

GOLDEN STATE WATER COMPANY

Fairhaven Well #3

Well Drilling and Development

Ken Vecchiarelli

Orange County General Manager

September 2018



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GSWC'S ORANGE COUNTY DISTRICT

Part of GSWC Region III

- 43,300 customers
- 2 customer service areas
- 4 water systems

Facilities include:

- 30 wells
- 17 reservoirs
- 6 MWD connections

Water supply = 26,000 AF/year

- 75% groundwater
- 25% purchased water from MWD



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COWAN HEIGHTS SYSTEM



Serves a portion of the City of Orange, as well as the unincorporated areas of Cowan Heights and Lemon Heights

- 2 wells provide 50% of total water supply
- 2,750 service connections



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COWAN HEIGHTS SYSTEM IMPROVEMENTS



Service Improvement Projects

- SCADA upgrades
- Pipeline replacements
- Large reservoir roof replacement
- Re-coating 2 reservoirs
- Replacement well
- Electrical system upgrades



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COWAN HEIGHTS SYSTEM IMPROVEMENTS



Benefits to Customers and the Community

- **Distribution improvements**
 - Improved fire flows
 - System pressure
 - Water quality
- **Increased reliability**
 - Electrical upgrades
 - SCADA control



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FAIRHAVEN WELL #3



Benefits to Customers and the Community

- Replacement well
 - Less expensive water source
 - Reduced reliability on imported supplies
 - Increased use of local resources

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FAIRHAVEN WELL #3

Located on south side of Fairhaven Avenue:

- West of 55 Freeway
- East of Ponderosa Drive
- North of Calvo Drive



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Well Drilling & Development Process



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MOBILIZATION AND SITE PREPARATION

Site Preparation

- Crews, trucks, cranes, and drilling equipment will mobilize to the site and set up
- Construction access from Fairhaven Avenue
- Sound abatement equipment will be erected

Normal working hours:

7 am-5 pm, Monday through Friday

Construction Schedule:

Normal working hours for 10-15 days



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SITE PREPARATION



Installation of sound curtains

- Sound attenuation curtains will be erected to mitigate sound disturbance and reduce inconvenience to customers

Normal working hours:

7 am-5 pm, Monday through Friday

Construction Schedule:

Normal working hours for 2-3 days



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Drilling Operations



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WELL DRILLING PROCESS

Drilling Pilot Hole

- 24-hour drilling operations will begin
- Initial drilling of well to approximately 1,000 feet
- Large compressor, 50-foot drilling rig, lighting with shield on top of rig
- Formations will be excavated and stored in settling tank
- Disposal of material using backhoe and trucks
- **Construction Schedule:** 24-hour drilling operations for 5 to 7 days



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WELL DRILLING PROCESS

Analysis of Formation Cuttings and Geophysical Logging

- Offsite analysis of formation cuttings
- Various types of downhole electrical and geophysical logging will be conducted to determine quality and productivity of water bearing formations
- **Construction Schedule:** Dependent on completion of pilot hole



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WELL DRILLING PROCESS



Specific Zone Sampling

- Drilling rig used to set submersible pump
- Water is then pumped from each water bearing zone to analyze water quality
- **Construction Schedule:**
24-hour operation for 7-9 days



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WELL DRILLING PROCESS



Reaming Pilot Hole

- 24-hour drilling operations will continue to widen initial pilot hole to final depth
- Disposal of material using backhoe and trucks will continue
- **Construction Schedule:** 24-hour drilling operations for several days



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DRILLING OPERATIONS



Installation of Steel Well Casing and Gravel Pack

- Several truckloads of steel pipe and gravel will be delivered to site
- Pipe will be lowered into well and welded together to reach final depths
- Gravel will be introduced into the well surrounding the well casing
- Cement slurry will be placed above the gravel pack to ground surface
- **Construction Schedule:** 24-hour operation for 4-6 days (end of 24-hour drilling)

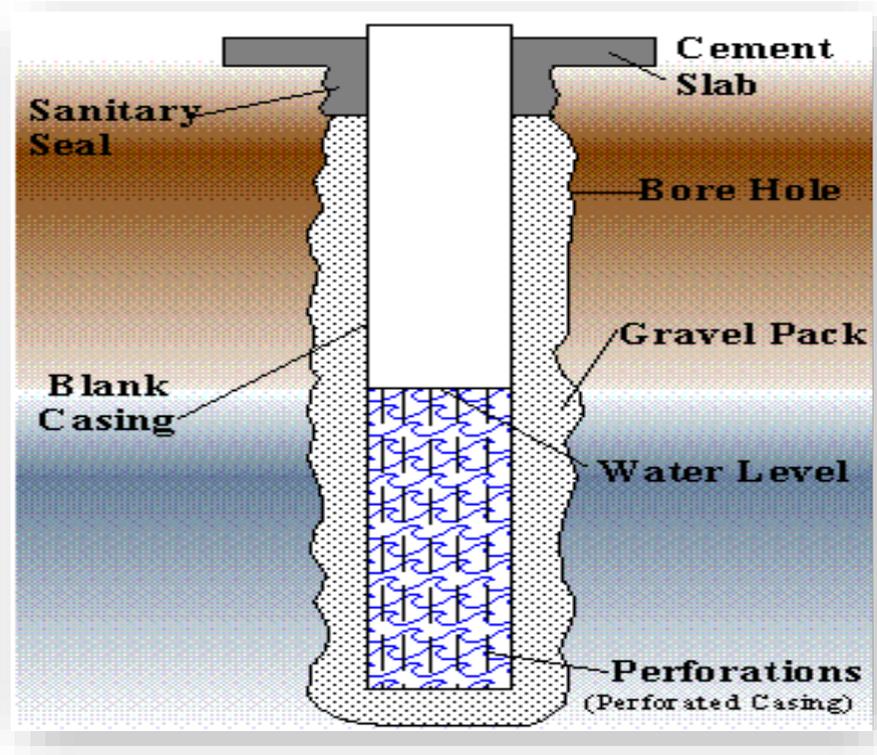


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DRILLING OPERATIONS

Cross Section of Well



Mechanical Well Development

- Drilling rig will remove fine materials from well and consolidate the gravel pack
- Water and materials removed from well will be treated and disposed per discharge requirements
- **Construction Schedule:**
Normal working hours for 5-7 days

WELL DEVELOPMENT

Final Development with Test Pumping

- Vertical test pump operated by diesel engine will be installed on site
- System of temporary surface pipe will be installed to transport pumped liquids into proper receiving system per discharge requirements
- **Construction Schedule:** Normal working hours for 10-14 days



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DRILLING OPERATIONS - DEMOBILIZATION

Site Cleanup and Final Demobilization

- Drilling and development phases completed
- Large storage tanks emptied, cleaned and removed
- Sound abatement equipment disassembled and removed
- Well disinfected and capped
- Site cleanup and restoration
- **Construction Schedule:** Normal working hours for 3-5 days



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EQUIPPING THE WELL



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WELL EQUIPMENT INSTALLATION

Equipping the Well

- Vertical turbine pump, electrical motor installed
- On-site piping and buildings constructed
- **Construction Schedule:** Normal working hours for 6-8 weeks



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ON-SITE BUILDINGS AND PIPING



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ON-SITE BUILDINGS AND PIPING



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Post-Construction



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POST-CONSTRUCTION OPERATIONS

Normal Operations

- Electric motor and discharge piping housed in roll-away insulated building
- Liquid sodium hypochlorite vessel with self containment tank, alarms and disinfection equipment in separate building
- Water supply technicians visit site once a day for 15-30 minutes
- Routine maintenance may require pump rig with 20 foot mast to pull pump and treat well
- Well treatments once per year for 2-3 weeks



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POST-CONSTRUCTION

Daily Operations



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Additional Information



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ADDITIONAL INFORMATION

Community Outreach Plan

- Direct mailers to surrounding residents
 - Description of project
 - Construction schedule
 - Company contacts
- Status Reports Posted on GSWC web site



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ADDITIONAL INFORMATION

Project Schedule

- Phase 1 - Drill & Develop Well 90 days October-December 2018
- Phase 2 - Equip Well TBD Stay Tuned, 2019-2020



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CONTACT INFORMATION

Contacts

- 24-Hour Customer Service 800-999-4033
- David Eikamp, Water Supply Superintendent 714-528-8010 x306
- Del Webb, Placentia CSA Superintendent 714-528-1463 x101
- Stan Yarbrough, OC District Engineer 714-535-8010 x320
- Ken Vecchiarelli, OC District GM 714-535-8010 x300

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