

AMENDMENT NO. 1

San Lorenzo Valley Water District

Notice Inviting Bids

Pasatiempo Well 8 Construction

NOTE: This amendment replaces Section 210 in its entirety from the original Bid Notice issued on May 02, 2018.

SECTION 210

WELL DEVELOPMENT

Bid Items No. 14, 15, 16 and 17

SECTION 210-1 - SCOPE

This item shall consist of air-lifting, zone-pumping and pumping to remove drilling fluids and cuttings and develop the gravel pack and aquifer to maximize the yield and efficiency of each well.

SECTION 210-2 - DEVELOPMENT PROCEDURES

Mechanical Development Procedure

Initial development work shall consist of open-ended airlift pumping at progressively deeper depths until reaching bottom of well. After reaching bottom, air-lifting will continue for a period of 2 hours or until directed by the OTR. During air-lift operations, gravel pack will be topped off as necessary.

Based on the current depth to water at the site, it is anticipated that open-ended airlift pumping will be limited in effectiveness due to insufficient submergence. Accordingly, a submersible pump shall be utilized with a swabbing tool to conduct subsequent zone pumping while swabbing. This procedure will be conducted utilizing a development tool similar to the one shown in Figure 15.16 of Groundwater and Wells (Driscoll, 2nd Edition, page 515). The submersible pump shall be installed within with the development tool; electrical power for the pump is available at the site. The tool will consist of a 10-foot length of perforated pipe with minimum 11-inch diameter flexible rubber wiper on both ends. The tool will be placed to the required depth on a string of discharge pipe. The pumping equipment used for zone pumping shall be capable of pumping up to 100 gpm during development. The discharge pipe diameter shall be sized so that a minimum uphole velocity of 4 feet per second (fps) can be achieved during zone pumping (for example, a discharge pipe diameter of 3 inches can produce an uphole velocity of 4.5 feet per second at 100 gpm discharge rate). At the top of the string, a discharge head shall be configured to divert water through a flexible hose to a discharge tank. Power supply for the submersible pump shall also be connected to a cable reel to allow pump operation while the development tool is being moved in the well. The entire assembly shall be suspended in the derrick in such a manner that

allows the assembly to swab a minimum of 20 feet of screen while simultaneously zone pumping.

The above-described equipment would be installed into the well to the top of the uppermost screen. The screen will be swabbed in 20- to 30-foot sections while simultaneously zone-pumping. Each screen section will be worked until successive swabbing produces little change in color and discharge is relatively clear. Development will continue for approximately 1 hour for each 20-foot interval of screen. This period may be extended or shortened by the OTR based on condition of discharge water. Upon completion of a screen section, additional pipe will be added to the discharge line, and the procedure repeated until all screen sections have been completed.

After reaching bottom of first pass of zone-pumping and swabbing with the development tool, a dispersant, Baroid AquaKleer or Johnson NW-220, shall be swabbed, from bottom to top, into the perforated interval consistent with the manufacturer's specified concentrations. A second pass of zone-pumping and swabbing will be conducted from top to bottom.

It is estimated that mechanical development will require 44 hours. On completion of development of all sections of the screen, the well shall be cleaned to bottom. Development fluids from the well will be directed to a temporary water treatment system prior to discharge to Hansen's Quarry. The specifications for the temporary water treatment system are provided in Section 214. No discharge shall be without the approval of the OTR. No standby time will be allowed for delays caused by Contractor's failure to meet the discharge requirements.

Pumping Development Procedure

Following the development by zone-pumping, the Contractor shall install a test pump capable of discharging up to 600 gpm against 600 feet of total head. The pump setting depth will be provided by the OTR but can be assumed to be approximately 560 feet. The equipment shall have satisfactory throttling devices so that the discharge may be reduced to 150 gpm. The pumping unit shall be complete with an ample power source, controls, and appurtenances and shall be capable of being operated without interruption for a period of 10 continuous hours.

The discharge line shall be provided with a gate valve, flow meter and suitable equipment for sand testing such as the Rossum Centrifugal Sand Sampler (refer to Journal of the American Water Works Association, Vol. 46, No. 2, February 1954). Pumping shall be performed intermittently; periods of pumping the well for approximately 10 to 15 minutes, followed by periods of approximately 2 to 5 minutes during which no pumping will occur. The maximum discharge rate attainable without breaking suction shall be maintained during development pumping, or as directed by the OTR.

Development records shall be maintained on at least a one-half-hour basis showing production rate, pumping level, drawdown, sand production, and all other pertinent information concerning well development. Development pumping shall continue until the following conditions have been met, or as directed by the OTR:

- 1) There shall be no settlement of the gravel pack.
- 2) The specific capacity (gallons per minute per foot of drawdown) shall have reached a relatively constant value over a period of at least 2 hours.

3) Sand content is no greater than 5 ppm measured 5 minutes after surging.

Approximately 20 hours of pumping development time is anticipated.

SECTION 210-3 - MEASUREMENT AND PAYMENT

Payment for well development, including airlifting, bailing, and pumping, will be made on an hourly basis. Such payment shall be considered as full compensation for furnishing all labor, materials, tools, and equipment necessary and incidental to completion of this task.

Payment for installation of all pumping equipment and connections to the District-provided discharge pipe for development and testing shall be included in the lump sum price paid for Mobilization, Section 200-2.