

# WELCOME

#### From Source to Tap SJW System Operations Overview

APRIL 13, 2022



Carlos Ramos Operations Superintendent



**Richard Tapia** Operations Superintendent



- Welcome
- What is Operations?
- System Overview
- Sources of Supply
- SCADA System
- Water Distribution
- Pump Stations
- Water Quality Management
- Energy-Efficient Pumping
- Emergency Response

#### What is Operations?

- 24/7 Operation
- We wear many hats
  - Distribution System
  - Watershed
  - Water Quality
  - Energy Management

- Operations Group
  - System Operators
  - Electrical Group
  - Crews

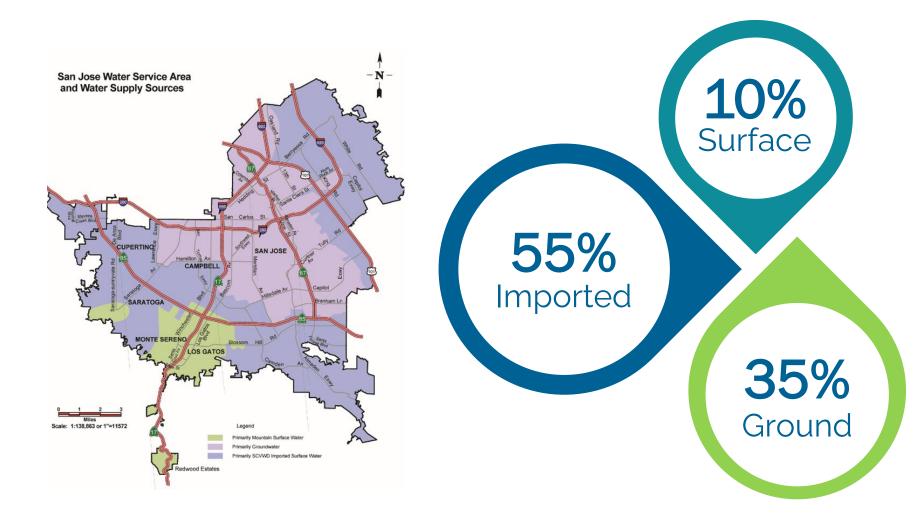








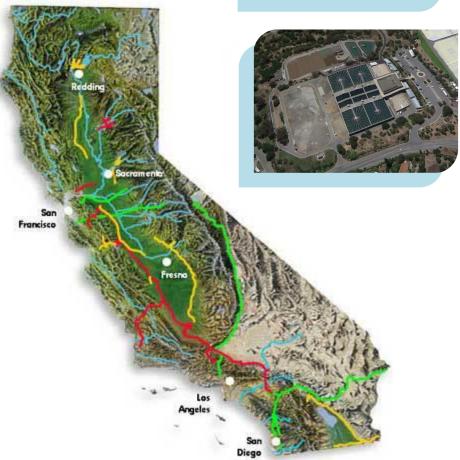
#### SJW Source of Supply





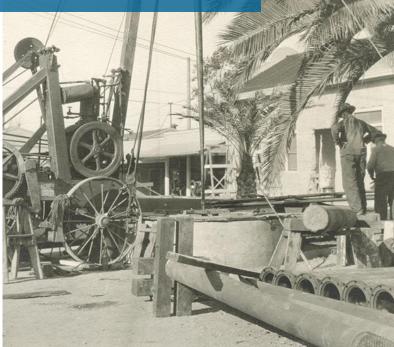
#### Imported Water

- Valley Water District formed in 1968
- Water wholesaler for the Santa Clara Valley region
- Flood protection agency, stewardship over local streams, creeks, groundwater basins
- Operates 10 local raw water reservoirs





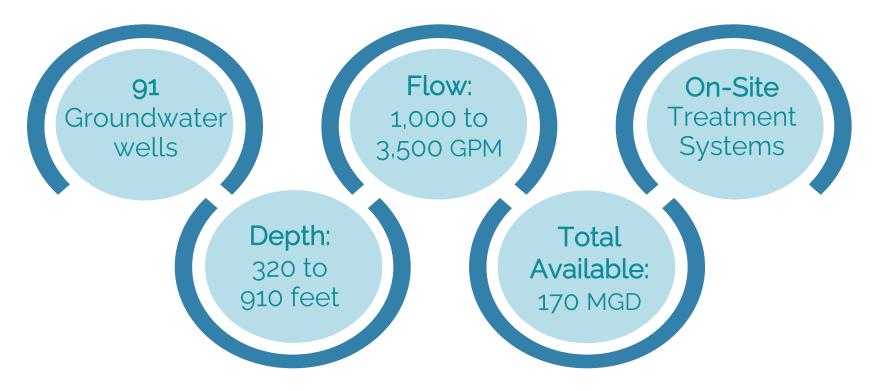
#### Groundwater Digging for Water







#### Groundwater



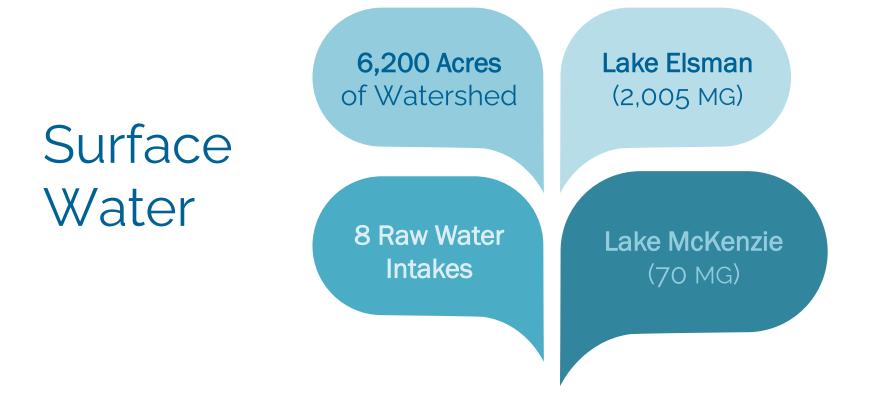


#### Local Surface Supplies











#### Surface Water Filtration Plants

- Montevina Filter Plant (Los Gatos, 30 MGD)
- Saratoga Filter Plant (Saratoga, 5 MGD)
- Howell Filter Plant (Los Gatos, 14k GPD)



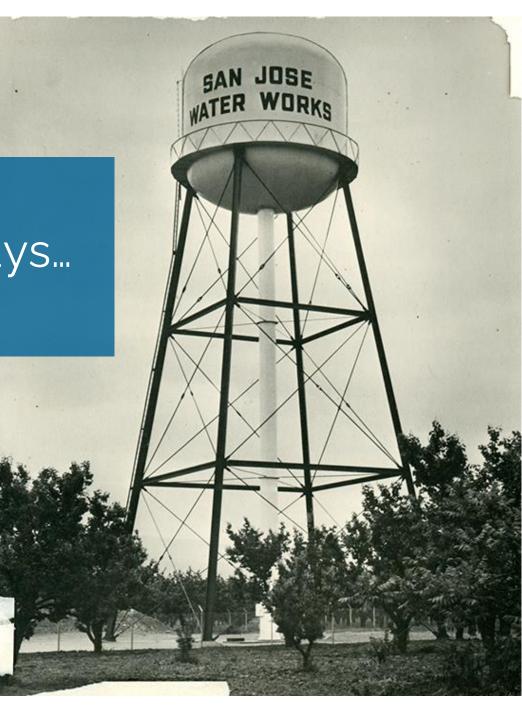






#### Back in the Old Days...





#### SCADA System

(Supervisory Control and Data Acquisition)

- Leading U.S. urban water management system
- Real-time monitoring & control of 105 reservoirs & 300+ pumps
- 50,000+ information points
- Real-time water quality monitoring, including hazmat & environmental compliance
- Automated energy management

|  |  |   |  |  |  |   |   |  |   |   |   |   | EASTZONES   |   |   | _   |   |   |
|--|--|---|--|--|--|---|---|--|---|---|---|---|---|---|---|---|---|---|
| ation  |  |   |  |  |  | Q101 W 30112  | -   |  |   |   |   | COLU  | WO INT 20ME   |   |   |   |   |   |
|  | Amet   | HOA   |  | Flew<br>Rate   |  | GIBIT_SIL/MELL2   | 100.1.2   | ٠  | MITE  |   | -   | Starts  |   | Amet  | BOA   | Martin  | Flow<br>Rate  |   |
| GL_COTTINE_DISTRA<br>GL_COTTINE_DISTRA         | 85119<br>85119   |   | AUTO<br>AUTO   | ***  | - <b>GPN</b>   | HOBBLIK VIELLI<br>HOBBLIK VIELLI<br>HOST, HELLIKKI  | HELD<br>HELD  | L.   |   | 0.0   | OPM   | LE ALIME  |   | 8665<br>85192   | î.  | MAX<br>HEAT   |   |   |
| GL_CERTWIC (INSTRO                             | 85783  | ^   | BOBH   | Fire   |  | DACK (HE WELL)  | NELL2<br>REGI   | ÷  | MAN   |   | -   | 19957.0   | EG, REGI  | 85780<br>REG1   | ÷   | MAS   |   |   |
| IN COTHE (SSTRE                                | 85184  |   | -  | -  |  | 1751, GHB (05182<br>3ML, GHB (05182   | 85782<br>85782  | L  | MAR   |   | CPM   | MNOT  | REG_REGH  | 1664  | ÷   | ALD:0   |   |   |
|  | 05182  | *   | 1544   |  |  | 1207_0300_005100  | -   |  | ROOM  |   | -   | 781.7   | NO.05188  | 8062<br>851181  | î.  | 005   |   |   |
| tation   |  |   |  | Filme<br>Rate  | _  |   |   |  |   |   |   | 1257.5  | W9_BSTRA  | 85786   | ŝ   | HEAR<br>HEAR  |   |   |
| INT JEG JEGZ<br>IC.,OWE.JETTE<br>IC. OWE BETER | 10.100<br>10.100   |   | NUMBER OF COLUMN   |  |  | States  |   | -  |   | Rafe  | _   | Statio  |   | Asset   | -   |   | Flow<br>Rate  |   |
| N N N NELLS                                    | 05/181   | i.  | -  |  |  | CMSR_U29TWR_B5TRD<br>CMSR_U29TWR_B5TRD  | 85192   | L.   | MAR   |   | GPM.  | COLE,   | CRIME, INVESTIG   | -   | :   | ICON<br>ICON  |   | -   |
| S_OWD_BSTRE                                    | 05110<br>05118   | A   | ECON   |  | CPM  | CMSR_325TWR_85THE   | 85784   | L  | MAH   |   |   | MILLE   | 20,05191  | 85781   |   | ECON  | 680.4   |   |
| TG_GMBR_BSTR1<br>TG_GMBR_BSTR2                 | 05181<br>05182   | L   | 005<br>005   |  |  | PLIN, STREWS, JOINT   | 85785   | ì  | ECOH<br>ECOH  | 6.0   | OPM   |   |   | esties  | -   | Allo  |   | a   |
| INCOMERCIEST<br>OF COMBUSTER<br>RCXCOMELS      | 05388  | τ.  | 005<br>NUM   |  | OPM  | FLEM, JOINTWE, BETTER<br>LINCE, JOINTWE, BETTER<br>LINCE, JOINTWE, BETTER   | BUTHA<br>BUTHA<br>BUTHA<br>BUTHA  | A<br>L<br>L  | 6006<br>005<br>005  |   | CPMI  |   |   |   |   |   |   |   |
|  |  |   |  |  |  |   |   |  |   |   |   |   |   |   |   |   |   |   |
|  |  |   |  |  |  |   |   |  |   |   |   |   |   |   |   |   |   |   |
|  | 64., URINEL, BATHO<br>1441-0<br>1441, SETURA, SOTAR<br>1441, SETURA, SOTAR<br>1441, SETURA, SOTAR<br>1441, SETURA<br>1441, SET | Comparison     Sector     Assett       Values     Assett     Sector       And Comparison     Sector     Sector       Sector     Sector     Sector <td>Application     Annuel     HOLD       Application     Application     HOLD       Application     Application     HOLD       Application     HOLD</td> <td>Approx.     Approx.     <t< td=""><td>Approx.     Bit of the sector of the</td><th>Application     Application     Application</th><td>Sector     Sector     Sector&lt;</td><td>Approx (A)(P)     Vite     A     Disk     Approx (A)(P)     Approx</td><td>Non-State     Non-State     <t< td=""><td>Second Control     Second Control     Second</td><td>Sector     Sector     Sector&lt;</td><td>Sector     Sector     Sector&lt;</td><td>Signa Hang, Diang, Di</td><td><math display="block"> \begin{array}{cccccccccccccccccccccccccccccccccccc</math></td><td><math display="block"> \begin{array}{c c c c c c c c c c c c c c c c c c c </math></td><td>Sector     Sector     A 1000     A 10000     A 10000     A 100</td><td>Section     Section     <t< td=""><td>Description     Description     Description</td></t<></td></t<></td></t<></td> | Application     Annuel     HOLD       Application     Application     HOLD       Application     Application     HOLD       Application     HOLD | Approx.     Approx. <t< td=""><td>Approx.     Bit of the sector of the</td><th>Application     Application     Application</th><td>Sector     Sector     Sector&lt;</td><td>Approx (A)(P)     Vite     A     Disk     Approx (A)(P)     Approx</td><td>Non-State     Non-State     <t< td=""><td>Second Control     Second Control     Second</td><td>Sector     Sector     Sector&lt;</td><td>Sector     Sector     Sector&lt;</td><td>Signa Hang, Diang, Di</td><td><math display="block"> \begin{array}{cccccccccccccccccccccccccccccccccccc</math></td><td><math display="block"> \begin{array}{c c c c c c c c c c c c c c c c c c c </math></td><td>Sector     Sector     A 1000     A 10000     A 10000     A 100</td><td>Section     Section     <t< td=""><td>Description     Description     Description</td></t<></td></t<></td></t<> | Approx.     Bit of the sector of the | Application     Application | Sector     Sector< | Approx (A)(P)     Vite     A     Disk     Approx (A)(P)     Approx | Non-State     Non-State <t< td=""><td>Second Control     Second Control     Second</td><td>Sector     Sector     Sector&lt;</td><td>Sector     Sector     Sector&lt;</td><td>Signa Hang, Diang, Di</td><td><math display="block"> \begin{array}{cccccccccccccccccccccccccccccccccccc</math></td><td><math display="block"> \begin{array}{c c c c c c c c c c c c c c c c c c c </math></td><td>Sector     Sector     A 1000     A 10000     A 10000     A 100</td><td>Section     Section     <t< td=""><td>Description     Description     Description</td></t<></td></t<> | Second Control     Second | Sector     Sector< | Sector     Sector< | Signa Hang, Diang, Di | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | Sector     Sector     A 1000     A 10000     A 10000     A 100 | Section     Section <t< td=""><td>Description     Description     Description</td></t<> | Description     Description |







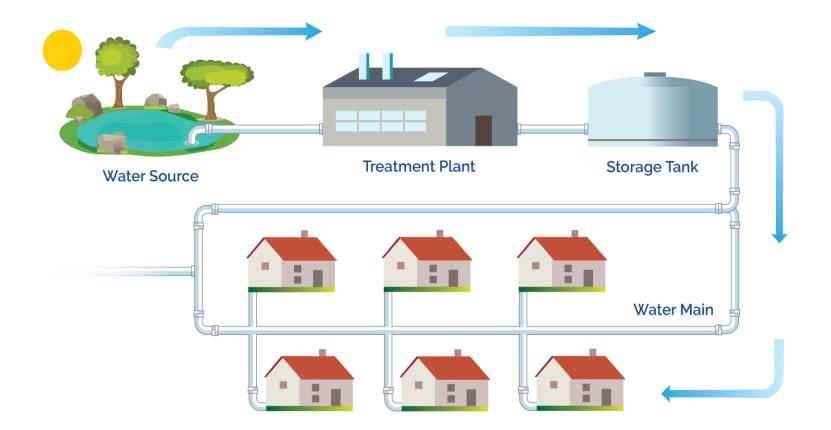


#### Behind the Scenes

- 28-member Operations team oversees 140 sq miles of infrastructure including 300+ wells and boosters, 105 reservoirs, and 100 pressure zones
- 24/7 monitoring with 99.9% reliability

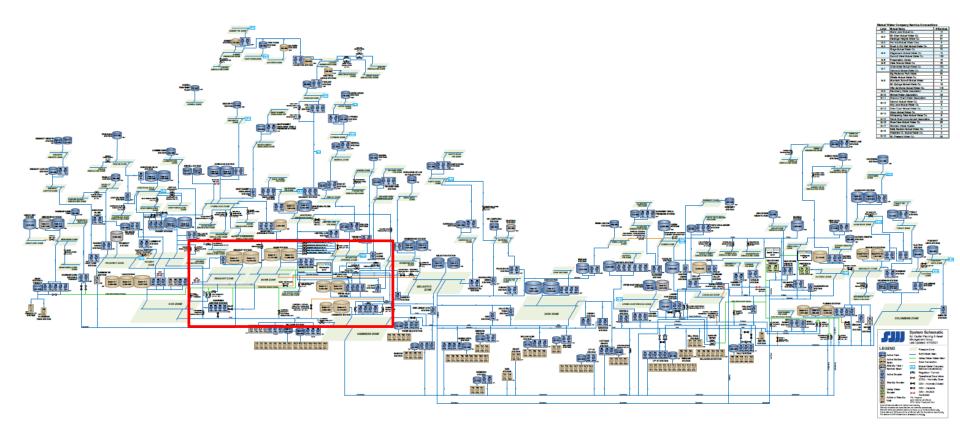


#### Water Distribution System



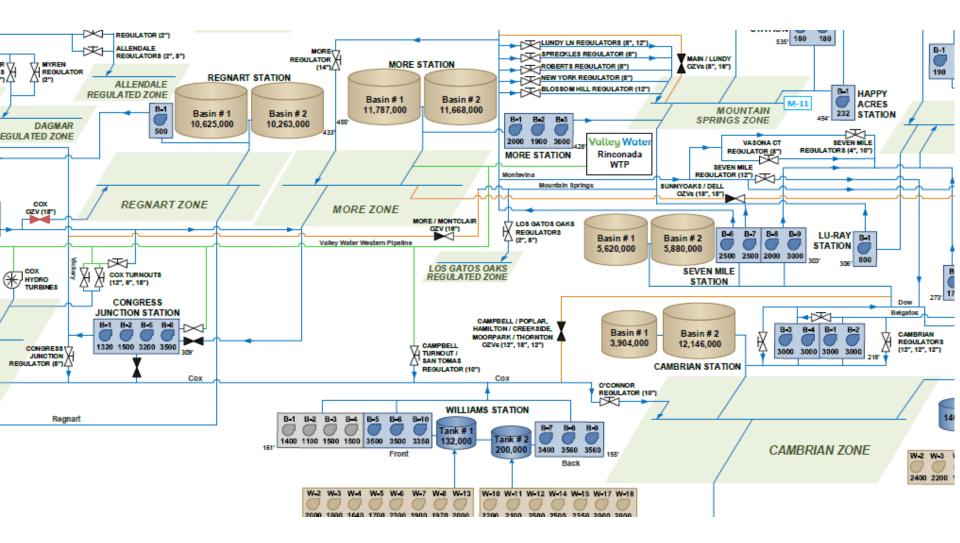


#### SJW's Water Distribution





#### SJW's Water Distribution







#### Operation Stations

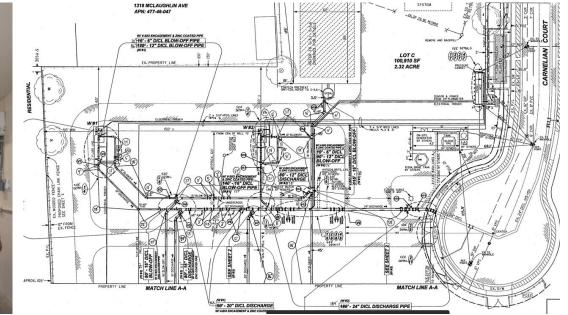
## 190+ stations provide supply and move water through the system















# Operation Stations (cont'd)

- Pressure Systems
- Regulators
- Intakes & Turnouts



#### Water Quality Management

- <u>Goal</u>: keep water as natural as possible, while maintaining the highest water quality
- Minimizing reservoir "water age" reduces chemical use
- SCADA enables 24/7 quality monitoring & real-time intervention
- Disinfectant isolation & residual monitoring keeps water safe



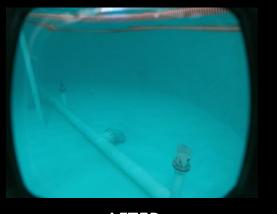








BEFORE



AFTER

Water Quality Management (cont'd)

- Scheduled tank inspections & cleaning minimize microbial growth
- Remote operated vehicle program increases efficiency and cuts costs







# Water Quality Management (cont'd) CHLORINE GENERATION SYSTEMS



#### Asset Management

- Careful planning keeps our 157year-old system state-of-the-art
- Operations optimizes the useful life of 6,000+ useful assets through 12,000 ongoing preventative maintenance tasks
- Enterprise Asset Management (EAM) system reduces costs















|   |             |                      |               |       | < =                          |
|---|-------------|----------------------|---------------|-------|------------------------------|
| Twelfth St. Station                     |             |                      |               |       | Filter: Tage *               |
| Twelfth St. Station                     |             |                      |               |       | Filler. Tage *               |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
| Booster OPE                             |             | 23% 0% 0% 0% 0%      | Well OPC      |       | 051 051 051                  |
| -                                       |             |                      |               |       |                              |
| -                                       |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
| 1000000 100 av 100 av                   | 3 (1) of 1  |                      | 100000 100.44 |       |                              |
|   |             |                      |               |       |                              |
| Booster Flow                            |             | 4452 GPH 4 GPH 0 GPH | Well Flow (1) |       | 0.0PM 0.0PM 2.0PM            |
| _                                       |             |                      | -             |       | -                            |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
| -                                       |             |                      | -             |       |                              |
| 100 100 100 100 100 100 100 100 100 100 | 10.00 10.00 | 10.00 10.00          |               | 10100 | 1 00 FF                      |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
| Booster Discharge Pressure              |             | 58 P81 84 P81 85 P81 | Well Flow (2) | 19    | TO GPH 0 GPH 0 GPH 0 GPH - C |
| -                                       |             |                      | -             |       |                              |
|   | -           |                      | -             |       |                              |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |
|   |             |                      |               |       |                              |

### Energy-efficient Pumping

- IOT technology monitors pumping efficiency in real-time
- Reducing energy costs is good for the environment and our customers
- SCADA integration optimizes energy use with "time-of-use factoring" pumping strategy









Emergency Response

- Always ready to respond
- PSPS Events
- Natural Disasters
- Import Supplier Shutdowns
- Pandemics
- Emergency Partnerships



### Questions?

### Thank You!

PLEASE complete the survey when you exit the webinar for a chance to win a **Starbucks gift card**.