake was designed (i.e. lake is routinely drawn below the lowest inlet), and the prospect of continuing/frequent drought increasing the amount of time the intake is above water, it is difficult for us to recommend moving ahead with repair of pump #2 at this time. Please note that we do recommend installation of booster pump #2 at the intake site at this time to increase redundancy and reliability in the floating pump system.

Instead, we recommend moving ahead promptly with an engineering study to identify several concepts and related costs for an entirely new intake structure at the existing site and/or other site(s). Such a study should take into consideration, at a minimum, historic and projected future lake level fluctuation, optimizing power consumption across the range of conditions, redundancy, reliability, operation and maintenance, planning and design, and include rough timelines for design and construction, and consideration of life cycle costs. Refurbishment of the

existing structure, if deemed feasible, can be considered. Modifications to the floating pump system for use as a permanent system can also be considered.

At this time, Binkley Associates is understaffed to complete such a study in a timely fashion, but we would be happy to provide technical input, data, and review on behalf of LDPCSD to an outside consultant.

Regarding continuing use of the float at higher lake levels, we recommend proceeding with the design and installation of bypass piping as soon as possible. This work may be done in conjunction with the installation of booster pump #2.

Please call to discuss.

Very truly yours,
Binkley Associates, Inc.
Engineer for Lake Don Pedro Community Services District

By:_____
Elizabeth A. Binkley, P.E.
Principal

cc: Syndie Marchesiello, Randy Gilgo, Via Email Only