

# Paradise Valley Watershed Studies

## *Update to Town Council*

Thursday, November 17th



Town of Paradise Valley  
**WATERSHED STUDIES**

**Dibble**  
Engineering

**Michael Baker**  
INTERNATIONAL



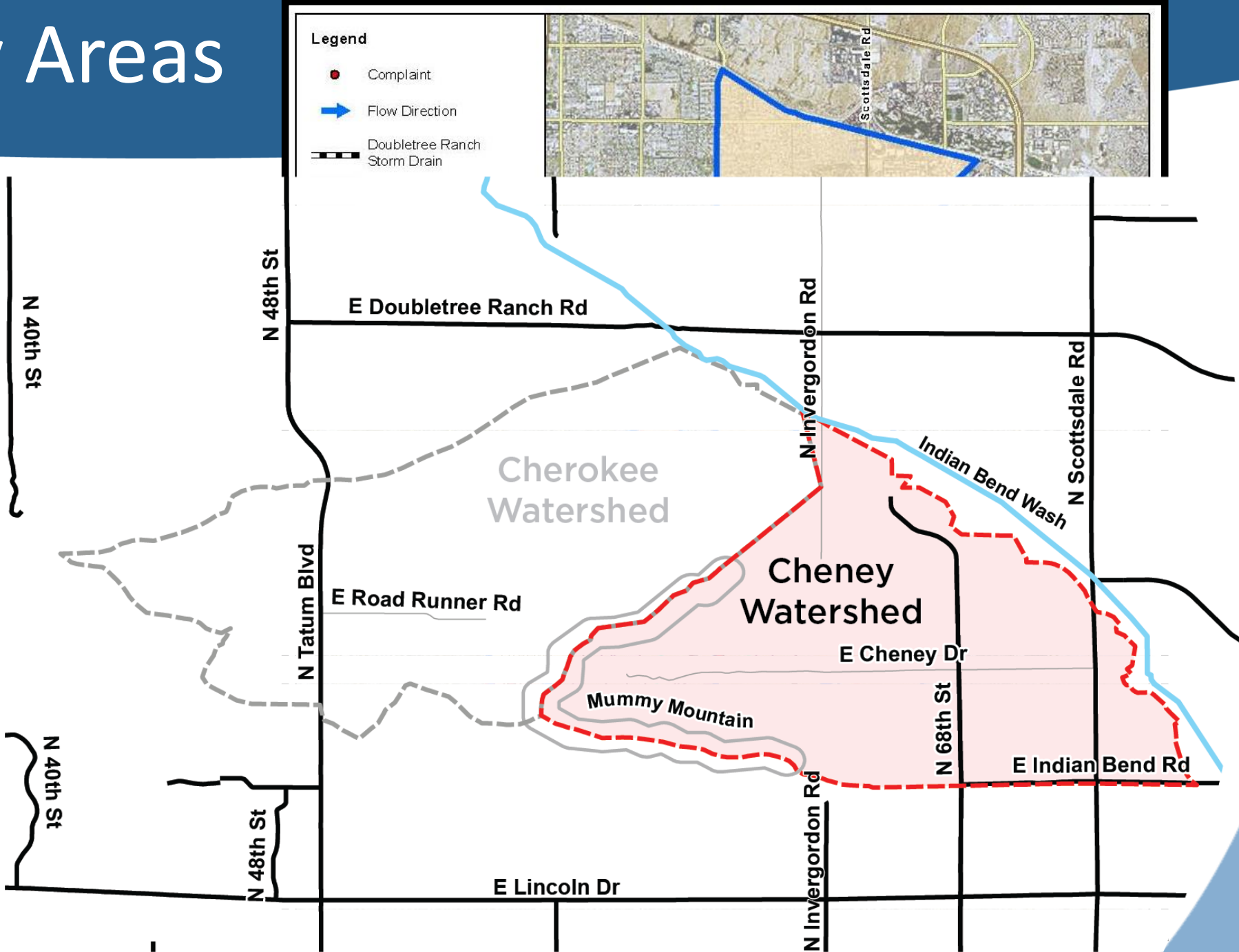
# Meeting Purpose

- Update Town Council on:
  - Project Purpose
    - FCDMC Projects
  - Public Information and Outreach
  - Hazards Identification
  - Draft Alternatives Analysis

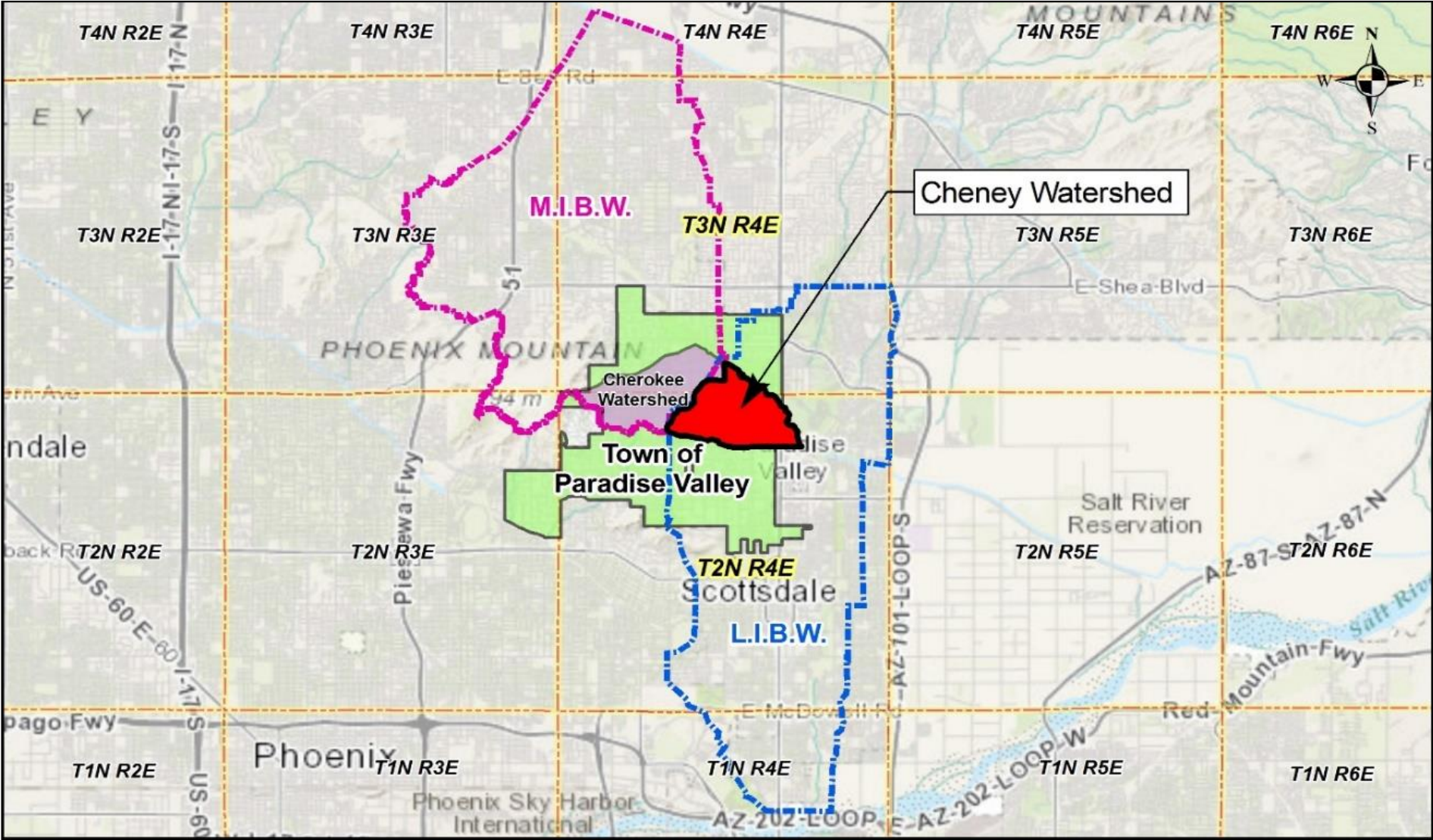
# Project Purpose

- Continue the community discussion about flooding and what to do about it
- Identify flooding and erosion hazards
- Gauge public tolerance for flood risk
- Investigate possible solutions to flooding
  - Help you understand what it takes manage/improve drainage
- Investigate funding for drainage projects
- Have an informed discussion on what the Town's role in managing stormwater could be
- Update the Town's Stormwater Standards

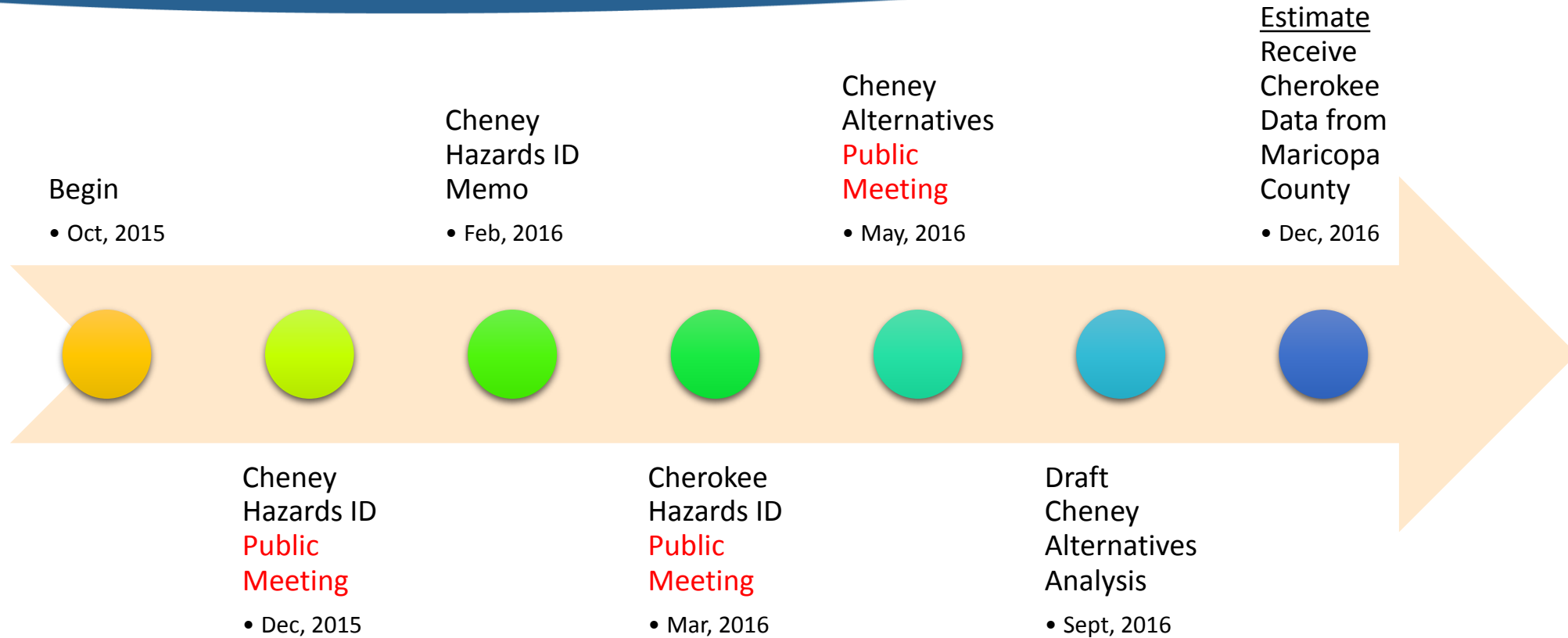
# Study Areas



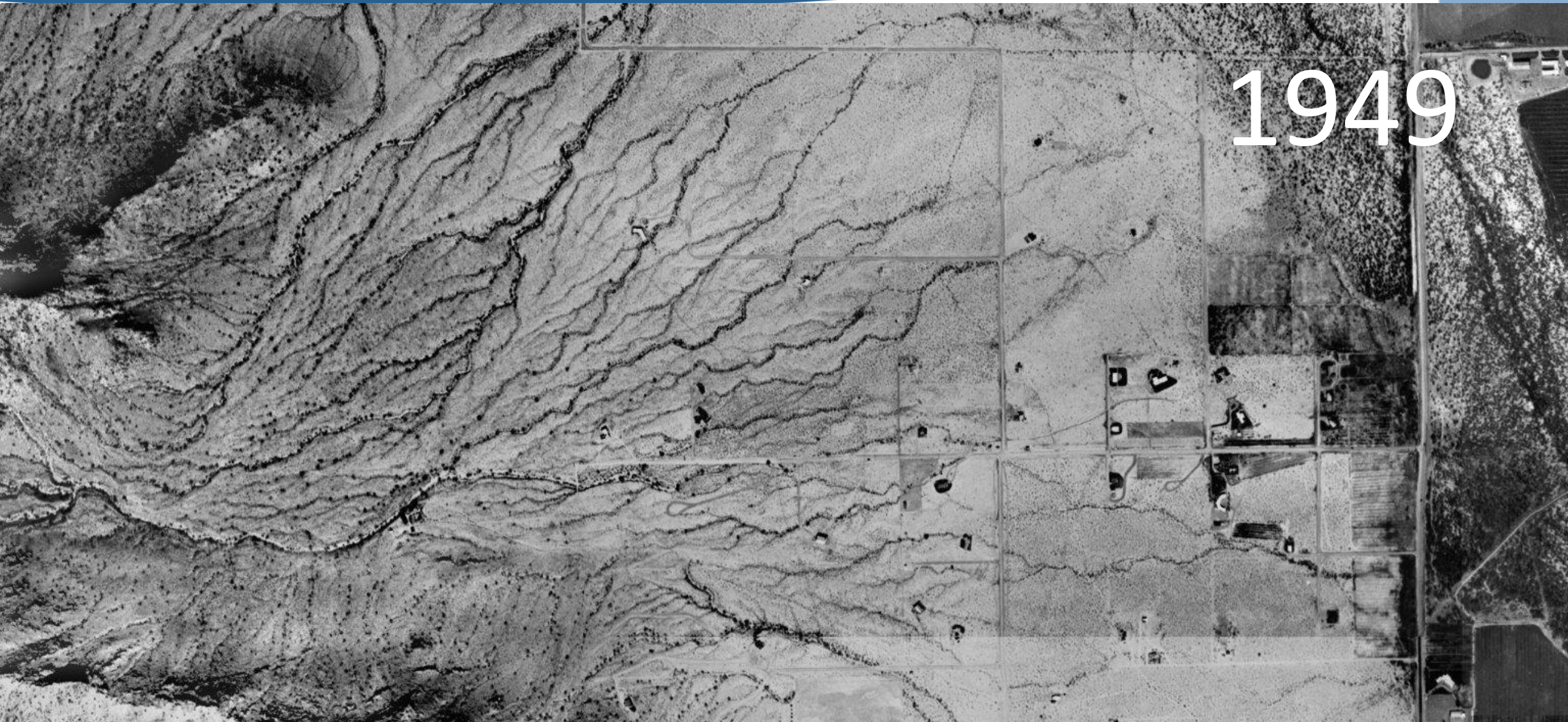
# Study Areas



# Project Timeline



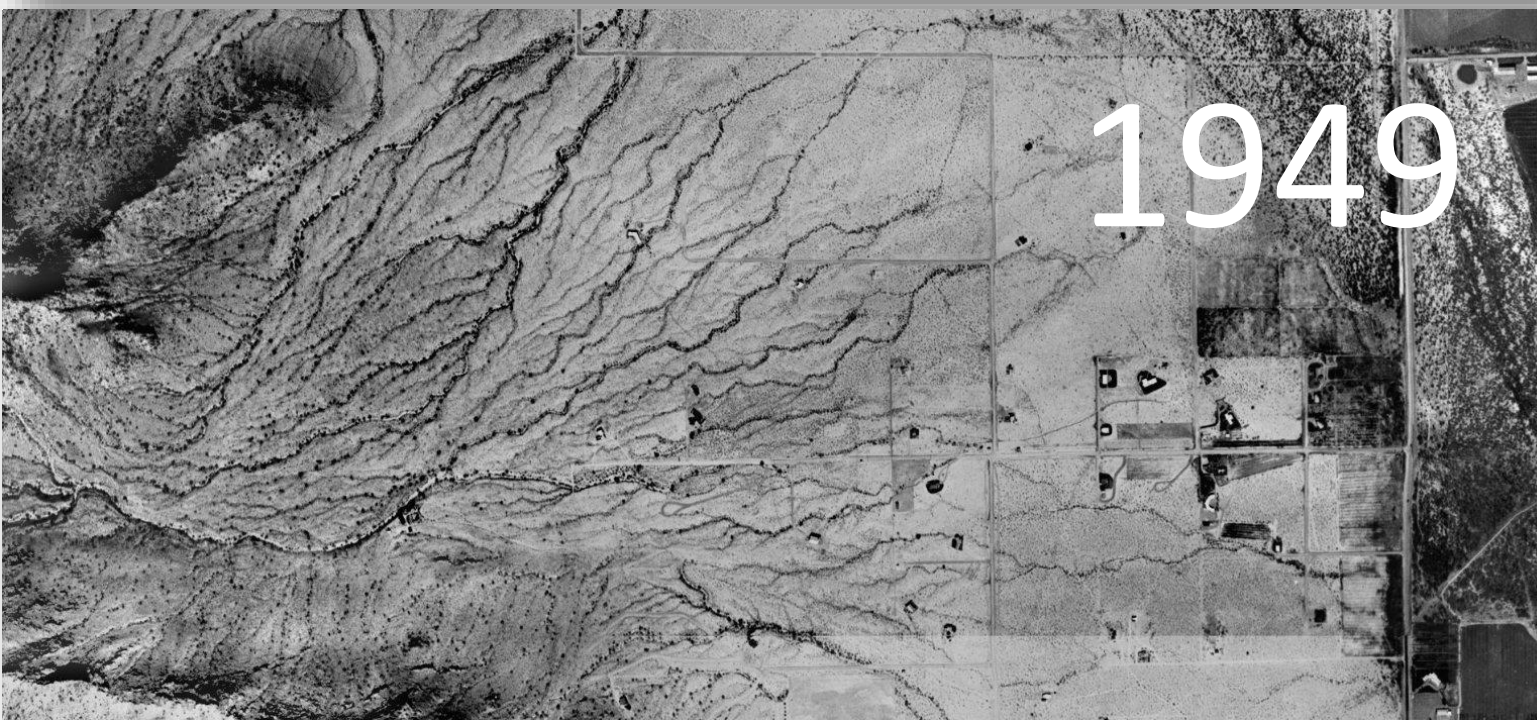
# Why We're Here?



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2016



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# Why We're Here?



# Public Information and Outreach

## What Have We Done?

- Advertised project on Town website
- Publish a project newsletter
- Held three public meetings
  - Advertised in the Paradise Valley Independent
  - Post card mailers sent to residents
  - Emailed residents using the Town's Code Red service
- Solicited feedback using online surveys
  - 80 respondents (5% of the Cheney Watershed owners)




# Public Information and Outreach

- Advertise Project on Town Website



# Public Information and Outreach

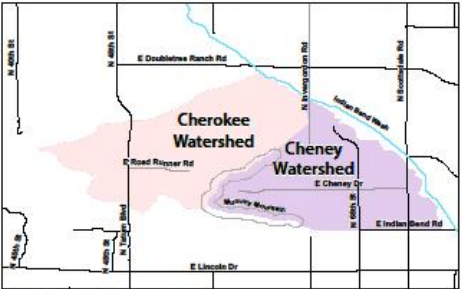
- Project Newsletter Emailed to Residents



## Paradise Valley Watershed Study Newsletter Project News & Updates

### Study To Identify Local Flood Hazards And Develop Solutions In Paradise Valley

The Town of Paradise Valley is conducting an engineering study to identify local flood hazards and develop solutions to mitigate flood damage in the Town. The study is both in response to large storm events and resulting property damage on September 8, 2014 and September 27, 2014, as well as the potential for future flooding in the Town. This study is the first of three to be performed by the Town. This first study is specifically focusing on the Cheney and Cherokee watersheds. Future studies will focus on additional watersheds in Paradise Valley.




Project Study Areas

### What the Project IS


The Paradise Valley Watershed Study is to identify flooding and erosion hazards within the Town, and continue the community discussion about flooding and what to do about it. The study is intended to gauge the public tolerance for flood risk, and investigate possible solutions to the flooding. The Town will then develop a master plan for drainage improvements, update the Town's storm water guidelines and develop the Town's detention/retention requirements.

### What the Project is NOT

The Paradise Valley Watershed Study is not a duplication of the Flood Control District of Maricopa County (FCDMC) Lower Indian Bend Wash and Middle Indian Bend Wash Area Drainage Master Study/Plan (ADMS/P) that began in 2012 and 2015 respectively. The two FCDMC ADMS/P processes address large regional (see map, to the right) problems within Paradise Valley, Scottsdale, Phoenix, and Tempe. The Town of Paradise Valley will benefit from the FCDMC's data collection as well as their computer modeling of area flooding. Paradise Valley's project focuses solely on local flooding conditions with solutions tailored to meet the specific needs of Paradise Valley.




Councilmember Hamway thanking the public for attending the first public meeting on Tuesday, December 8th 2015.




Legend  
Lower Indian Bend Wash  
Middle Indian Bend Wash  
Indian Bend Wash

Two FCDMC Study Areas in relation to Paradise Valley Cheney and Cherokee Watershed



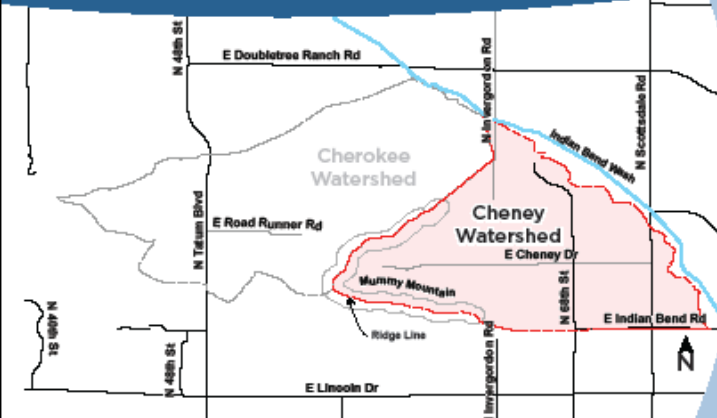
Issue 1 - January 2016



# Public Information and Outreach

- Sent Postcards to Residents
- Advertised in the Independent

**You are Invited!**  
**Paradise Valley Watershed Study Public Meeting #2 - Cheney Watershed**  
Wednesday, May 18th @ 6:00pm - 8:00pm  
Paradise Valley Town Hall




**Project Purpose:** In response to recent storm events and resulting property damage, the Town of Paradise Valley is conducting an engineering study to identify local flood hazards and develop solutions to mitigate flood damage in Paradise Valley.

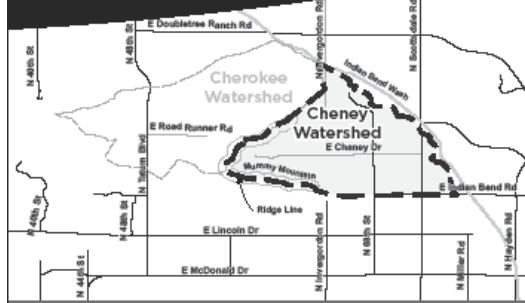
**Meeting Purpose:** Residents within the Cheney Watershed are invited to attend and learn about various drainage solution alternatives being considered and have the opportunity to rank their preferences among the alternatives.

NOTE: Cherokee Watershed residents will be asked to attend a separate meeting at a later date.

For More Information, please contact Jeremy Knapp, Engineering Services Analyst at (480)-348-3622 or James P. Shano, P.E., Public Works Director / Town Engineer (480)-348-3573. Visit the project website at [www.paradisevalleyaz.gov](http://www.paradisevalleyaz.gov)



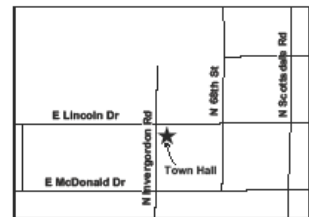
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**Meeting Location:**  
Paradise Valley Town Hall  
6401 E Lincoln Dr  
Paradise Valley, AZ 85253

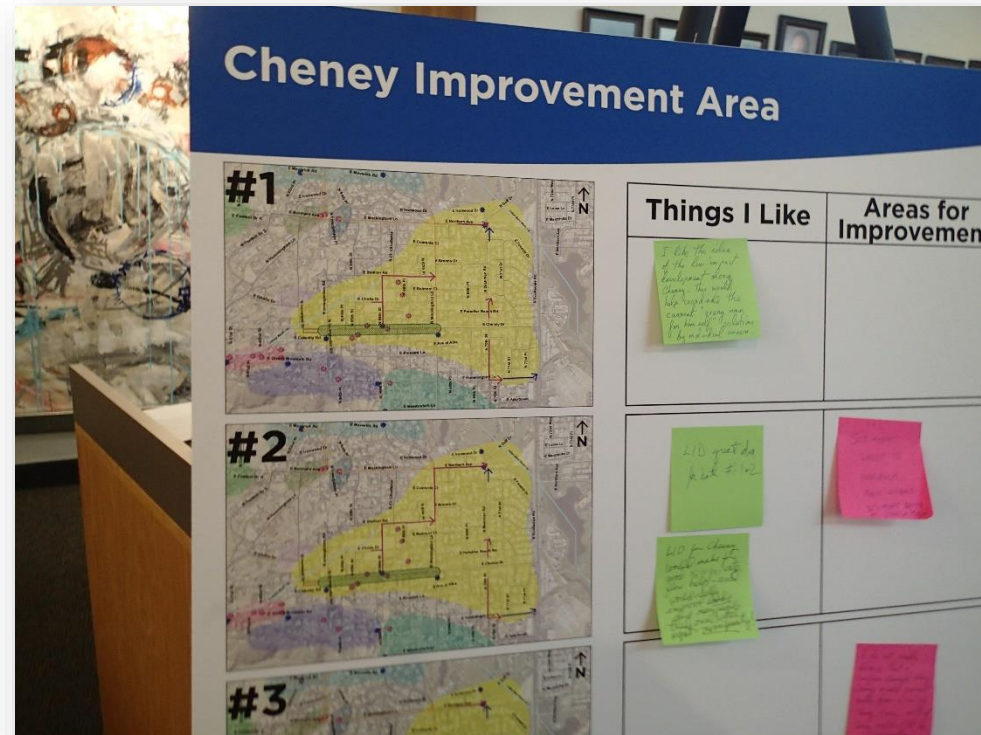
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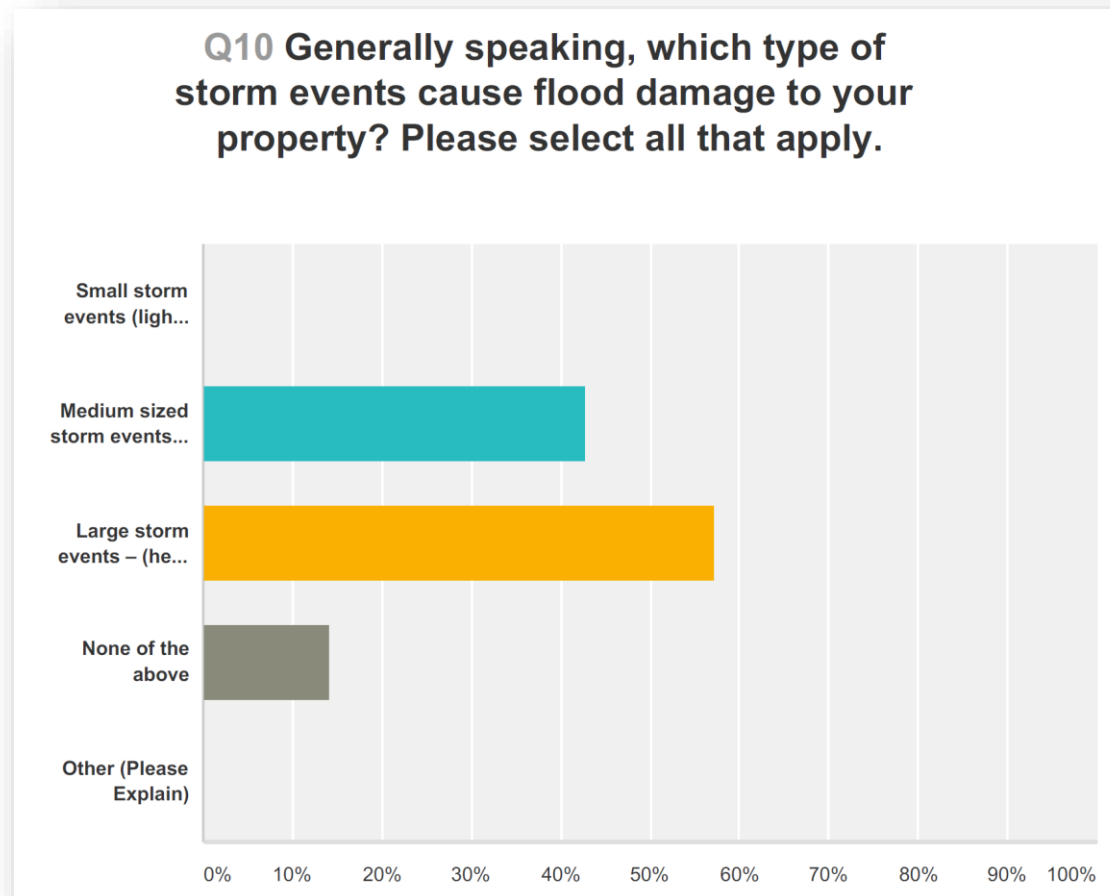
# Public Information and Outreach

- Three Public Meetings
  - Keep residents informed
  - Ask for their help



# Public Information and Outreach

- Solicited feedback using online survey
  - 24 Questions
  - 80 respondents (5% of owners)



# Public Information and Outreach

## Trends in the Data:

- Nearly all respondents were speaking about their home that they own
- Roughly half have been in their home for over 20 years
- 66% stated that either their home, their property or the street in front of their property was flooded during the September, 2014 event
- About 50% expressed that they are experiencing more frequent flooding damage than they have in the past
- 10% stated that they experience flooding damage from either small or medium events... (thus, most damage is from large events)



# Public Information and Outreach

## Trends (cont.):

- Respondents were equally likely to experience the effects of sediment and debris deposition as they were with flooding
- Over 50% said that the Town should spend public funds to reduce or eliminate flood damage to the road in front of their property
- Over 60% responded that they would be in favor of the Town taking a more active role in managing or maintaining local washes

# Public Information and Outreach

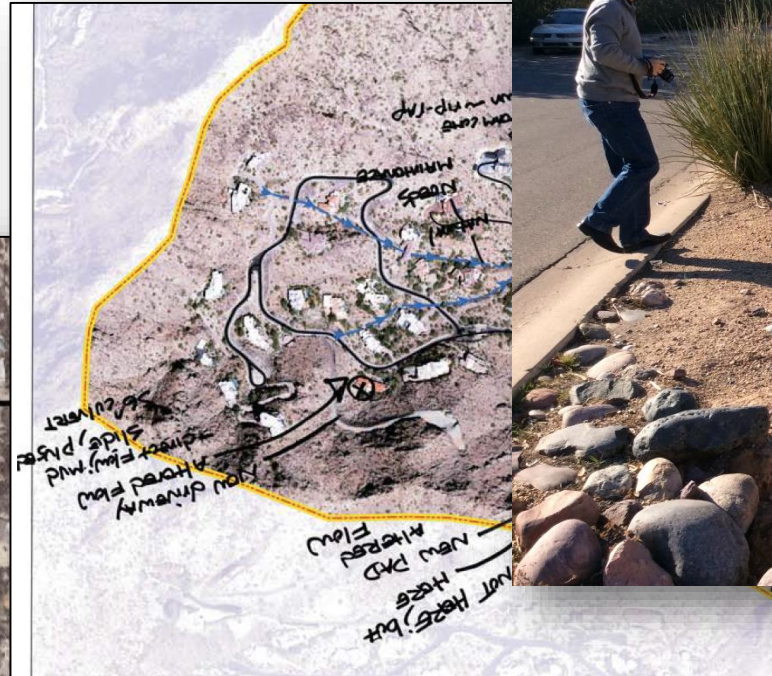
## Two Conclusions:

1. Both flood damage and the inconvenience of cleaning up sediment/debris are concerns to the residents
2. There is momentum building to possibly support implementing a stormwater management fee and expending public funding to mitigate flood damage risk.
3. This support is primarily for the protection from larger storm events (not the September, 2014 storm).

# Hazard Identification

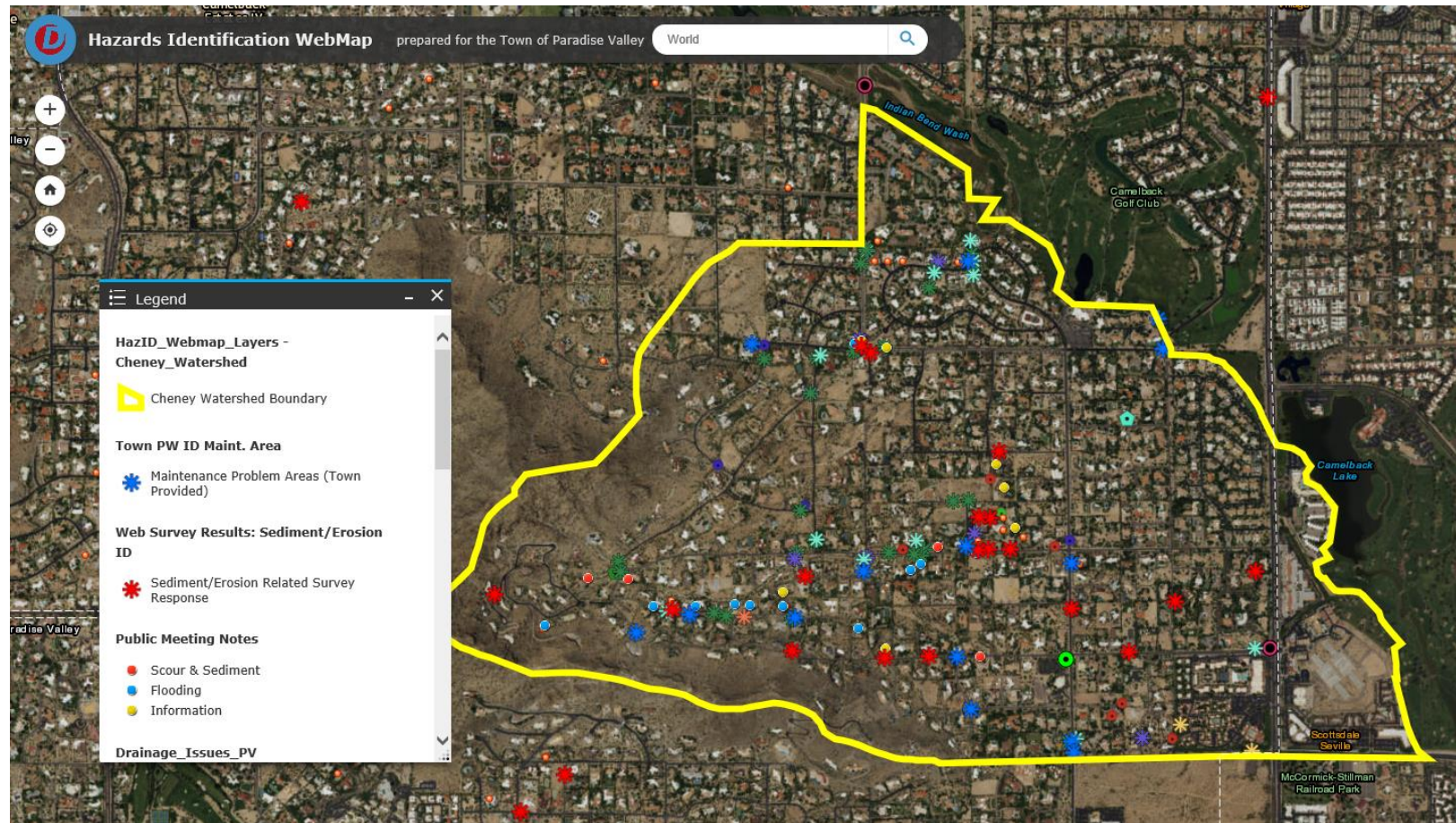
# Hazard Identification

- Town Staff Input
- Public Involvement
- Field Investigations



# Hazard Identification

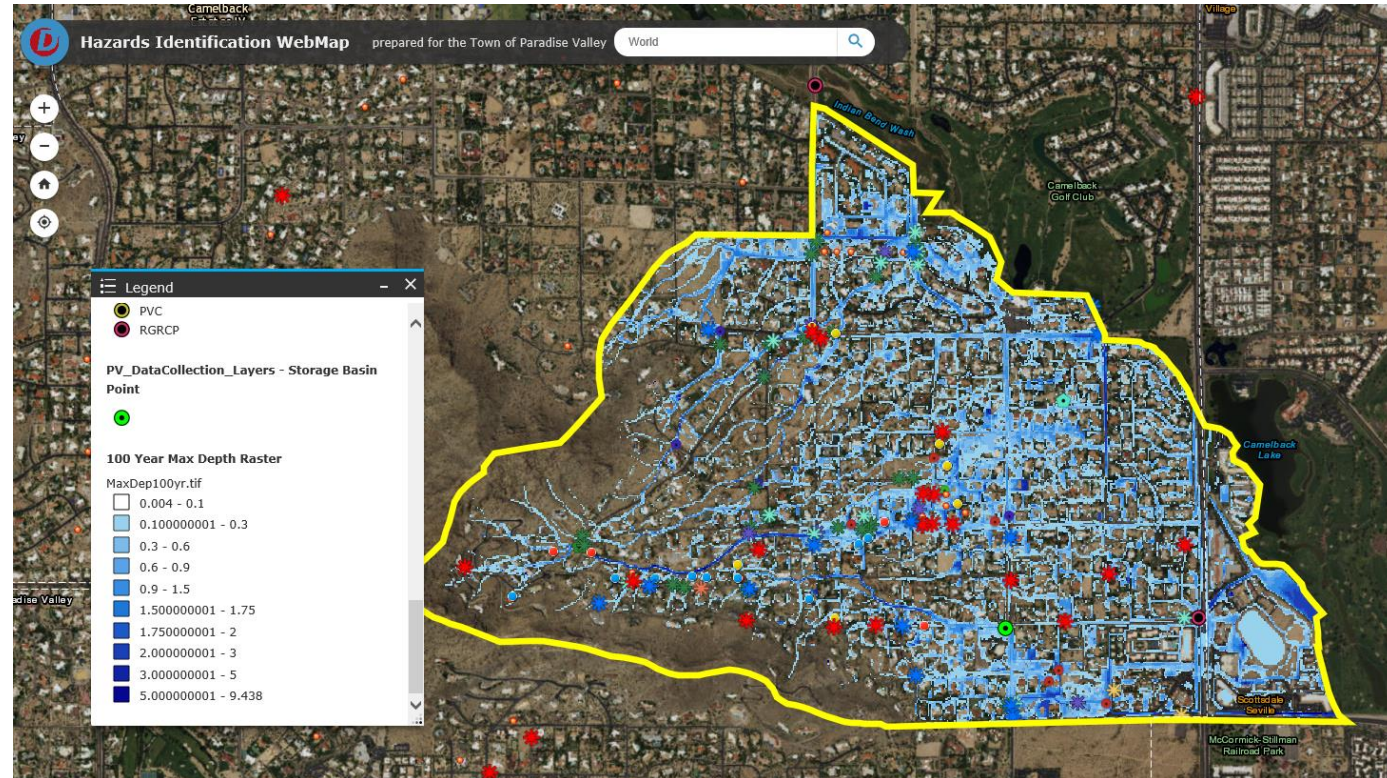
- Online GIS Webmap

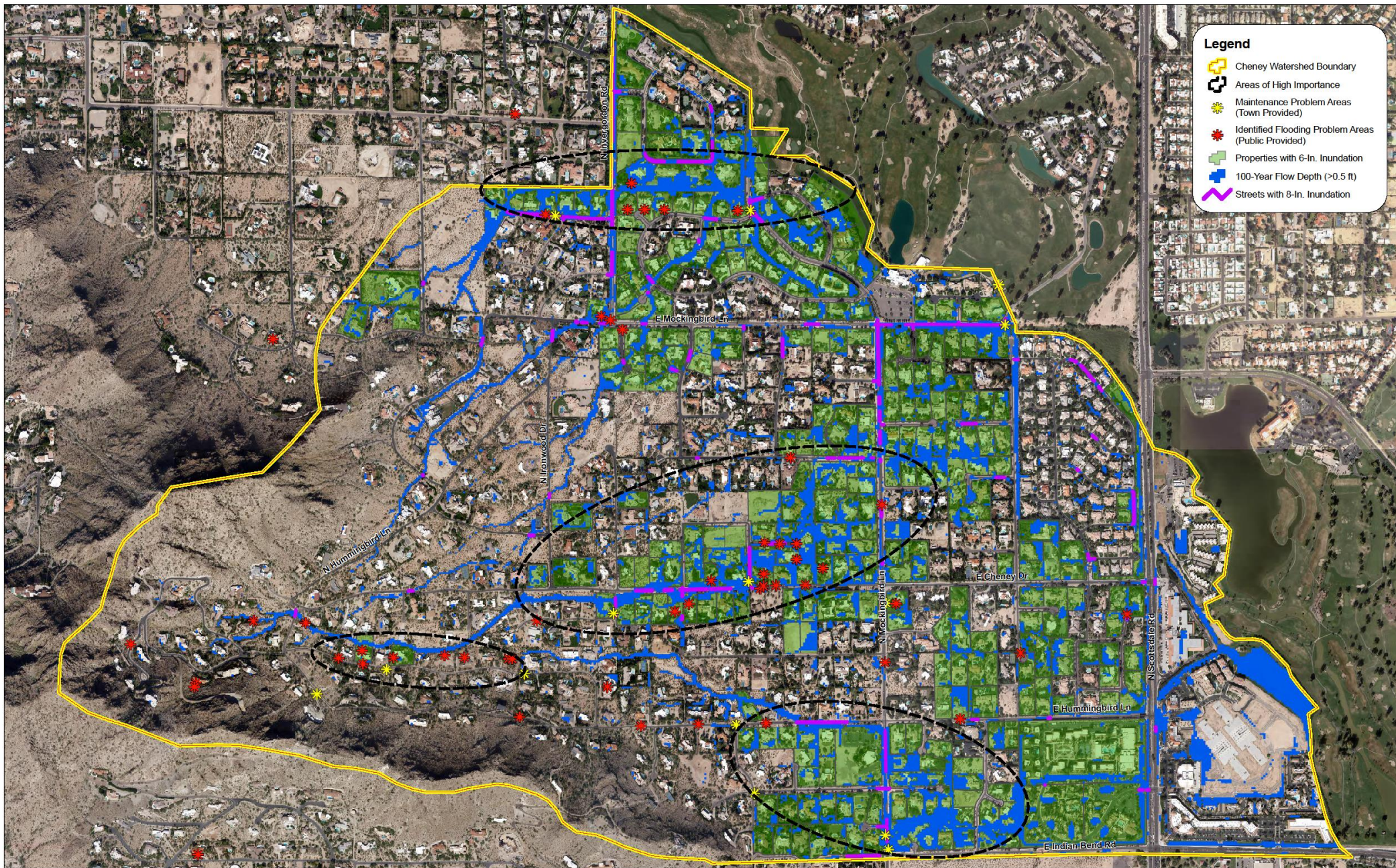


# Hazard Identification

## Purpose of Modeling

- Structure Inundation
- Property Inundation
- Street Inundation
- Scour & Sedimentation





**Legend**

- Cheney Watershed Boundary
- Areas of High Importance
- Maintenance Problem Areas (Town Provided)
- Identified Flooding Problem Areas (Public Provided)
- Properties with 6-In. Inundation
- 100-Year Flow Depth (>0.5 ft)
- Streets with 8-In. Inundation

# Hazard Identification

## Cheney Watershed Statistics

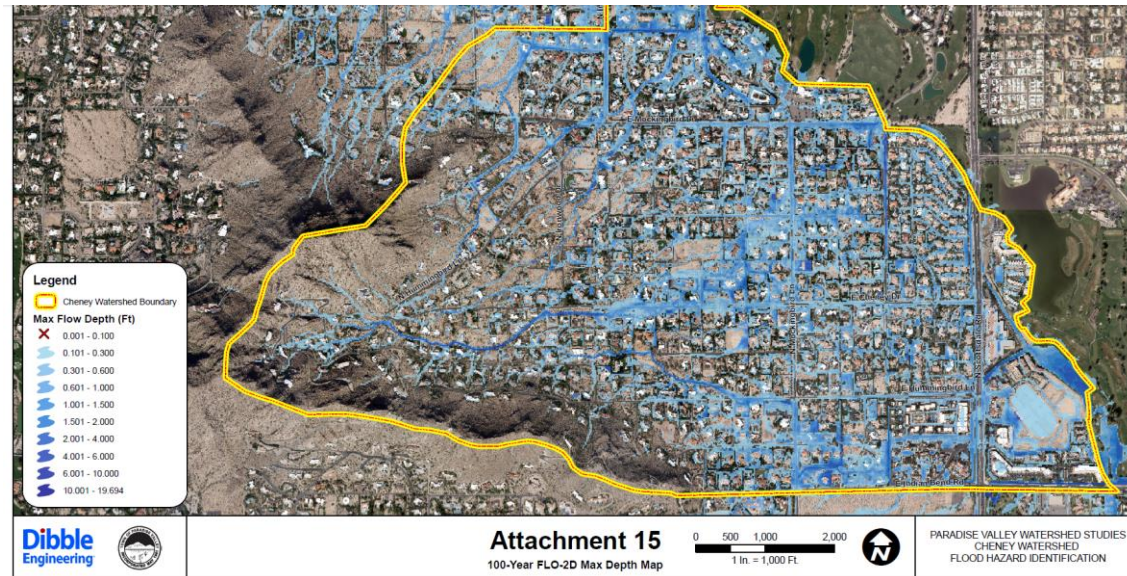
- 1,400 Structures
- 1,521 Parcels
- 25 Miles of Streets

## Findings (10-year)

- 39 Structures (3%)
- 221 Parcels (15%)
- 1.8 miles of Streets (7%)

## Findings (100-year)

- 125 Structures (9%) ← nationally 5% are in a FEMA floodplain
- 322 Parcels (21%)
- 2.7 miles of Streets (11%)





# Alternatives Analysis

# Alternatives Analysis

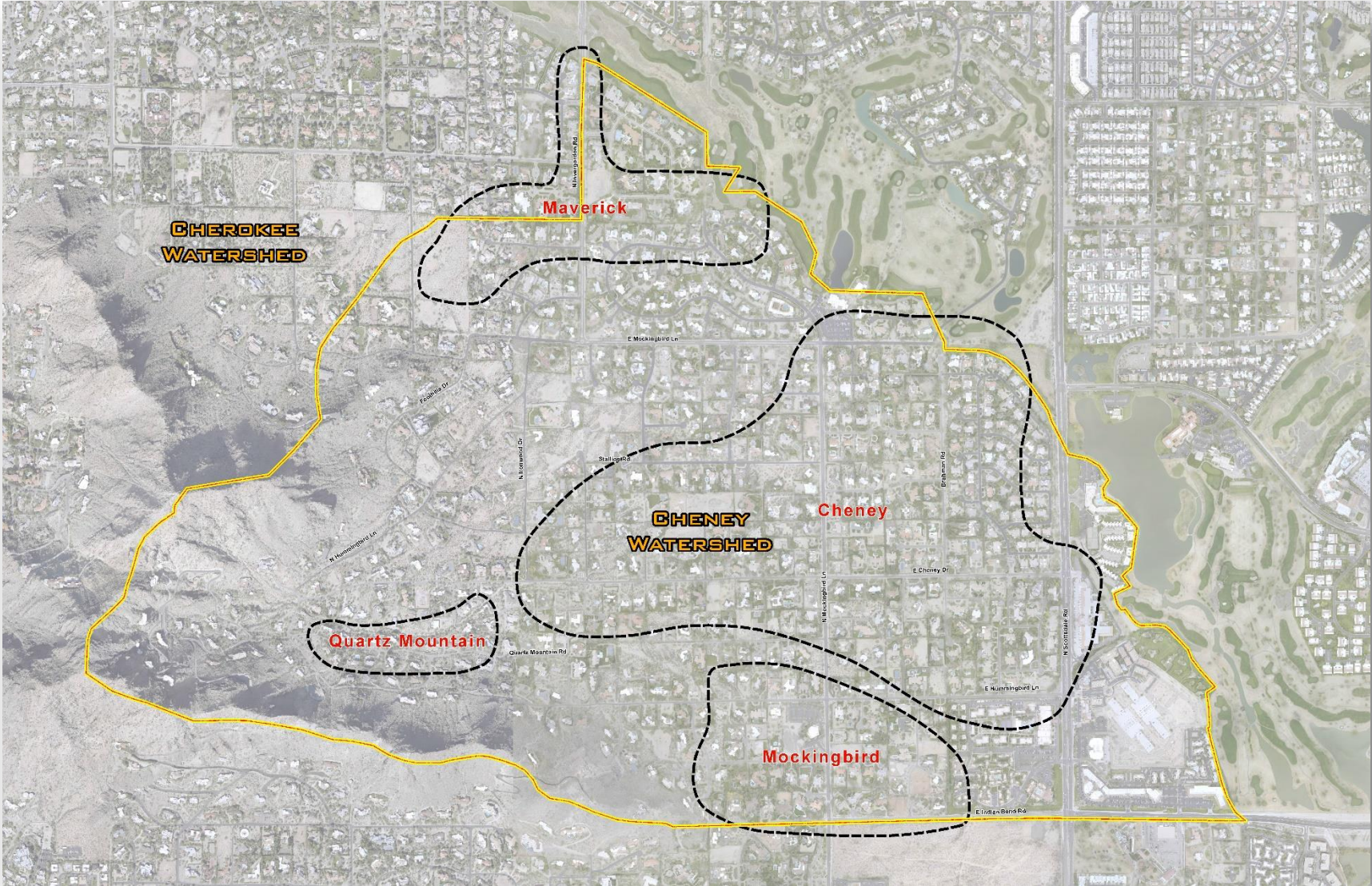
## Scope:

- Develop possible drainage improvements
- Modeling them to estimate their effectiveness
- Evaluate multiple levels of protection
- Estimate their costs
- Evaluate each holistically

...and...

- Account for possible Maricopa County improvements
  - What happens if the County doesn't Build theirs?

# Alternatives Analysis



Evaluation Categories:

- Performance
- Cost
- Public Acceptance
- Constructability/Construction Phasing



Table 1 – Cheney 1 Flow Depth Reduction

Flow Depth Reduction Ranges	10-Year No. of Buildings	100-Year No. of Buildings
0.101 - 0.5	*	6
0.501 - 1.0	*	31
1.001 - 1.5	*	6
1.501 - 2.0+	*	2
		45

Paradise Valley Watershed Studies - Cheney Watershed

Preliminary Cost Estimate  
Milestone: Alternatives Analysis

main inundated for the 10-year storm event

Flooding Reduction

100-Year Street Flooding Reduction		
Exst Length (Miles)	Proposed Length (Miles)	Reduction Length (Miles)
1.17	0.78	0.39

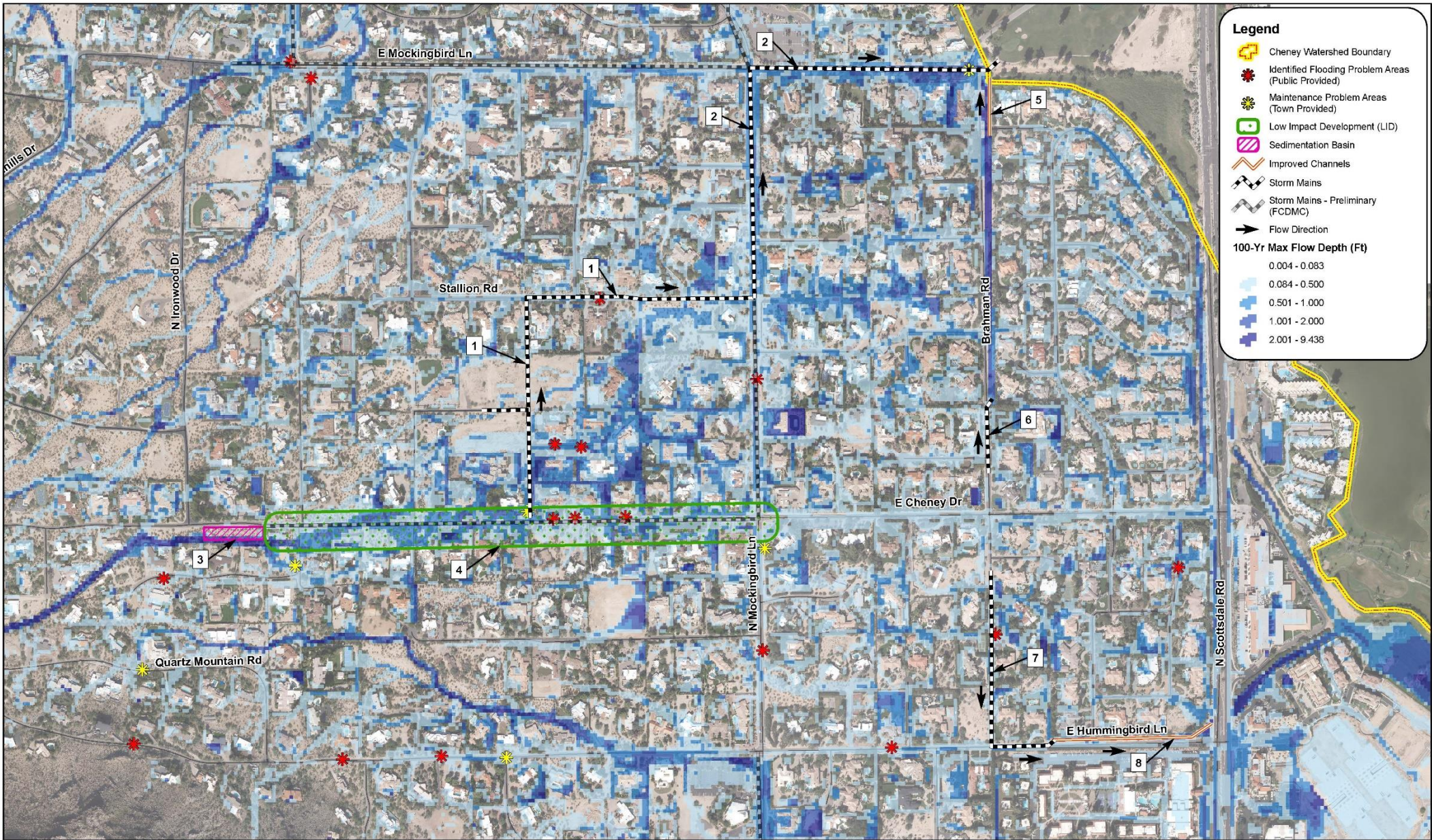
Alternative Cheney 1

Element ID	Description	Potential Utility Relocation Cost (30% Contingency)	Land Aquisition Cost	Costruction Cost (30% Contingency)	Mobilization, Miscellaneous Removals, & Traffic Control	Element Cost
P1-1	1291 LF of 48" Ø Storm Drain	\$143,000	\$312,000	\$631,498	\$36,058.56	\$1,122,557
P1-2	187 LF of 24" Ø Storm Drain	\$0	\$0	\$90,464	\$5,166	\$95,630
P1-3	1310 LF of 48" Ø Storm Drain	\$250,900	\$0	\$634,842	\$36,249	\$921,991
P2-1	* 1366 LF of 2-60" Ø Storm Drain	\$0	\$0	\$0	\$0	\$0
P3-1	435 LF of 30" Ø Storm Drain	\$44,200	\$0	\$203,743	\$11,634	\$259,576
P4-1	759 LF of 30" Ø Storm Drain	\$35,100	\$291,200	\$334,767	\$19,115	\$680,182
P4-2	1246 LF of 30" Ø Storm Drain	\$75,400	\$0	\$520,263	\$29,707	\$625,370
B1-1	Sediment Basin	\$18,200	\$195,000	\$23,120	\$1,320	\$237,640

\* Element represents a FCDMC planned element

Construction Cost	\$2,577,946
Land Acquisition Cost	\$798,200
Utiliy Relocation Cost	\$566,800
<b>Total Cost</b>	<b>\$3,942,946</b>



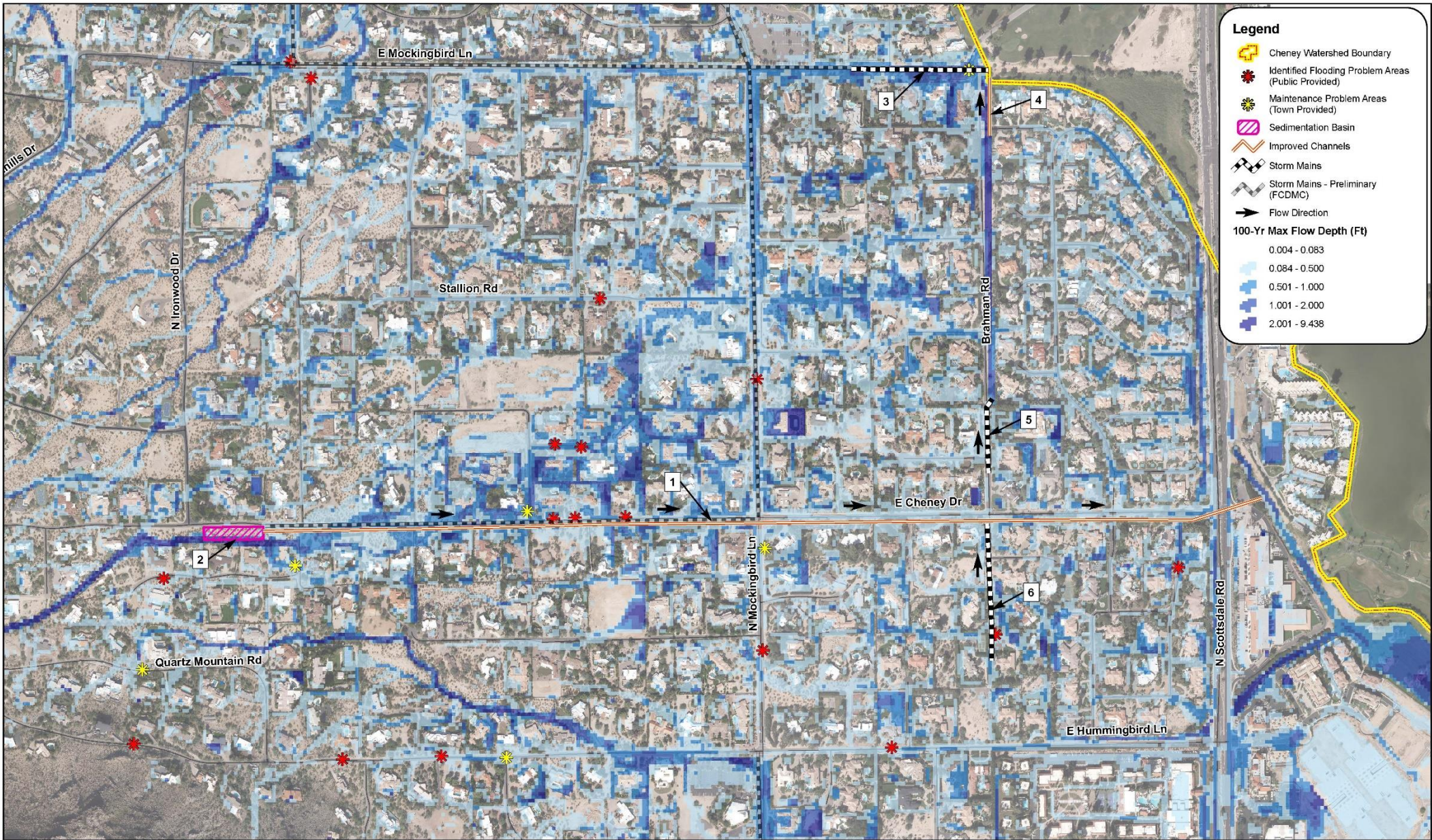


**Legend**

- Cheney Watershed Boundary
- Identified Flooding Problem Areas (Public Provided)
- Maintenance Problem Areas (Town Provided)
- Low Impact Development (LID)
- Sedimentation Basin
- Improved Channels
- Storm Mains
- Storm Mains - Preliminary (FCDMC)
- Flow Direction

**100-Yr Max Flow Depth (Ft)**

- 0.004 - 0.083
- 0.084 - 0.500
- 0.501 - 1.000
- 1.001 - 2.000
- 2.001 - 9.438



**Legend**

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- 0.004 - 0.083
- 0.084 - 0.500
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- 1.001 - 2.000
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# Alternatives Analysis

Alternative	Estimated Cost	Benefit (Structures No Longer Inundated)	
		10-Year Storm	100-Year Storm
Cheney 1	\$3.9M	20 (out of 20)	18 (out of 63)
Cheney 2	\$4.7M	20 (out of 20)	20 (out of 63)
Cheney 3	\$6.6M	20 (out of 20)	23 (out of 63)
Mockingbird 1	\$4.9M	5 (out of 7)	4 (out of 25)
Mockingbird 2	\$5.6M	5 (out of 7)	4 (out of 25)
Mockingbird 3	\$1.5M	5 (out of 7)	1 (out of 25)
Quartz Mntn 1	\$3.0M	N/A	N/A
Quartz Mntn 2	\$3.1M	N/A	N/A
Quartz Mntn 3	\$3.1M	N/A	N/A
Maverick 1	\$2.6M	5 (out of 9)	2 (out of 25)
Maverick 2	\$3.5M	7 (out of 9)	2 (out of 25)

# Alternatives Analysis

## Next Steps:

- Revise draft to include Town Staff comments (in progress)
- Conduct HAZUS analysis to estimate monetary value of benefits
- Finalize evaluations of alternatives & issue report



# Forthcoming Discussions

## Future Meetings:

- What role the town takes in managing stormwater going forward?
- Storm Drainage Design Manual

Questions?