2012 INTERNATIONAL FIRE CODE

507.5.2 Inspection, testing and maintenance. Fire hydrant systems shall be subject to periodic tests as required by the *fire code official*. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, *alterations* and servicing shall comply with *approved* standards.

507.5.3 Private fire service mains and water tanks. Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 at the following intervals:
1. Private fire hydrants (all types): Inspection annually and after each operation; flow test and maintenance annually.
2. Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
3. Fire service main piping strainers: Inspection and maintenance after each use.

507.2.1 Private fire service mains. Private fire service mains and appurtenances shall be installed in accordance with NFPA 24.
507.2.2 Water tanks. Water tanks for private fire protection shall be installed in accordance with NFPA 22.
507.3 Fire flow. Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an *approved* method.
507.4 Water supply test. The *fire code official* shall be notified prior to the water supply test. Water supply tests shall be witnessed by the *fire code official* or *approved* documentation of the test shall be provided to the *fire code official* prior to final approval of the water supply system.
507.5 Fire hydrant systems. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6.
507.5.1 Where required. Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an *approved* route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the *fire code official*.

E·J Flow Tests

FLOW TESTING SERVICES

Flow Test Summary

EJ Flow Tests Project Name:	Province Parcel 3
EJ Flow Tests Project No.:	16034
Project Address:	West Smith Enke Road & Province Parkway, Maricopa, AZ 85138
Date of Flow Test:	February 10, 2016
Time of Flow Test:	10:45 AM
Data is Current and Reliable Until:	August 10, 2016

Raw Test Data:

Static Pressure: (measured in pounds per square inch)	71.0 psi
Residual Pressure: (measured in pounds per square inch)	66.0 psi
Pitot Pressure: (measured in pounds per square inch)	30.0 psi
Number of Outlets Flowed:	2
Fire Hydrant Orifice Diameter: (measured in inches)	2.5 inches
Coefficient of Discharge: (0.9 smooth/round outlet, 0.8 square/sharp outlet, 0.7 square/raised outlet)	0.9
Flowing GPM: (measured in gallons per minute)	1,839
GPM at 20 PSI:	6,444

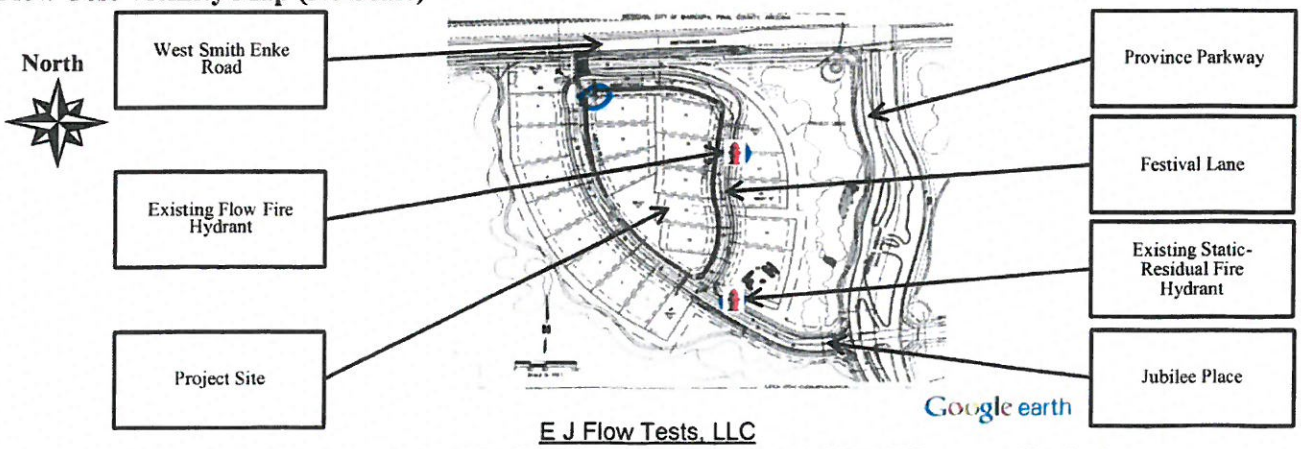
Data with minimum safety factor of: 10% :

Static Pressure: (measured in pounds per square inch)	63.9 psi
Residual Pressure: (measured in pounds per square inch)	58.9 psi
Main Size: (measured in inches)	Not provided
Approximate Distance Between Hydrants: (measured in feet)	365 ft
Approx. Static/Residual Hydrant Elevation: (measured above sea level)	1,168 ft
Approx. Flow Hydrant Elevation: (measured above sea level)	1,166 ft
Flowing GPM: (measured in gallons per minute)	1,839
GPM at 20 PSI:	5,943

Conducted by/Witnessed by/City Forces Contacted:

Conducted by:	Austin Gourley & Eder Cueva (EJ Flow Tests) 602.999.7637
Witnessed by:	Eddie R. (COM FM) 520.251.0024, Joe B. (GW) 480.560.5702 & Ken O. (Land Mgmt.) 480.213.5426
City Forces Contacted:	City of Maricopa Fire Department (520.251.0024) & Global Water (480.560.5702)

Flow Test Vicinity Map (No Scale)



E J Flow Tests, LLC
21505 North 78th Ave. • Suite 125 • Peoria, Arizona 85382 • 602.999.7637 • www.ejflowtests.com
John L. Echeverri • NICET Level IV 078493 SME • C-16 FP Contractor ROC 271705 AZ • NFPA CFPS 1915

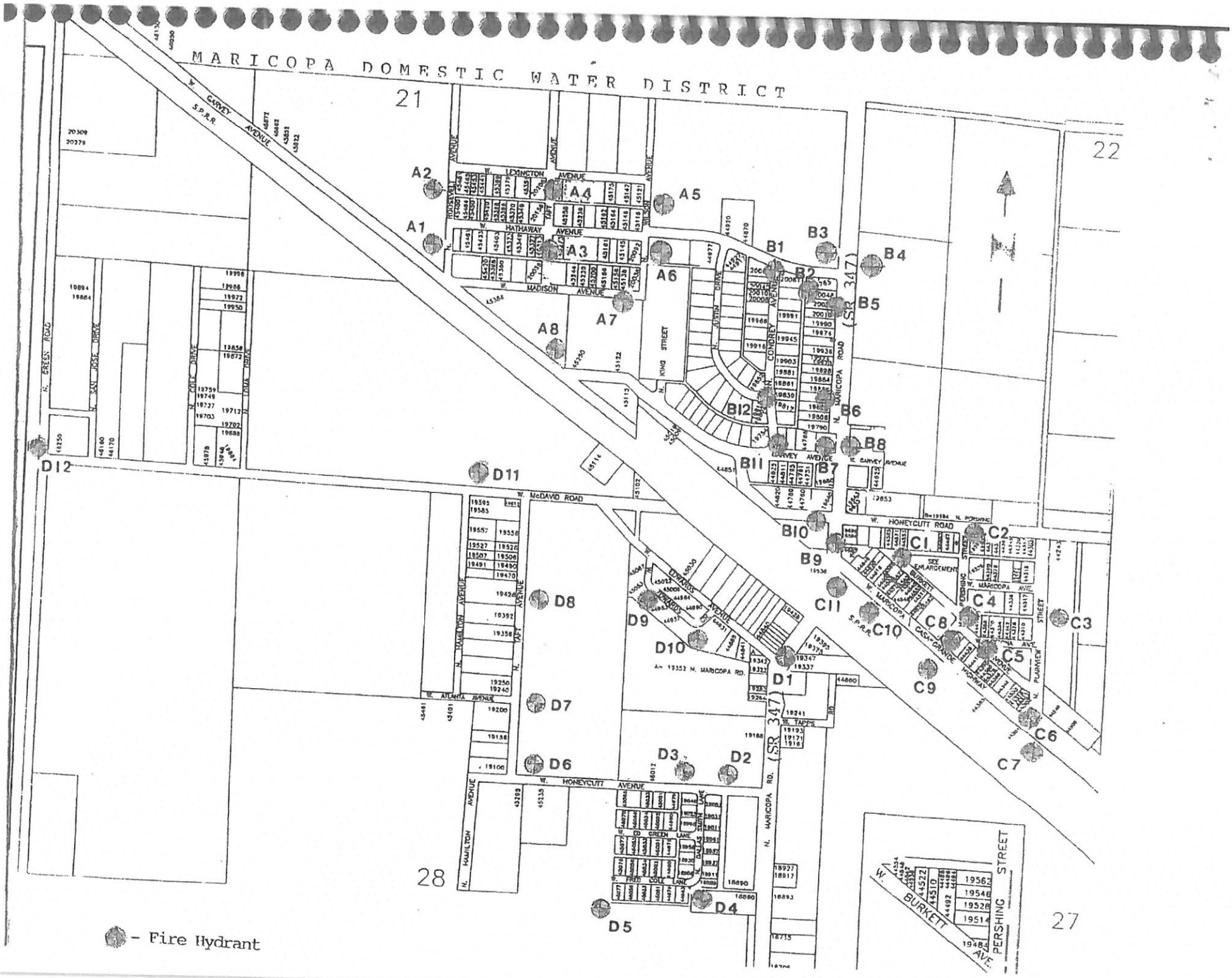
Image Courtesy of Google Earth

FLOW TEST SUMMARY REPORT

LOCATION: Culvers Maricopa
24030 N John Wayne Parkway

DATE: 09-07-16
TIME: 8:50

Static Hydrant Number:	1	Flowing Hydrant Number:	2
Elevation:	1	Elevation:	1
Dist. Between Hydrants:	200		
Diameter of Main:	8		
Outlet Diameter:	4.00 in	Number flowing: 1 Coeff.:	0.90
Static pressure:	61.00 psi	Residual pressure:	58.00 psi
Pitot Reading:	18.00 psi	Flow:	1823.0 gpm
Flow at 20 psi:	7492.5 gpm		


MARICOPA DOMESTIC WATER DISTRICT
21
22
28
27
W. CARVEY AVENUE
S.P.R.R.
W. LEXINGTON AVENUE
W. HATHAWAY AVENUE
W. MADISON AVENUE
N. KING STREET
N. AUSTIN DRIVE
N. CONDREY AVENUE
N. MARICOPA ROAD (SR 347)
W. CARVEY AVENUE
W. McDAVID ROAD
W. HONEYCUTT ROAD
N. PERSHING STREET
W. MARICOPA AVENUE
N. CASA GRANDE HIGHWAY
N. PLAINVIEW AVENUE
W. TAPPS
W. ATLANTA AVENUE
N. HAMILTON AVENUE
W. HONEYCUTT AVENUE
W. ED GREEN LANE
W. FRED COOK LANE
N. DALLAS DRIVE
N. MARICOPA RD. (SR 347)
W. BURKETT AVENUE
N. CREEK ROAD
N. EAST JOSE DRIVE
N. GOLF DRIVE
A1
A2
A3
A4
A5
A6
A7
A8
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
B11
B12
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
D1
D2
D3
D4
D5
D6
D7
D8
D9
D10
D11
D12
- Fire Hydrant

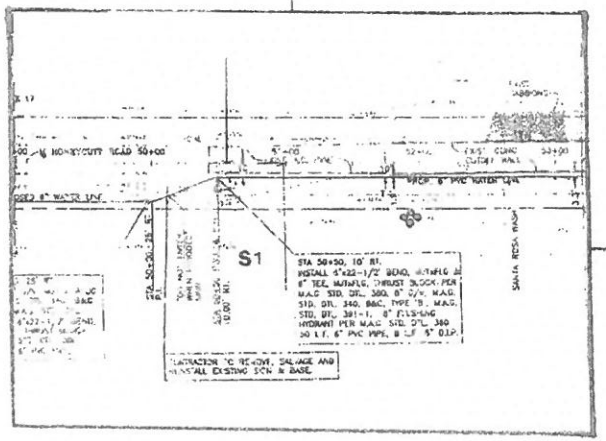

A1-N Roosevelt/Hathaway Ave
A2- N Roosevelt/Lexington Ave
A3- N Taft/Hathaway Ave
A4-N Taft/Lexington Ave
A5- N Wilson/Lexington Ave
A6- N Wilson/Hathaway Ave
A7- W Madison/Wilson Ave
A8-45268 W Garvey
B1-Hathaway/Condrey Ave
B2-SR347/Hathaway Ave
B3- NW Corner Hathaway/SR347
B4-NE Hathaway Ave/SR347
B5-20054 N SR347
B6-19864 N SR347
B7-19756 N SR347
B8-44624 W Garvey Ave
B9-19595 N SR347
B10-44801 W Honeycutt Rd
B11-19754 N Condrey
B12-19852 N Justin Ave
C1-44554 W Burkett
C2-44405 W Honeycutt Rd
C3-N Plainview/W Maricopa Ave
C4-Pershing/Burkett St
C5-Arizona/Burkett Ave
C6-Plainview St/W CG Hwy
C7-44301 W CG/Maricopa Hwy
C8-Pershing/W CG Hwy
C9-W CG-Maricopa Hwy/S Side
C10-W CG-Maricopa Hwy/S Side
C11-W CG-Maricopa Hwy/S Side
D1 19347 N SR347
D2-45012 W Honeycutt Ave
D3-45012 W Honeycutt Ave
D4-44953 W Fred Cole Ln
D5-Alley-45077 W Fred Cole Ln
D6-19100 N Taft Ave
D7 19200 N Taft Ave
D8-19428 N Taft Ave
D9-45022 W Edwards Cir
D10-44945 W Edwards Cir
D11-W McDavid/Hamilton Rd
D12-46250 W McDavid Rd
D13-46170 W McDavid Rd

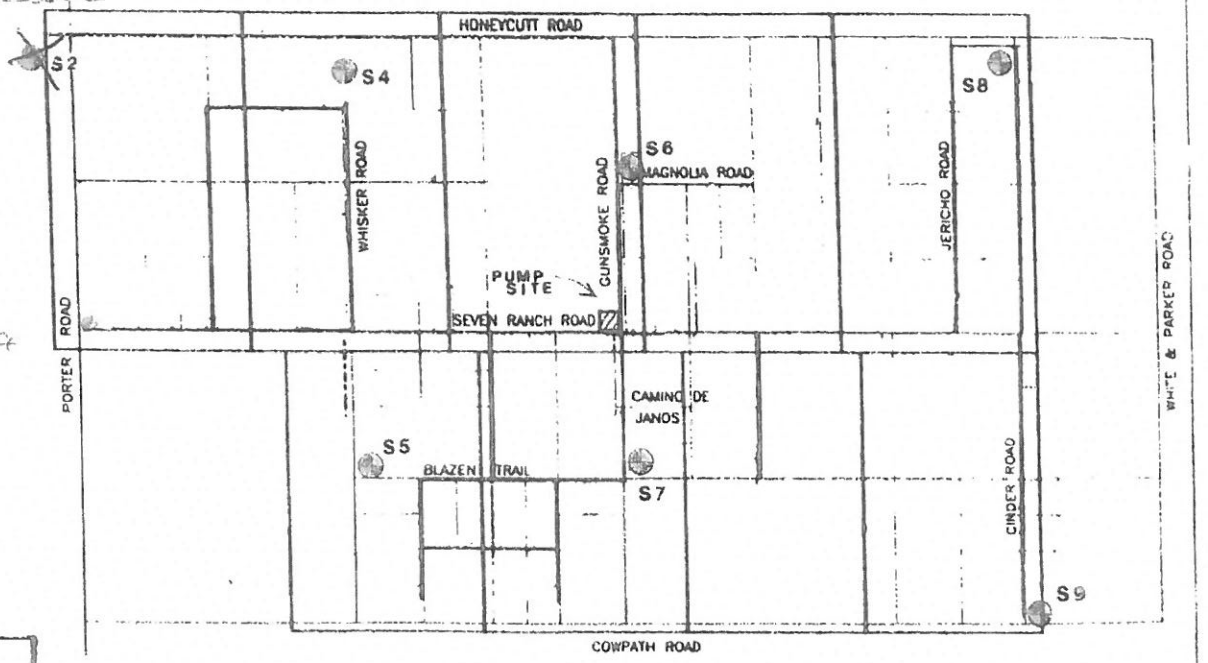
7 Ranches Domestic Water Improvement District
Fire Hydrant Locations

S1-Honeycutt **Rd**/Santa Cruz Wash
(See Insert)
S2-Honeycutt **Rd**/Porter Rd – Not easily accessible

S4-Whisker Rd/S of Honeycutt **Rd**
S5-Whisker Rd/Blazen Trail
S6-Gunsmoke Rd/Magnolia Rd
S7-Gunsmoke Rd/Blazen Trail
S8-Honeycutt Rd/Cinder Rd
S9-Cinder Rd/Cowpath Rd

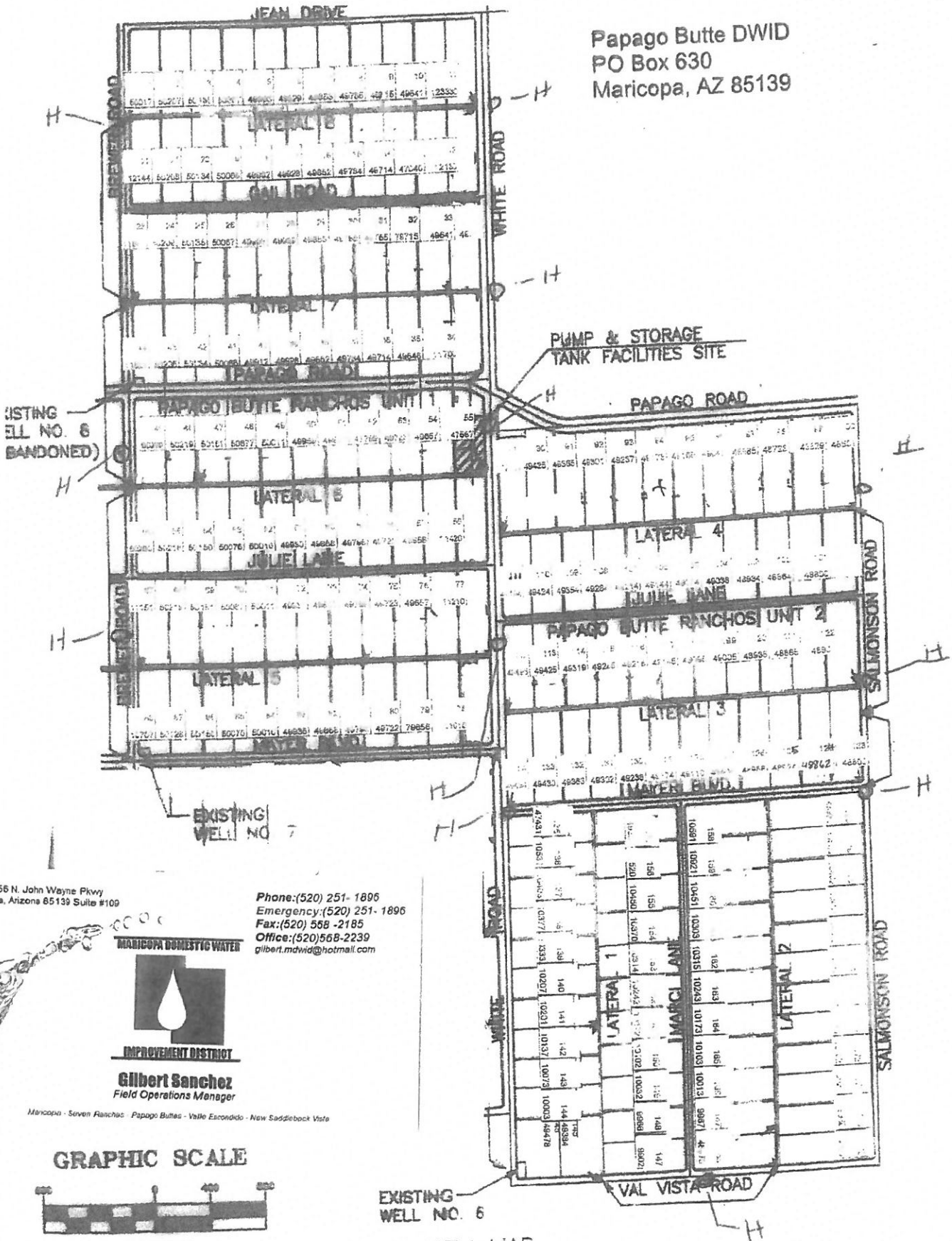
THE N1/2 OF SEC. 25, T.4S., R.3E., G.&S.R.M.





Blow off only

- FIRE HYDRANT



Papago Butte DWID
PO Box 630
Maricopa, AZ 85139

19755 N. John Wayne Pkwy
Maricopa, Arizona 85139 Suite #109

Phone:(520) 251- 1895
Emergency:(520) 251- 1896
Fax:(520) 568 -2185
Office:(520)568-2239
gilbert.mdwid@hotmail.com

MARICOPA DOMESTIC WATER
IMPROVEMENT DISTRICT

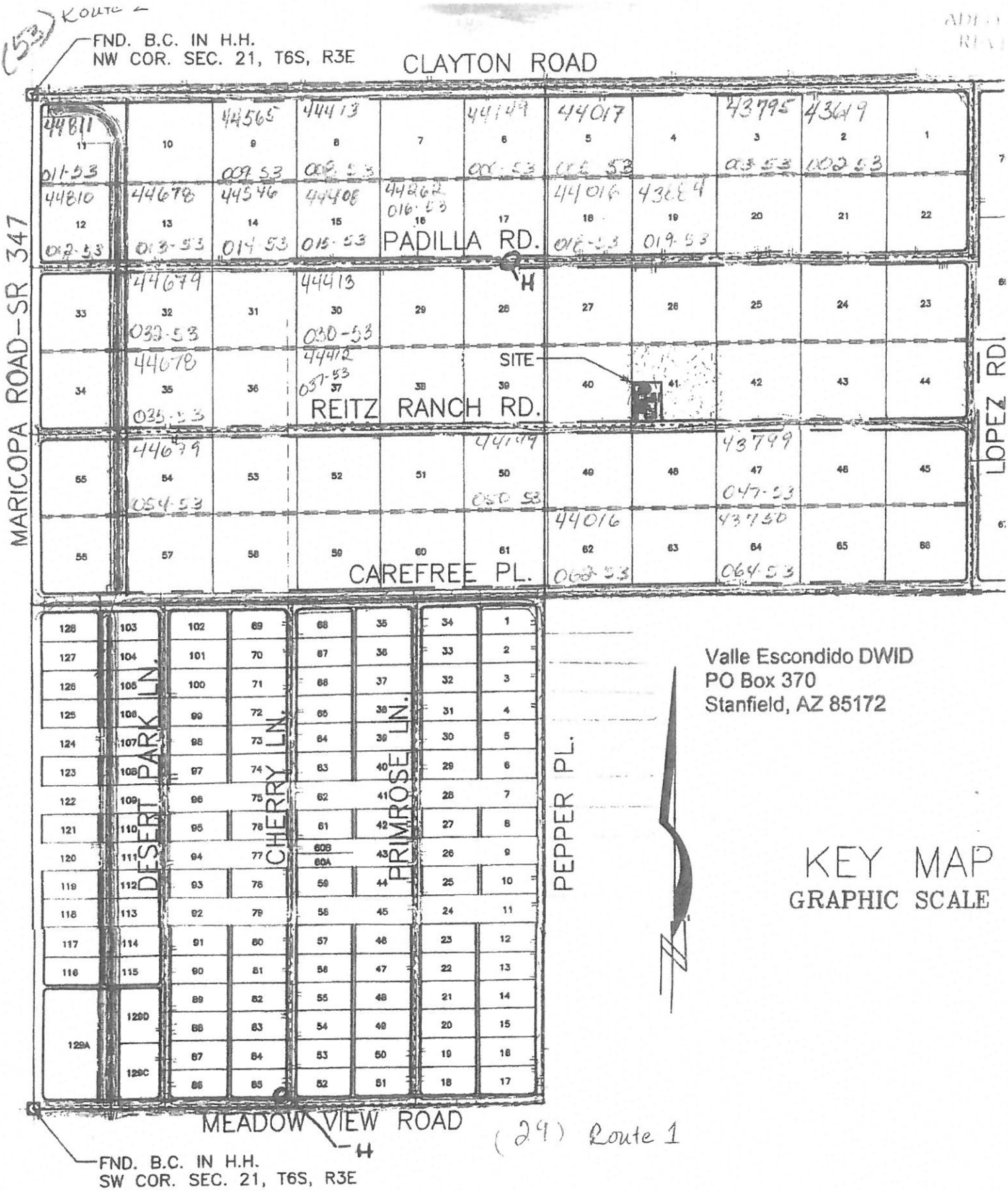
Gilbert Sanchez
Field Operations Manager

Maricopa - Seven Ranches - Papago Buttes - Valle Escondido - New Saddleback Vista

GRAPHIC SCALE

400 0 400 800

(IN FEET)
1 inch = 800 ft.


(53) Route 2
FND. B.C. IN H.H.
NW COR. SEC. 21, T6S, R3E
CLAYTON ROAD
MARICOPA ROAD–SR 347
LOPEZ RD
PADILLA RD.
REITZ RANCH RD.
CAREFREE PL.
SITE
DESERT PARK LN.
CHERRY LN.
PRIMROSE LN.
PEPPER PL.
MEADOW VIEW ROAD
FND. B.C. IN H.H.
SW COR. SEC. 21, T6S, R3E
(29) Route 1
Valle Escondido DWID
PO Box 370
Stanfield, AZ 85172
KEY MAP
GRAPHIC SCALE

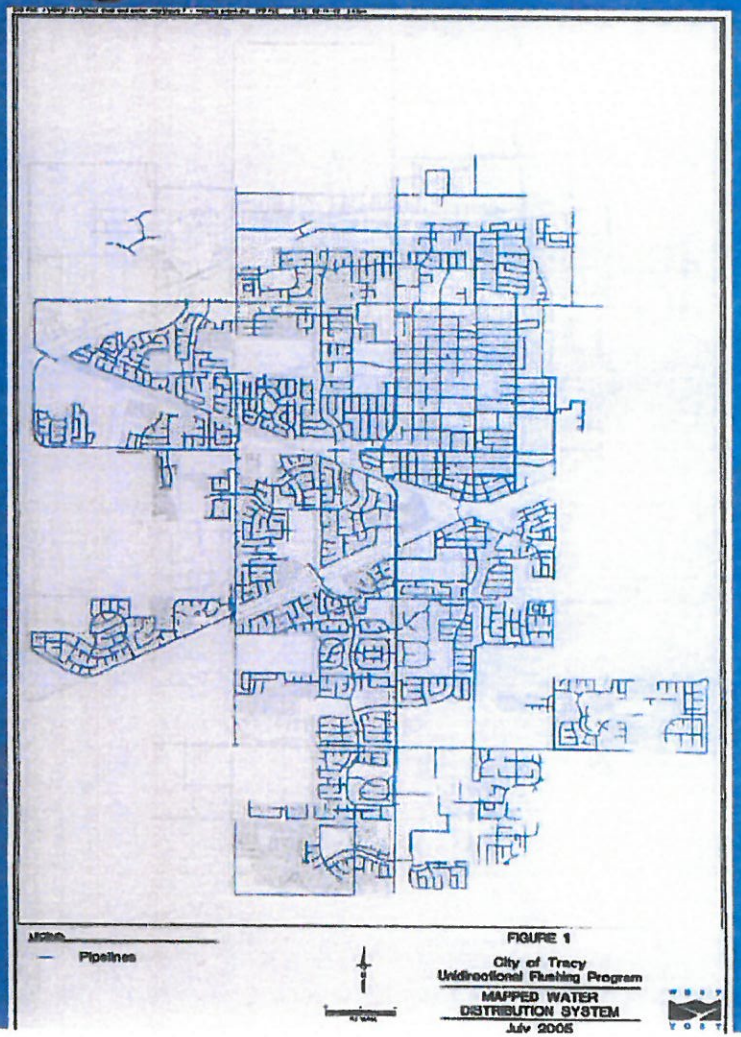
Program Elements

1. Review System Maps and Hydraulic Model
2. Develop Optimized Flushing Program
3. Develop Field Crew Mapbooks
4. Pilot Test Worse Case Areas
5. Develop Implementation Program

1. Developed Map of System for UDF Program

Not the Entire System

Worked with O&M Staff to Verify Locations for Hydrants, Valves, and Blow-offs



1. Developed Seasonal Diurnal Curves

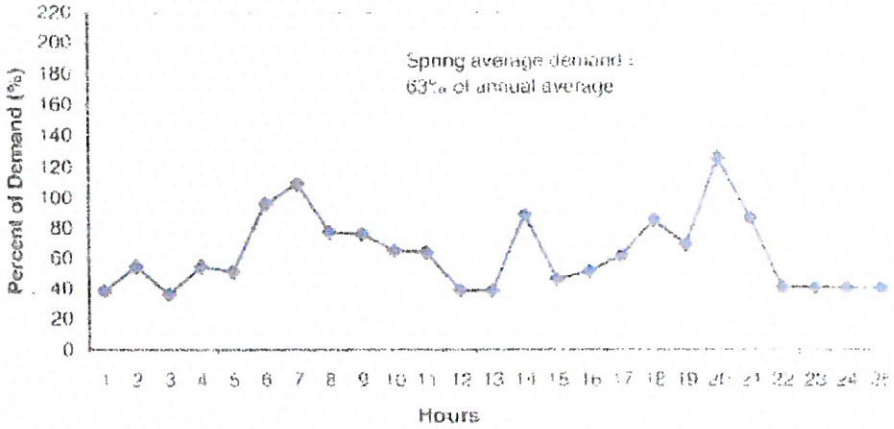
Normal Flow Paths and Direction of Water Movement in System Under Typical Seasonal Demands

Puts the "Uni" in Unidirectional flushing

Fall Diurnal

Summer Diurnal

Spring Diurnal

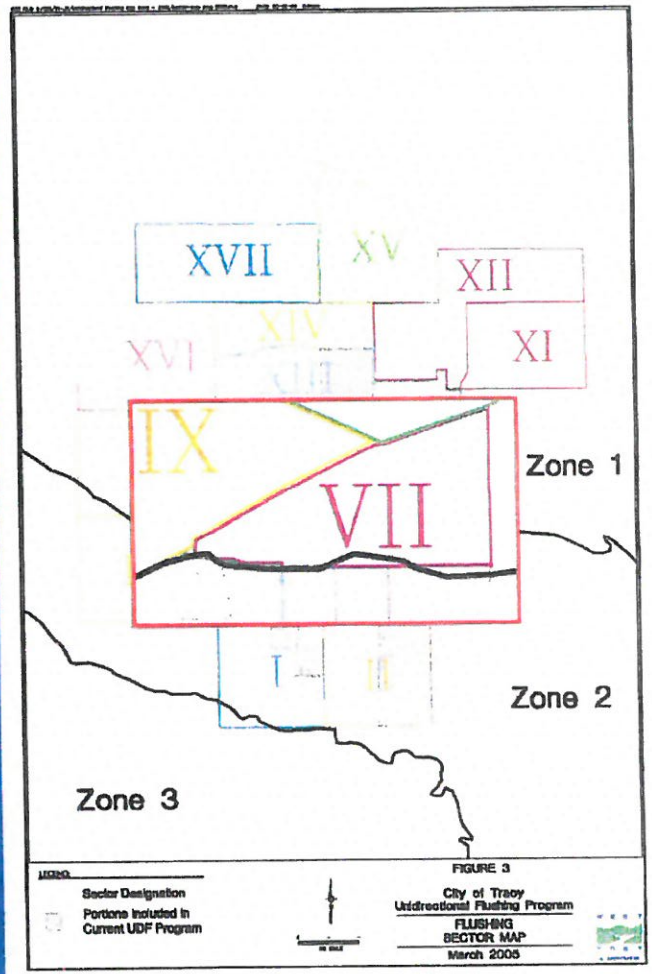


2.

Optimized Program

1. Divide System into Sectors

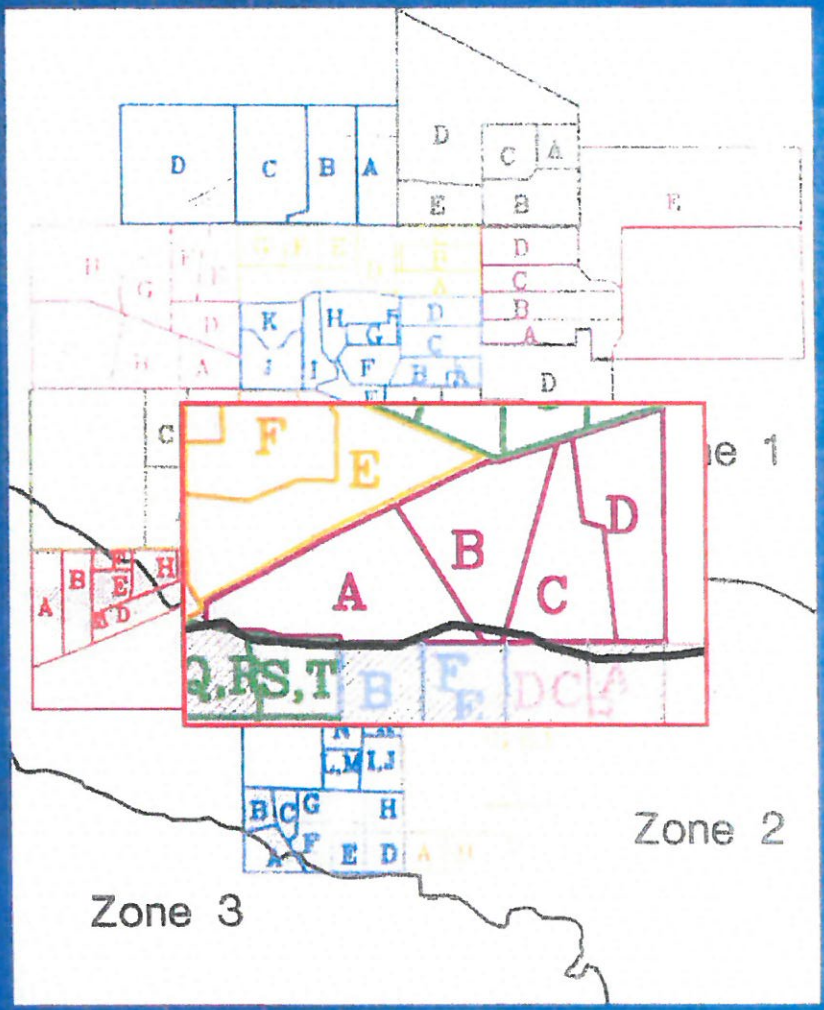
- Sequenced to moving water from clean to dirty areas
- Configured for a minimum velocity of 6 feet per second
- Configured to maintain minimum pressure for basic service and fire flows (30 psi)
- Loops sized for completion by flushing crew in 1 day



Optimized Program

2. Divide Sectors into Loops

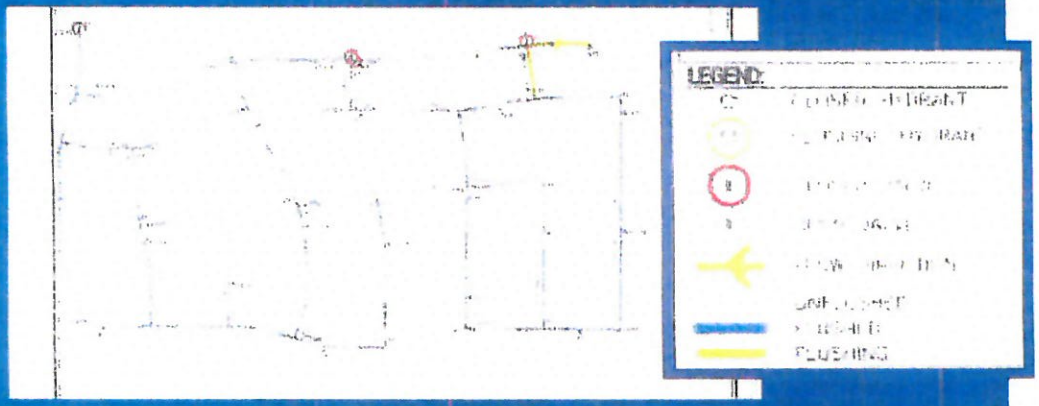
- Sized for completion by flushing crew in 1 day
- Assures valves don't stay closed for extended periods
- Alphabetically sequence assures clean water moves into dirty areas (and not vise versa)



3.

Field Mapbooks

- Detailed Steps
- Step-by-Step Specific for Each Loop
- Color Coded Maps
- Test Sheets (feedback)



Step	
1	close valve close valve close valve close valve close valve close valve open hydrant
2	close hydrant open valve open valve close valve close valve open hydrant
3	close hydrant open valve close valve open hydrant
4	close hydrant open valve open valve

4.

Pilot Testing

Worst Case Loops

Assess extent of any needed repairs

Best Case Loops

Road tests Mapbook procedures with field staff

Lesson Learned: Field Reconnaissance (Hydrant, Valves and Blow-offs) and include time to exercise valves

5.

Implementation

Safety	Accident Prevention, Emergency Response, Traffic Control, First Aid
Response Plans	Predict and Plan: WQ Complaints, Ruptures, Stuck Valves, etc.
Public	Raise Need Awareness, Give Notice, Stick to Schedule

5.

Implementation

Pre-Flushing Site Visit

Mark Hydrants, Clean Valve Boxes, Exercise Valves, Identify Potential Problems