

SANTA CRUZ COUNTY FLOOD CONTROL DISTRICT

NOGALES WASH – POTRERO CREEK CONCEPTUAL DRAINAGE MASTERPLAN SANTA CRUZ COUNTY, ARIZONA



Association of State Floodplain Managers
Annual Conference, June 21, 2018
John Hays, E.I.T, CFM
Santa Cruz County Flood Control District



Disclaimer

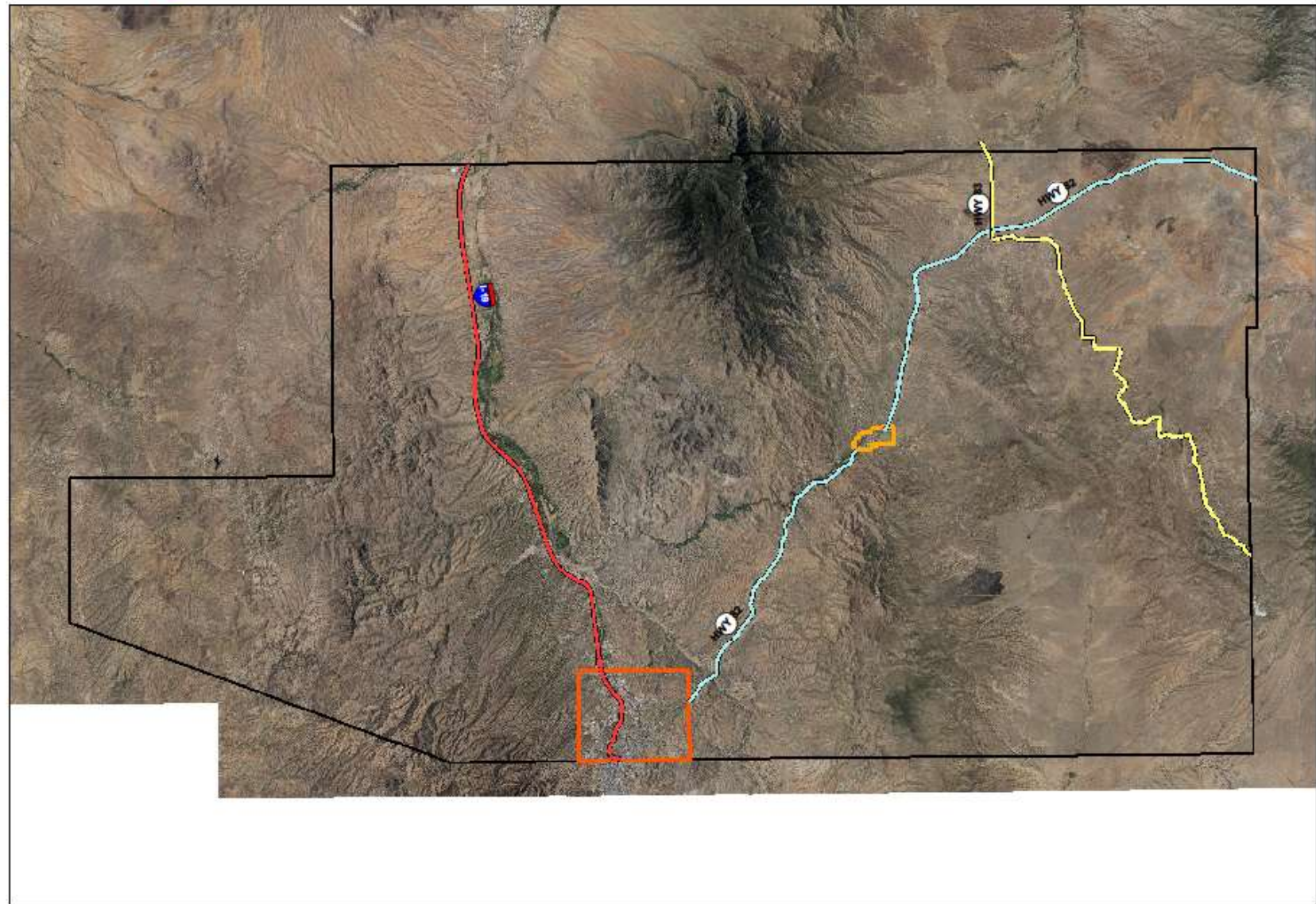
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Parcel information is known to be incomplete, and known to not necessarily match base photo.

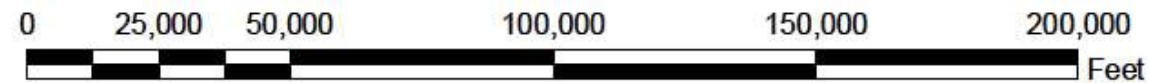
Flood Insurance is Required for Structures with a mortgage in Zones A, AE, and AO per Federal Regulations.

Digital Flood Insurance Rate Map - GIS Version



Legend

-  Santa Cruz County
- Highways
- ST_NAME
-  HWY 82
-  HWY 83
-  I-19



1:298,723

Contour Interval



Disclaimer

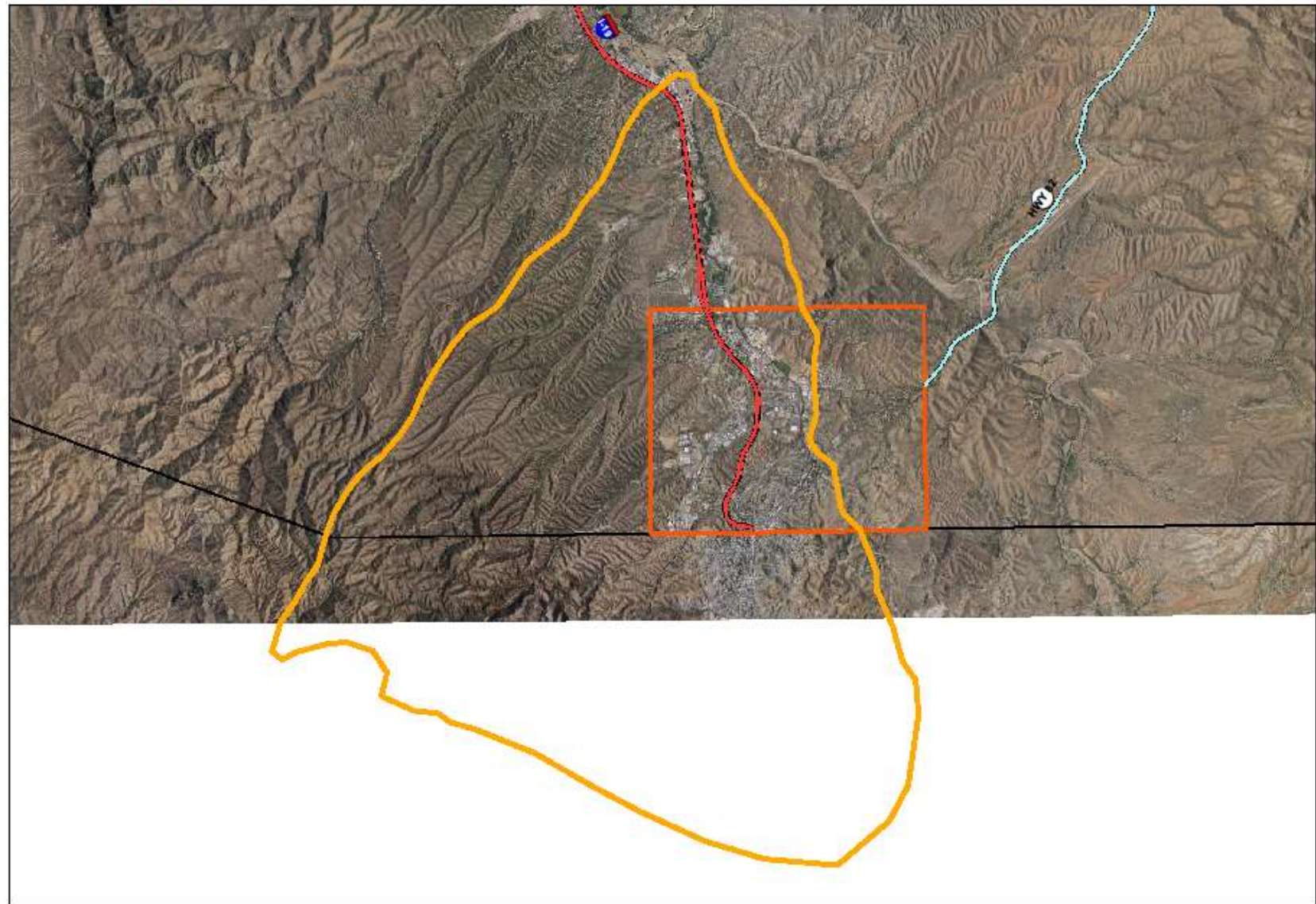
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- Highways
- ST_NAME
-  HWY 82
-  HWY 83
-  I-19

0 10,000 20,000 40,000 60,000 80,000 Feet

1:120,000

Contour Interval



Disclaimer

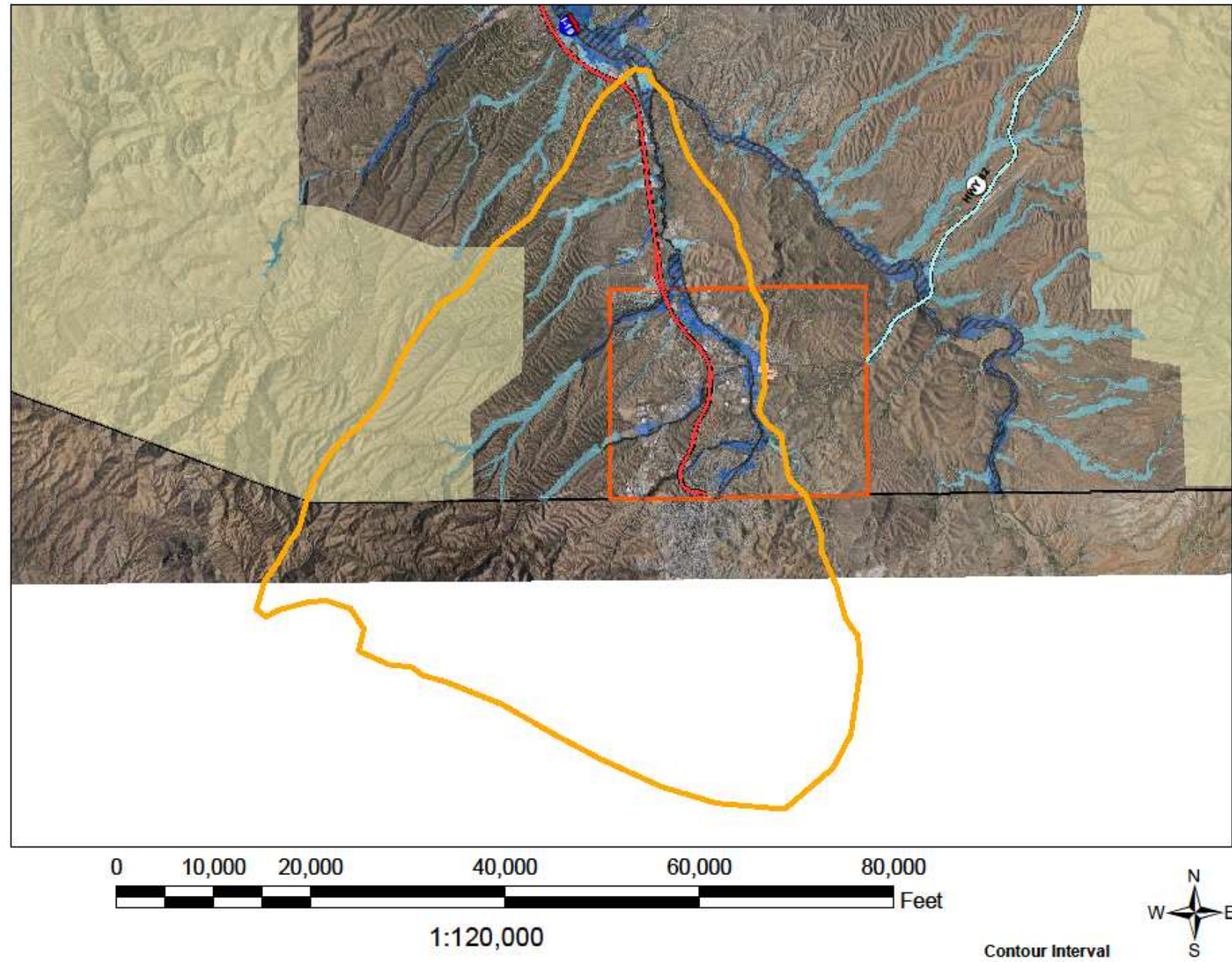
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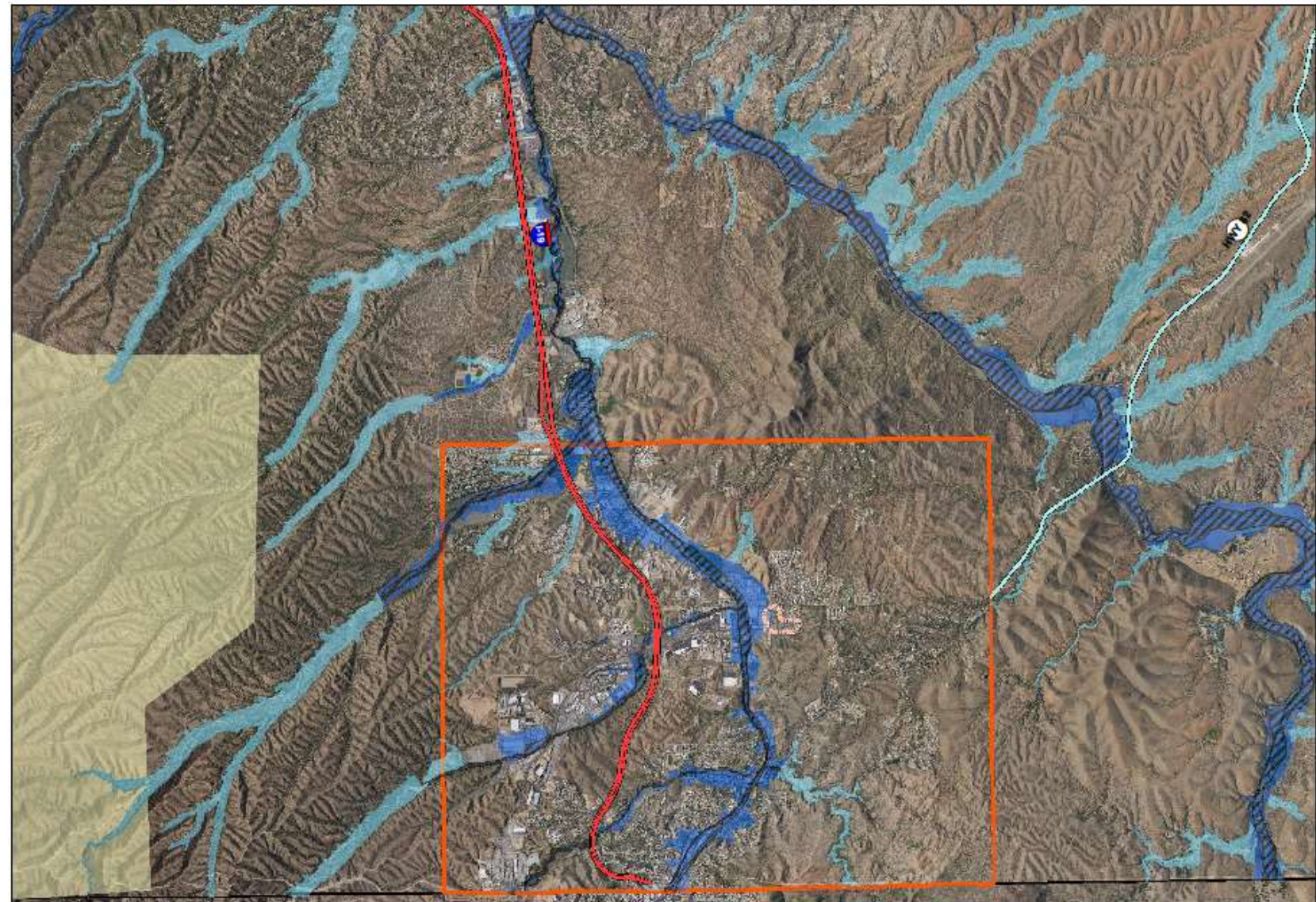
SFHA

-  FLOODWAY - No Construction Permitted
-  A - 1% Flood w/o Elevation
-  AE 1% Flood with Elevations
-  AO - Sheet Flood 1, 2, or 3 feet deep
-  X (Shaded) - 0.2% Flood
-  X - Minimal Risk (Federal)
-  D - Flood Risk Unknown (Federal)
-  Santa Cruz County

Highways

- ST_NAME
-  HWY 82
 -  HWY 83
 -  I-19

Digital Flood Insurance Rate Map - GIS Version



0 5,000 10,000 20,000 30,000 40,000 Feet

1:60,000

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Legend


— Roads

SFHA


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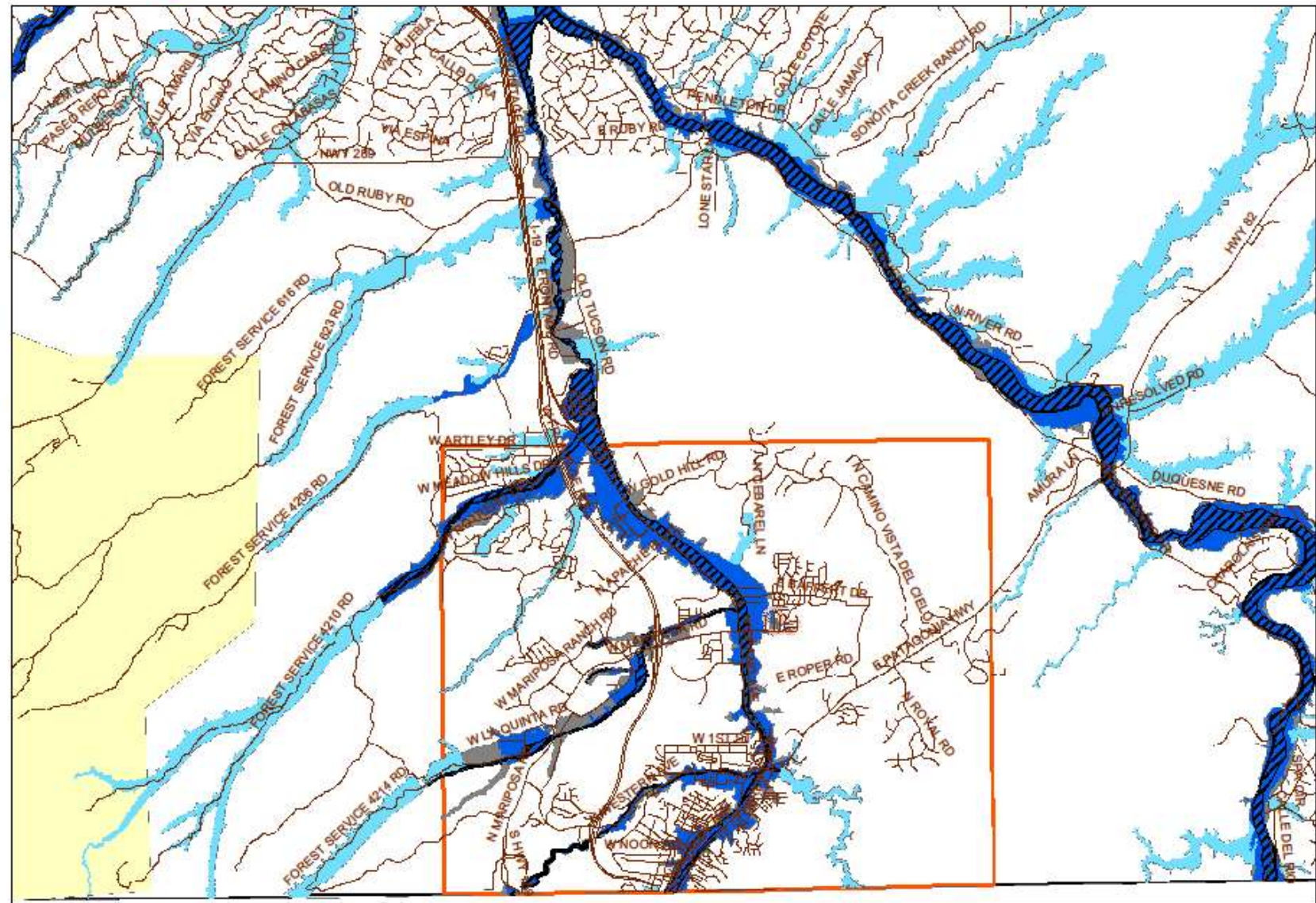
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 Santa Cruz County



0 5,000 10,000 20,000 30,000 40,000 Feet

1:60,000

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Legend

SFHA

FLD_ZONE, ZONE_SUBTY

FLOODWAY

A₁

AE₁

AO₁

X (Shaded)

X

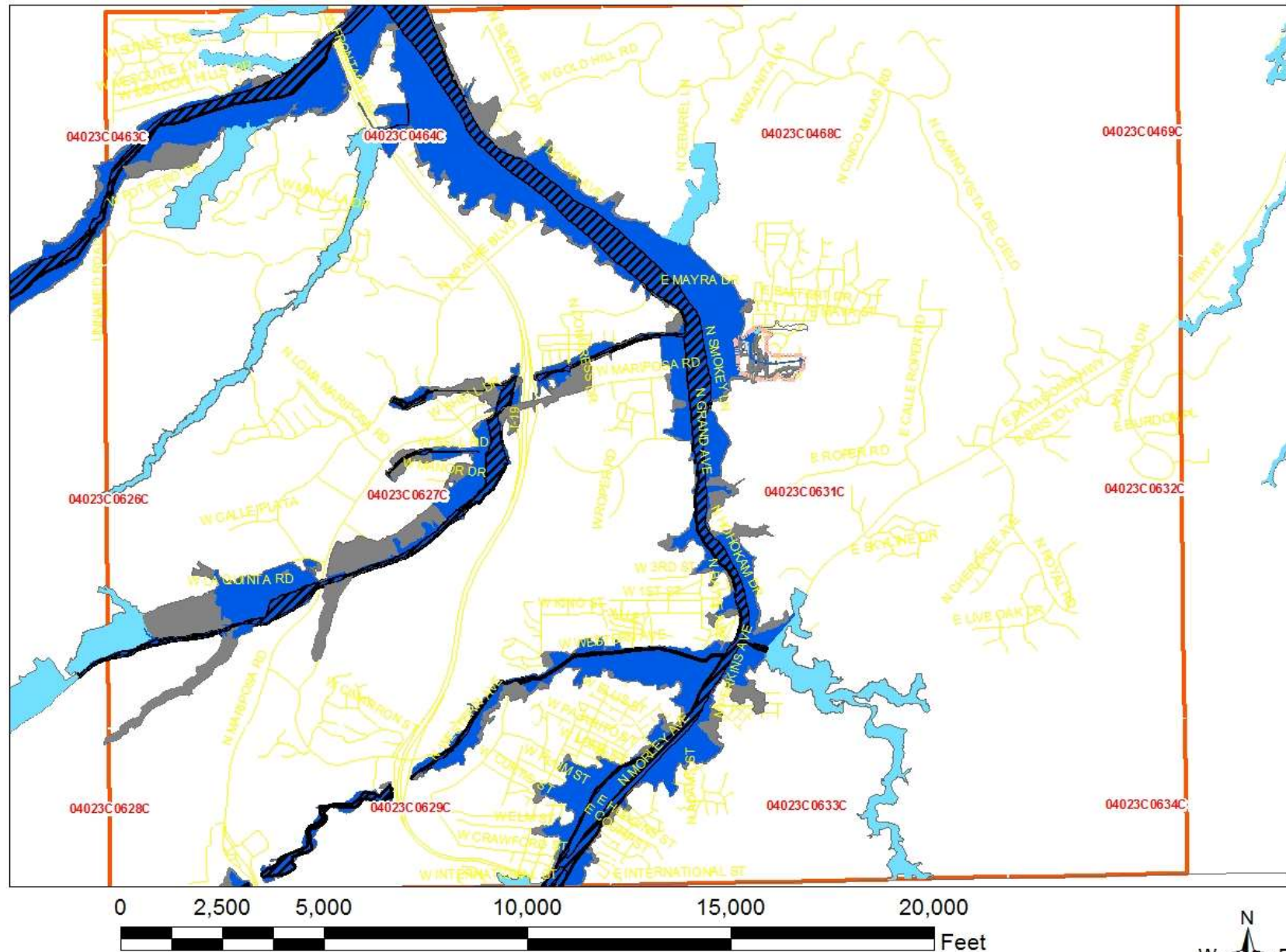
D₁

DFIRM Panels

Santa Cruz County

Roads

Digital Flood Insurance Rate Map - GIS Version



1:30,000

Contour Interval



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SFHA

FLD_ZONE, ZONE_SUBTY

FLOODWAY

A₁

AE₁

AO₁

X (Shaded)

X

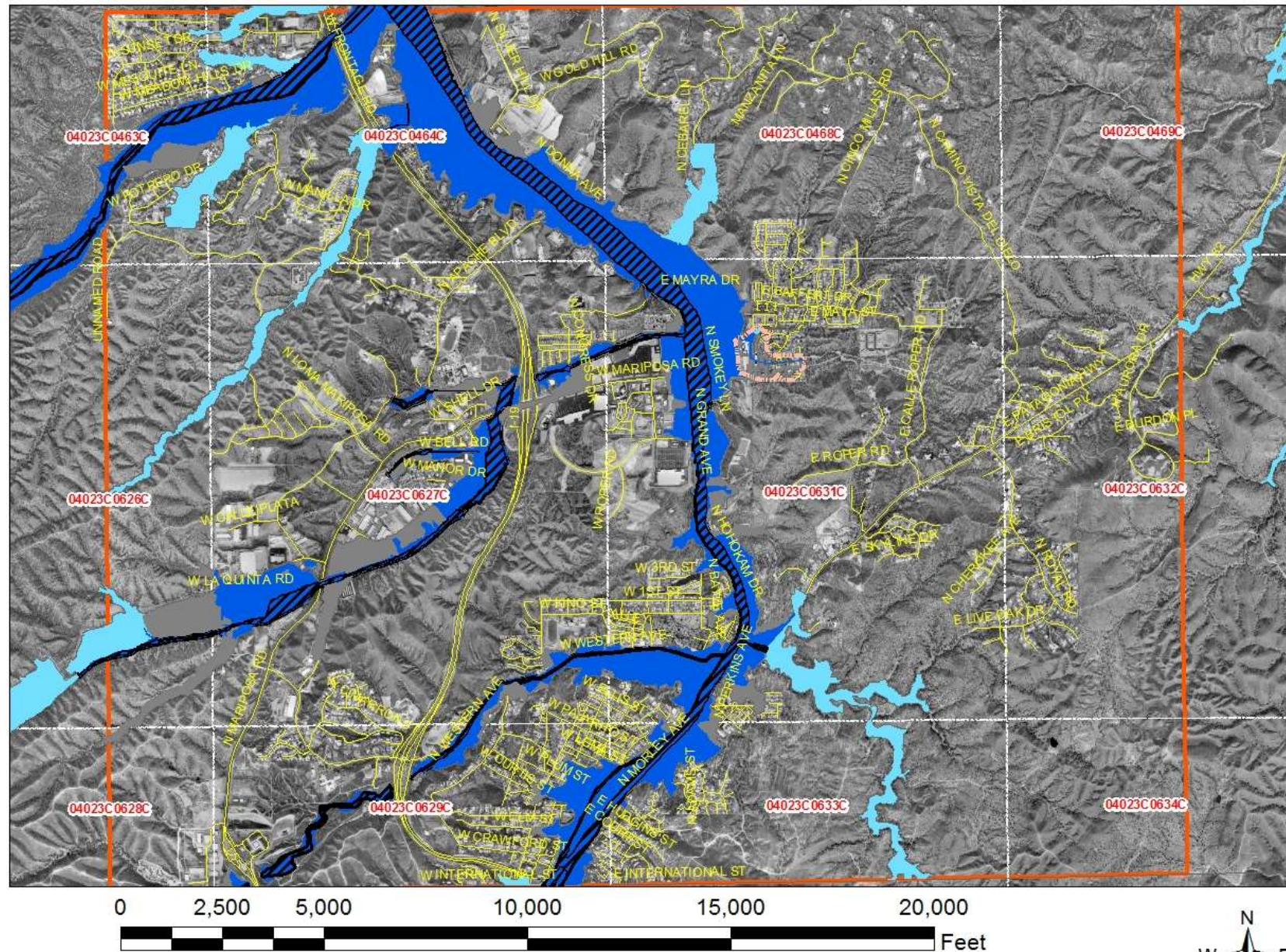
D₁

DFIRM Panels

Santa Cruz County

Roads

Digital Flood Insurance Rate Map - GIS Version



1:30,000

Contour Interval

CONCEPTUAL MASTER PLAN

- THE CONCEPTUAL MASTERPLAN FOR THE NOGALES WASH AND POTRERO CREEK INVOLVES A NUMBER OF PROPOSED AND POSSIBLE PROJECTS AND STUDIES TO TRY TO REDUCE OR MINIMIZE THE AFFECTS OF FLOODING, ESPECIALLY WITHIN THE CITY OF NOGALES, AND POINTS NORTHWARD TO THE POTRERO CREEK CONFLUENCE WITH THE SANTA CRUZ RIVER.
- THIS PLAN INCLUDES THREE LARGE REGIONAL RETENTION BASINS, POSSIBLE CHANNEL/TUNNEL IMPROVEMENTS, A HABITAT RESTORATION PROJECT, AND H&H STUDIES.

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Legend

SFHA

FLD_ZONE, ZONE_SUBTY

- 
- FLOODWAY

- A,**

- AE,

- 
- AO,

- X (Shaded)

- ☐

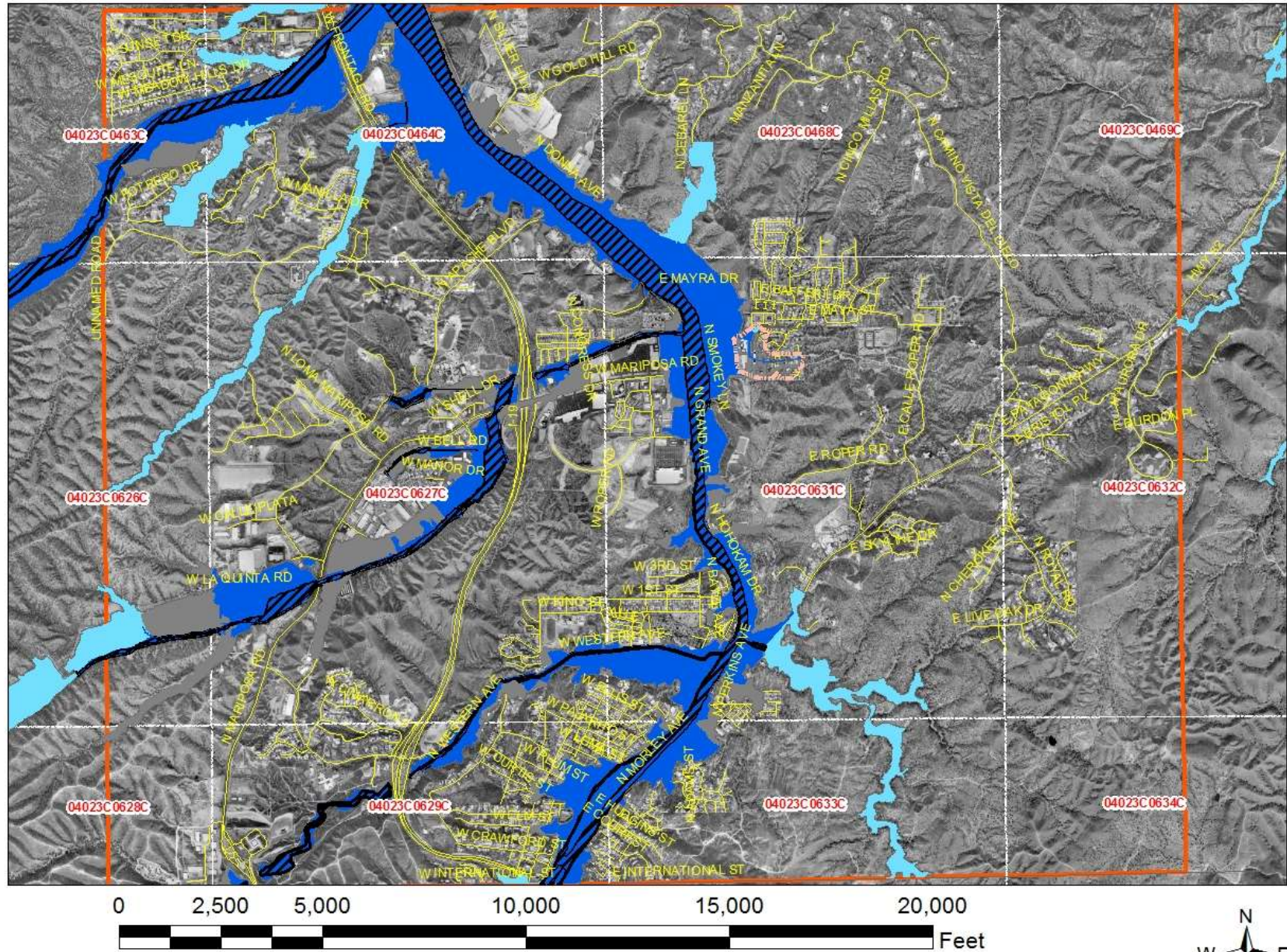
- D,**

- DFIRM Panels

- ☐
- Santa Cruz County

- ### Roads

Digital Flood Insurance Rate Map - GIS Version



1:30,000

Contour Interval



EPHRIAM DETENTION BASIN

- THE AREA BETWEEN I-19 AND THE MARIPOSA PORT OF ENTRY, SOUTH OF HOLY CROSS HOSPITAL IS IDEAL FOR THE CONSTRUCTION OF A DETENTION BASIN TO REDUCE FLOODING ALONG WESTERN AVENUE.
- DISTRICT STAFF INITIATED A FEASIBILITY AND DESIGN CONCEPT REPORT WITH STANTEC CONSULTING IN JANUARY 2014.
- BASIN IS DESIGNED TO LOWER THE PEAK DISCHARGE OF THE 100-YEAR EVENT (1% FLOOD) BY APPROXIMATELY 90 PERCENT RESULTING IN FLOWS REMAINING MOSTLY WITHIN THE CHANNEL ALONG WESTERN AVENUE.

Ephraim Detention Basin Area



Legend

SFHA

FLD_ZONE

A

AE

AO

D

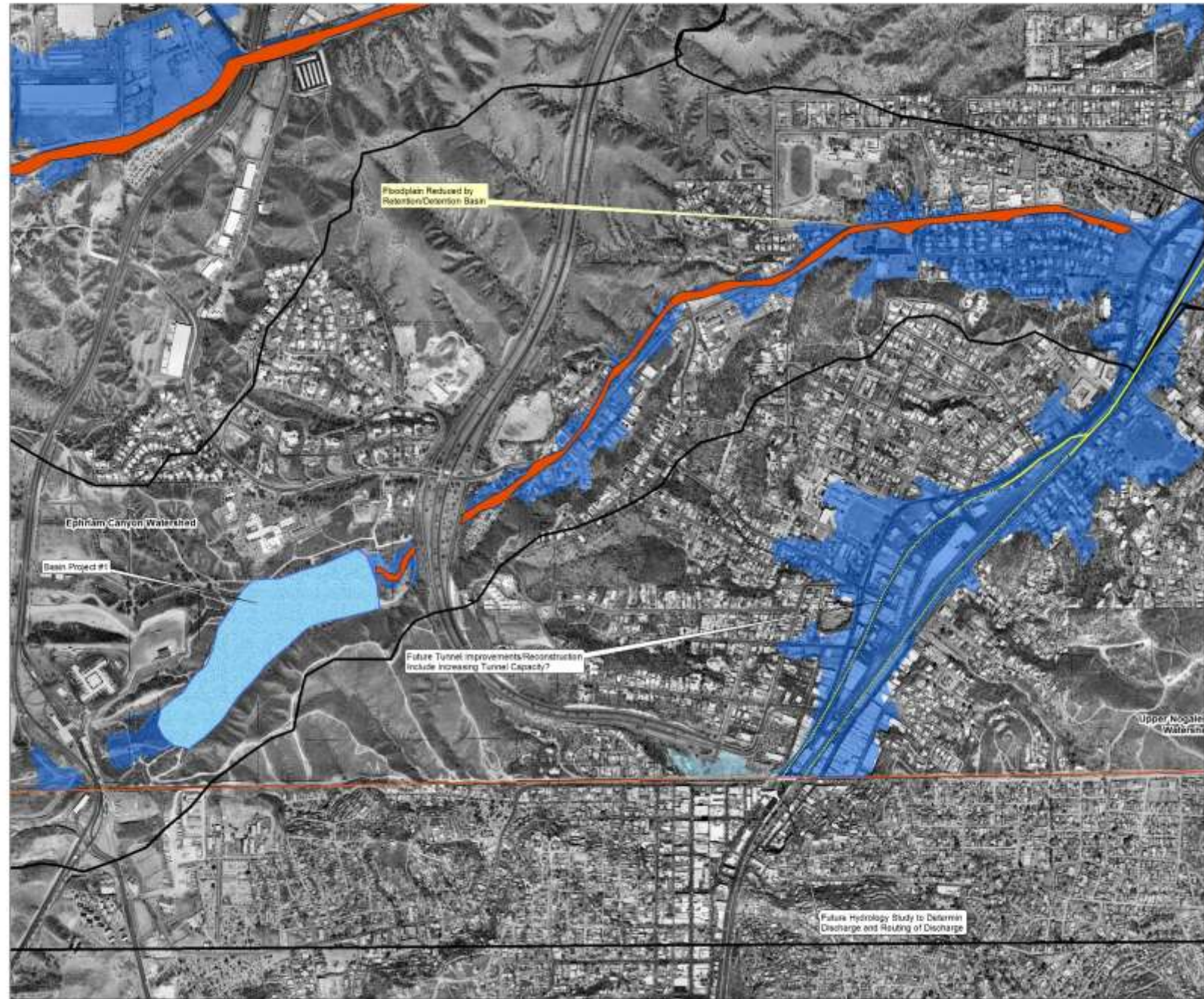
X

X (Shaded)

Town of Patagonia

City of Nogales

Santa Cruz County



1:3,960

0 500 1,000 2,000 3,000 4,000 5,000 Feet

Ephraim Detention Basin Area



Legend

SFHA

FLD_ZONE

A

AE

AO

D

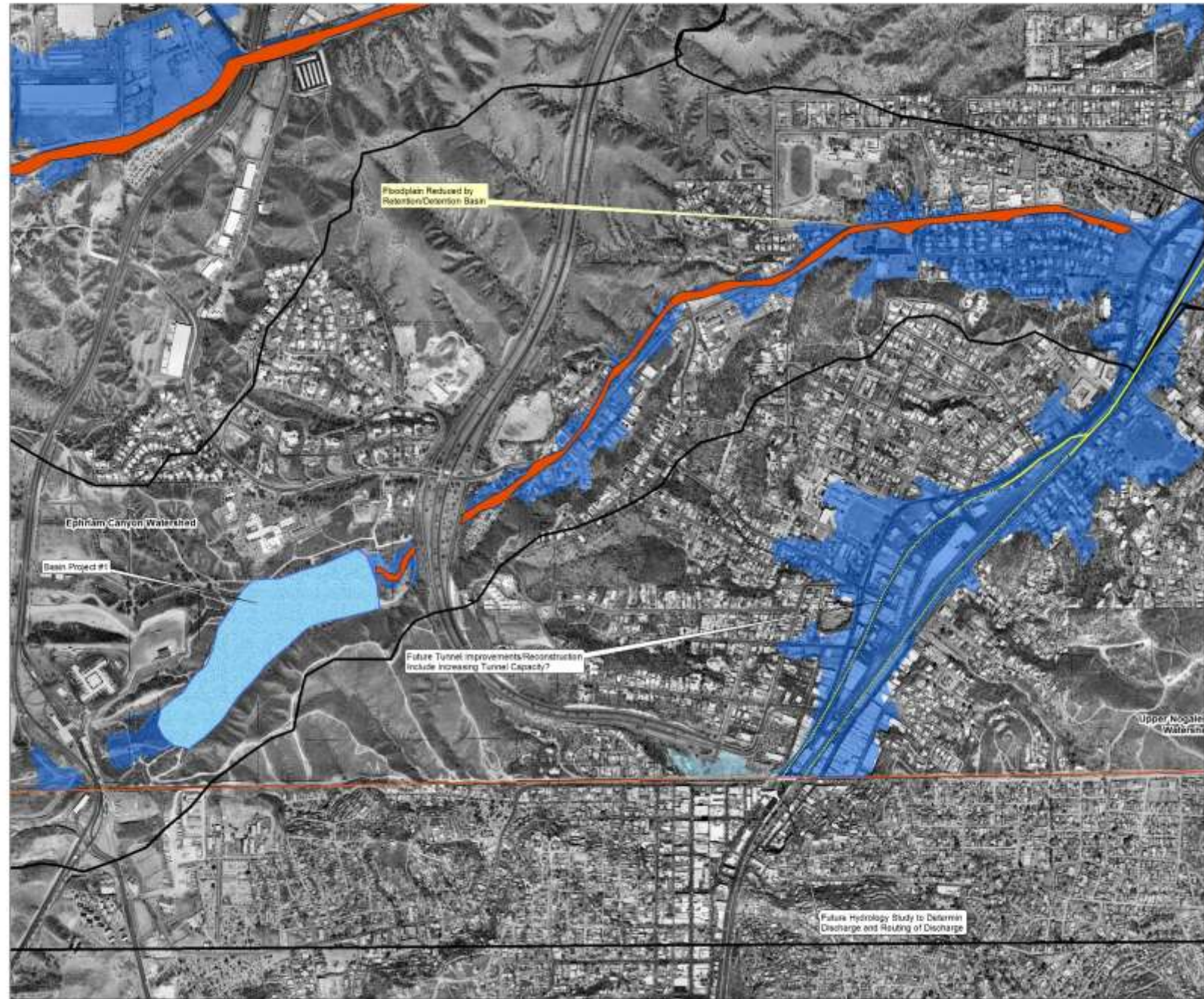
X

X (Shaded)

Town of Patagonia

City of Nogales

Santa Cruz County



1:3,960

0 500 1,000 2,000 3,000 4,000 5,000 Feet

MARIPOSA DETENTION BASIN

- ALONG THE MARIPOSA WASH, NORTHEAST OF MARIPOSA ROAD AND EAST OF LA QUINTA, IS AN OLD BARROW PIT FROM THE CONSTRUCTION OF I-19. THE PIT WOULD MAKE AN IDEAL LOCATION OF A DETENTION BASIN
- DISTRICT STAFF ESTIMATES THAT A LARGE ENOUGH BASIN TO CHANNELIZE FLOWS WITHIN THE MARIPOSA WASH DOWNSTREAM, REMOVING MOST, IF NOT ALL OF THE INDUSTRIAL AND COMMERCIAL AREAS ALONG MARIPOSA ROAD FROM THE FLOODPLAIN.

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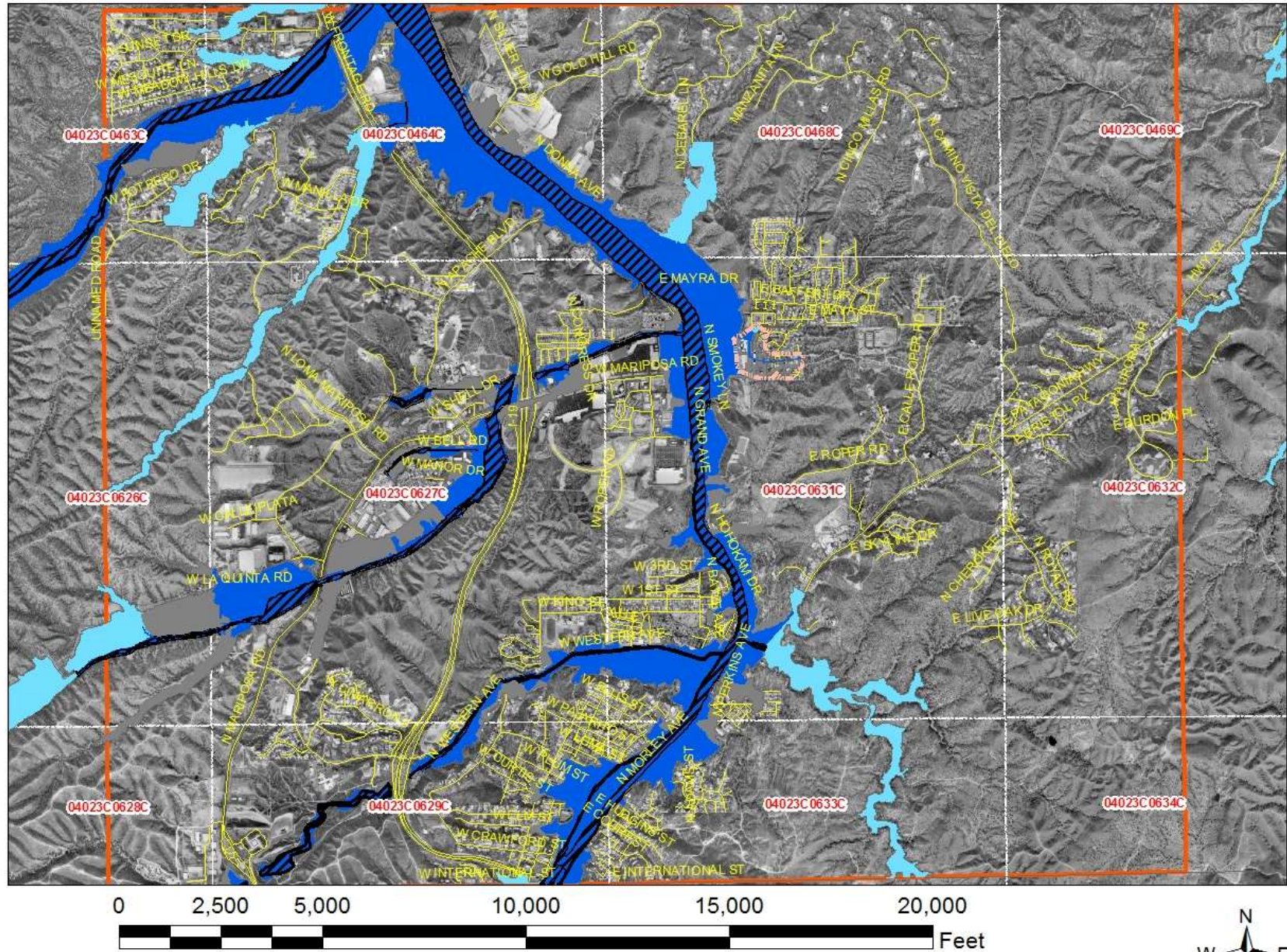
Legend

SFHA

FLD_ZONE, ZONE_SUBTY

-  FLOODWAY
 A_i
 AE_i
 AO_i
 X (Shaded)
 X
 D_i
 DFIRM Panel
 Santa Cruz C
 Roads

Digital Flood Insurance Rate Map - GIS Version



1:30,000

Contour Interval



Mariposa Detention Basin Area



Legend

SFHA

FLD_ZONE

A

AE

AO

D

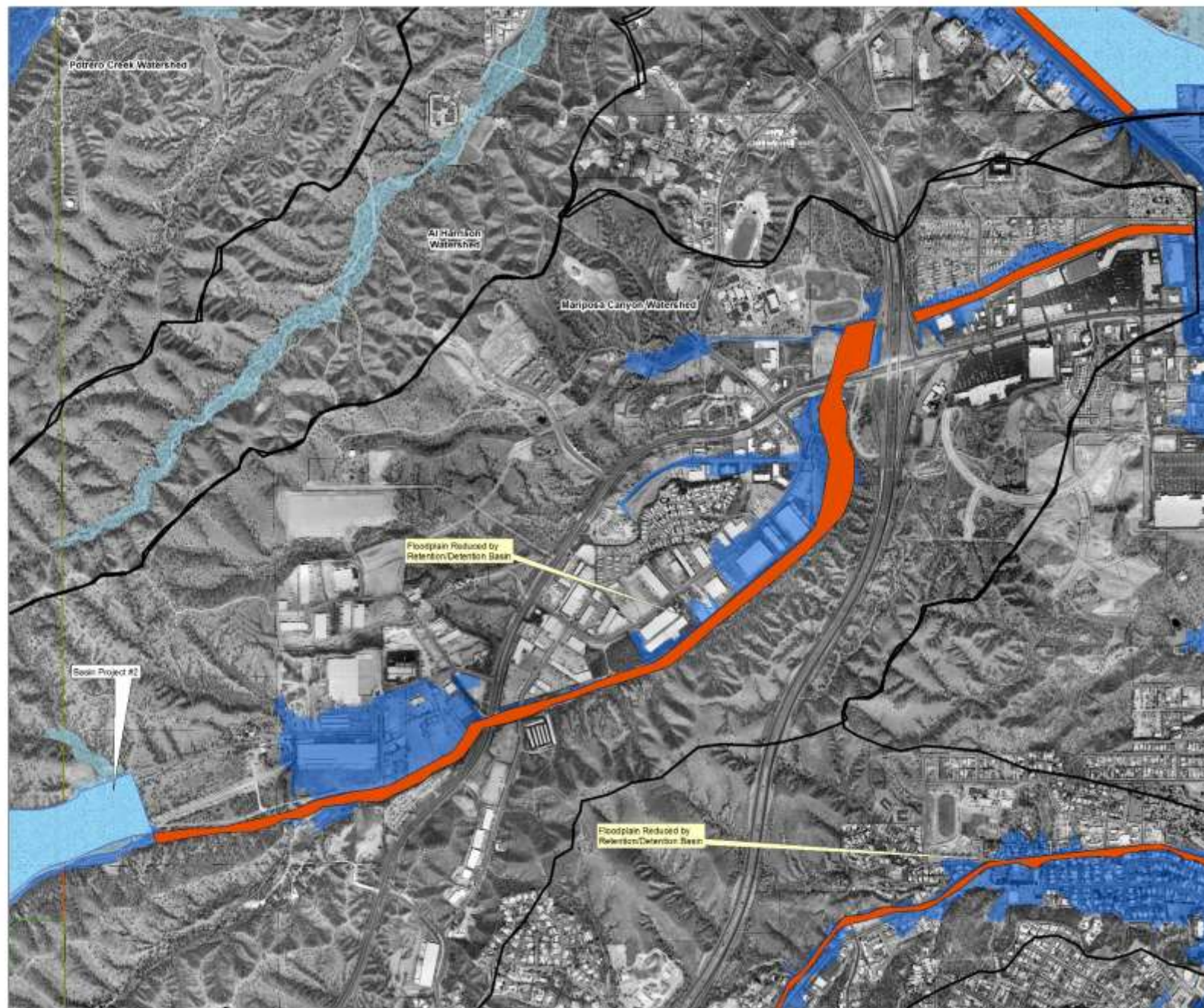
X

X (Shaded)

Town of Patagonia

City of Nogales

Santa Cruz County



14,800

0 500 1,000 1,500 2,000 2,500 3,000 3,500 4,000 4,500 5,000 Feet

BAFFERT DETENTION BASIN

- NORTH OF BAFFERT DRIVE IS A LARGE (40+ ACRE) AREA OF AGRICULTURAL LAND ALONG THE CHANNEL OF THE NOGALES WASH. THE AREA WOULD MAKE AN IDEAL LOCATION FOR A DETENTION BASIN ALONG THE NOGALES WASH
- DISTRICT STAFF DID A FEASIBILITY STUDY WITH STANTEC CONSULTING TO SEE WHAT THE EFFECTS OF THE LARGEST POSSIBLE BASIN WITHIN THE FLAT PORTION OF THE PROPERTY WOULD BE. THE RESULT OF THE STUDY SUGGESTS THAT IF BOTH THE EPHRIAM AND MARIPOSA BASINS WERE CONSTRUCTED, THE RESULT F THIS BASIN WOULD BE TO KEEP THE 100-YEAR (1%) FLOOD EVENT CONFINED TO THE CHANNEL OF THE NOGALES WASH FROM BAFFERT DRIVE DOWNSTREAM.

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Legend

SFHA

FLD_ZONE, ZONE_SUBTY

FLOODWAY

A₁

AE₁

AO₁

X (Shaded)

X

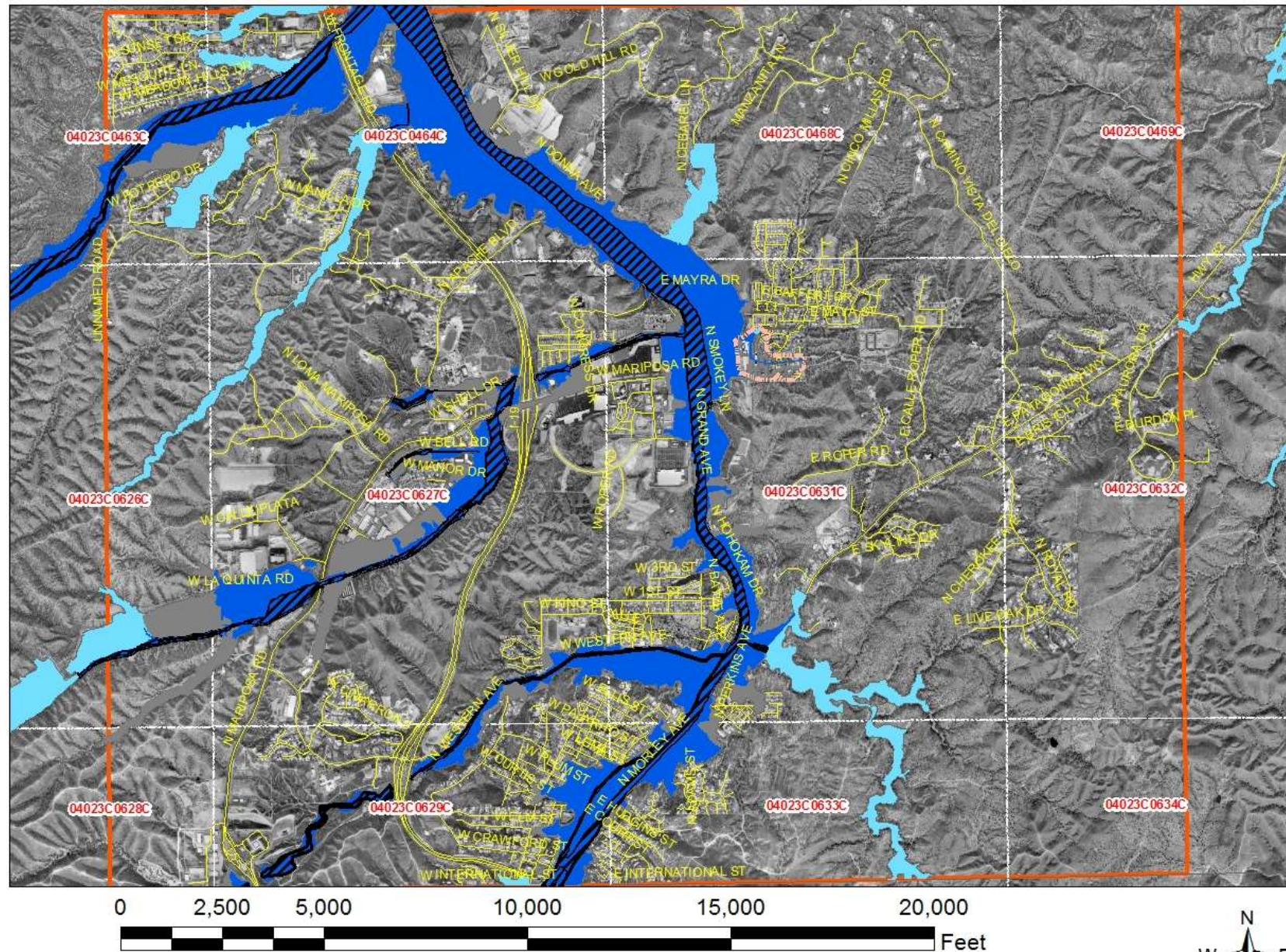
D₁

DFIRM Panels

Santa Cruz County

Roads

Digital Flood Insurance Rate Map - GIS Version



1:30,000

Contour Interval

Mariposa Detention Basin Area



Legend

SFHA

FLD_ZONE

A

AE

AO

D

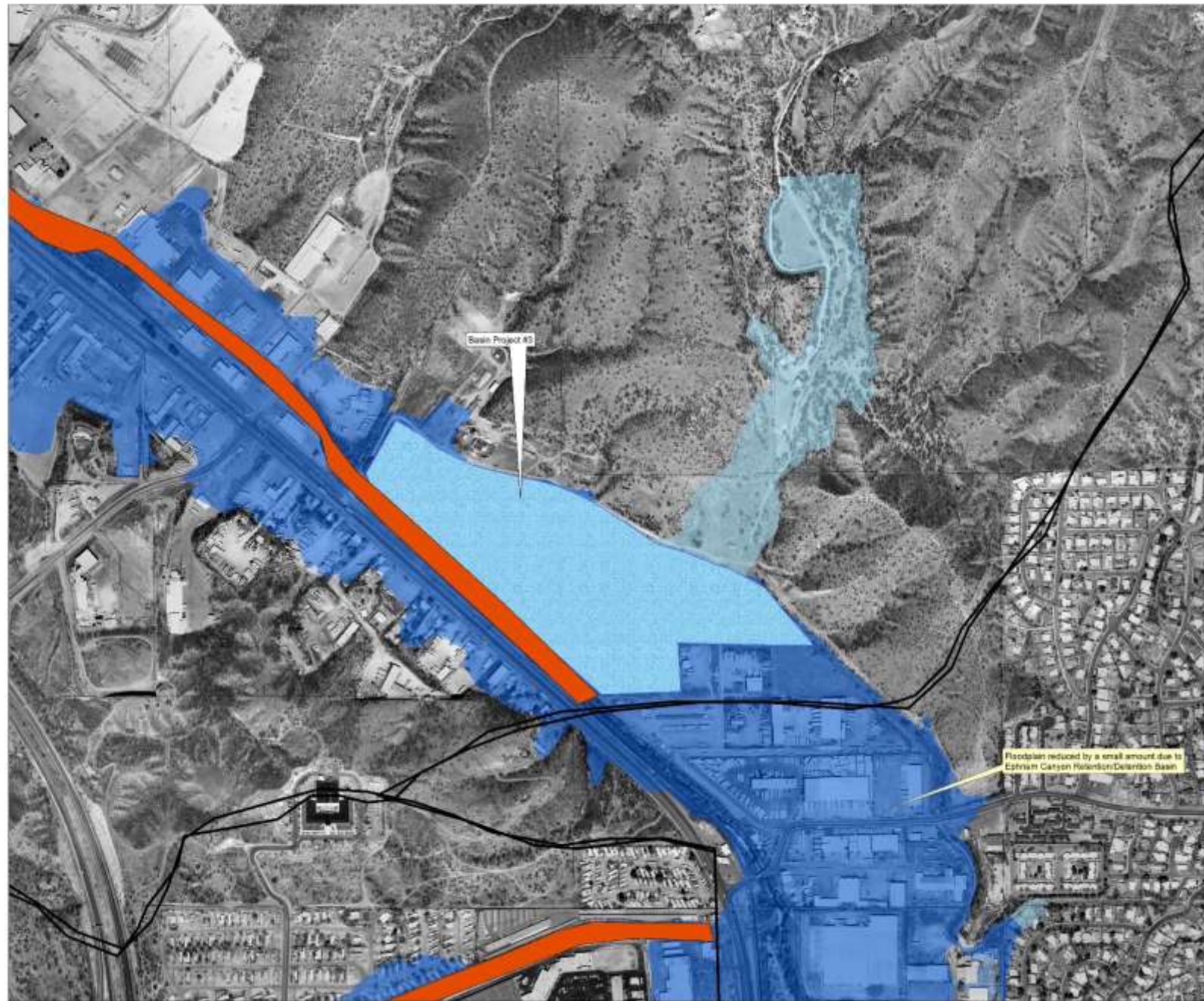
X

X (Shaded)

Town of Patagonia

City of Nogales

Santa Cruz County



1:2,400

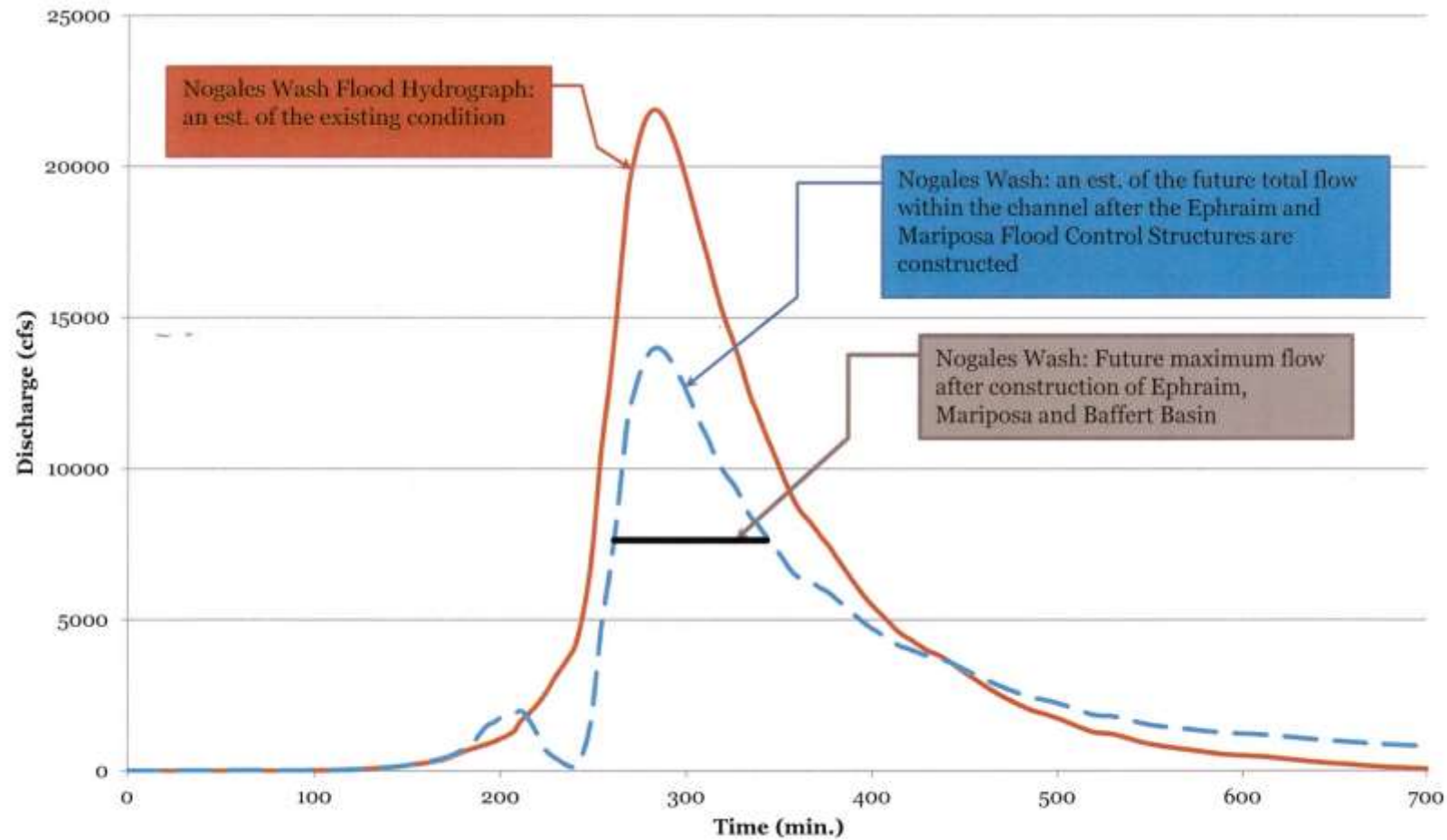
0 400 800 1,600 2,400 3,200 Feet

A Preliminary Examination of the Effect of the Reduction in the Peak Discharge within Nogales Wash due to
Flood Control Structures developed within: Ephraim Canyon, Mariposa Canyon and Baffert Basin
During the Standard Flood Event: 100-Year

Santa Cruz County Flood Control District

Prepared by: Stantec Consulting Service Inc.

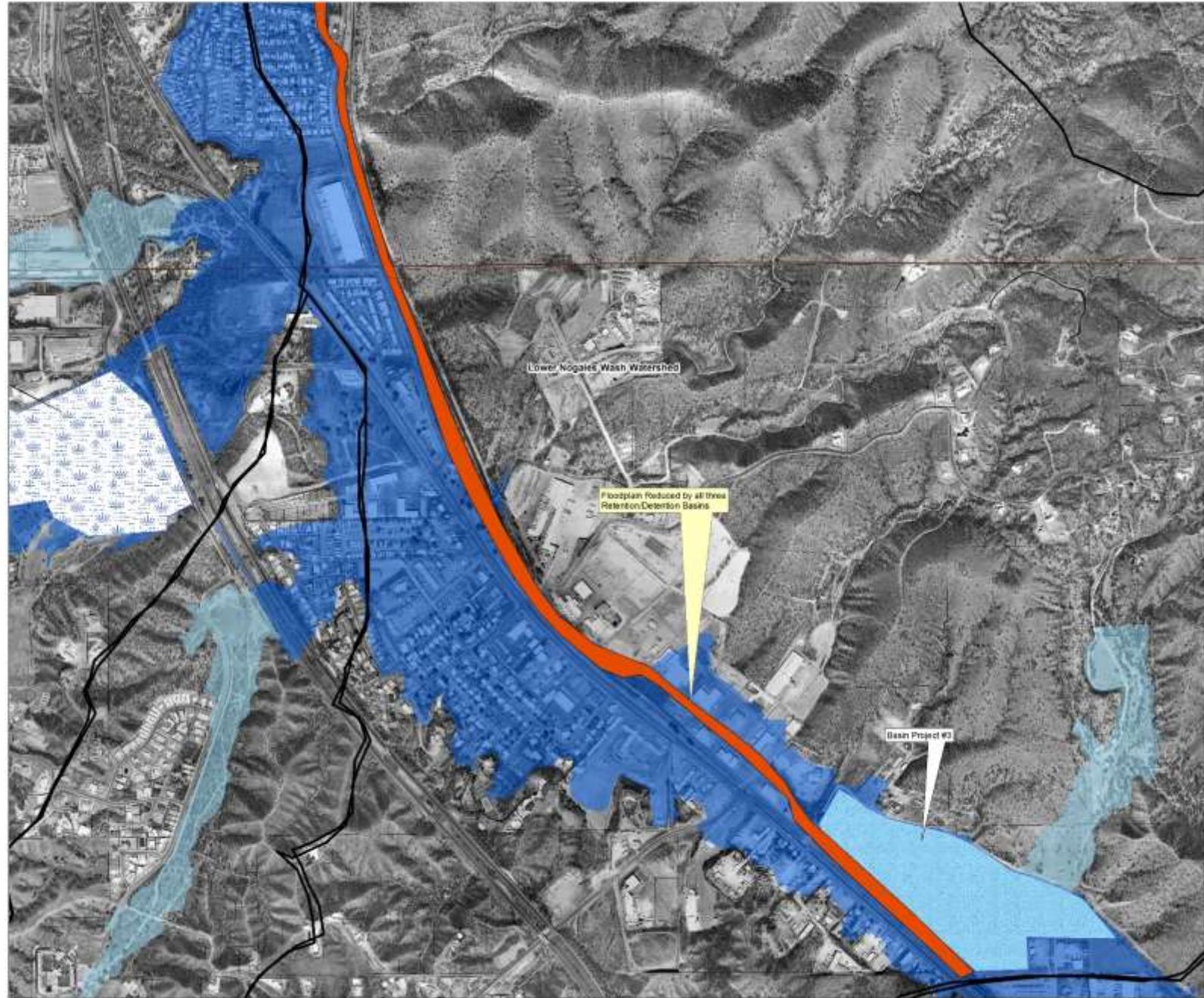
March 16, 2015



Mariposa Detention Basin Area



- Legend**
- SFHA**
- FLD_ZONE**
- A
 - AE
 - AO
 - D
 - X
 - X (Shaded)
 - Town of Patagonia
 - City of Nogales
 - Santa Cruz County



1:3,600

0 400 800 1,600 3,200 6,400 Feet

BAFFERT DETENTION BASIN

- DESIGN FEATURES TO BETTER SERVE THE CITY OF NOGALES ARE BEING CONSIDERED FOR THE BASIN:
 - TRASH RACK TO HELP REMOVE DEBRIS AND TRASH FROM THE FLOWS OF THE NOGALES WASH AS THEY ENTER THE BASIN.
 - UPPER (SOUTH) END OF THE BASIN WOULD BE ABLE TO HAVE SOCCER, BASEBALL, AND/OR SOFTBALL FIELDS, MUCH LIKE ARE PRESENT IN THE KINO ENVIRONMENTAL RESTORATION PROJECT IN THE CITY OF TUCSON

POTRERO CREEK HABITAT RESTORATION

- STAFF OF THE SANTA CRUZ COUNTY FLOOD CONTROL DISTRICT HAVE PROPOSED ATTEMPTING TO HELP MITIGATE FLOODING IN CHULA VISTA AND PETE KITCHEN AREAS, JUST NORTH OF THE CITY OF NOGALES, FROM THE POTRERO CREEK BY RE-ESTABLISHING THE WET LANDS UPSTREAM OF I-19 THAT EXISTED PRIOR TO THE CONSTRUCTION OF THE PALO DURO GOLF COURSE IN THE EARLY 1960'S.

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Digital Flood Insurance Rate Map - GIS Version

Legend

-  Letter of Map Amendment (LOMA)
-  Floodplain Use Permit
-  Site Review
-  Flood Hazard Information Sheet
-  Calculated Base Flood Elevations
-  100 Year Discharge Estimates
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0 500 1,000 2,000 3,000 4,000 Feet

1:6,000

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0 500 1,000 2,000 3,000 4,000 Feet

1:6,000

Contour Interval



DOWNTOWN NOGALES

- DOWNTOWN NOGALES IS PERHAPS THE MOST VULNERABLE AREA FOR FLOODING WITHIN THE CITY, AND THE HARDEST TO SOLVE.
- FLOOD FLOWS ORIGINATE IN MEXICO, WHERE THE DISTRICT HAS NO CONTROL OR LEGAL AUTHORITY TO CAUSE ANY PHYSICAL PROJECTS TO OCCUR
- DISTRICT STAFF HAVE DEVELOPED A COUPLE OF POSSIBLE PROJECTS TO TRY TO HELP THE AREA

DOWNTOWN NOGALES HYDROLOGY STUDY

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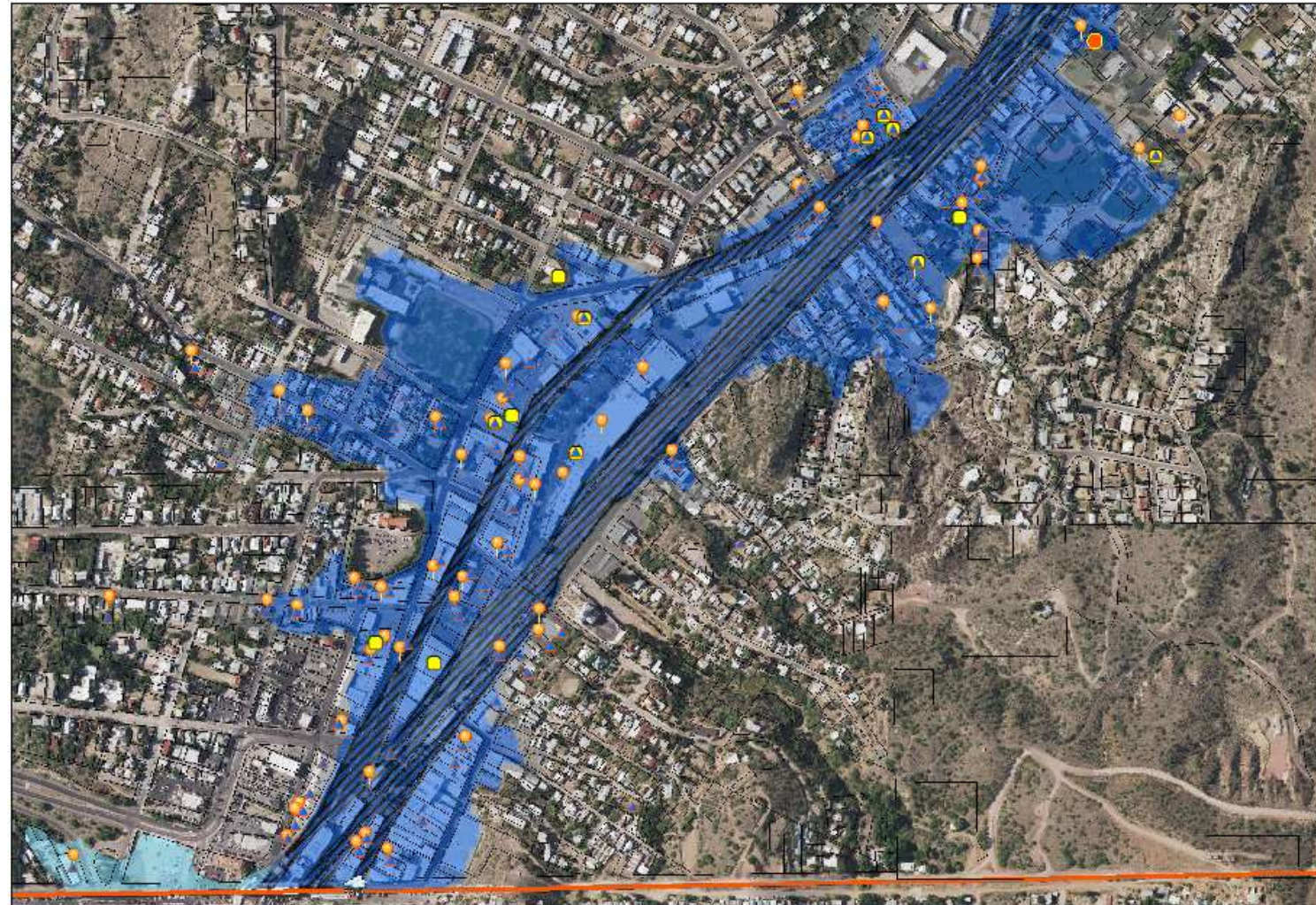
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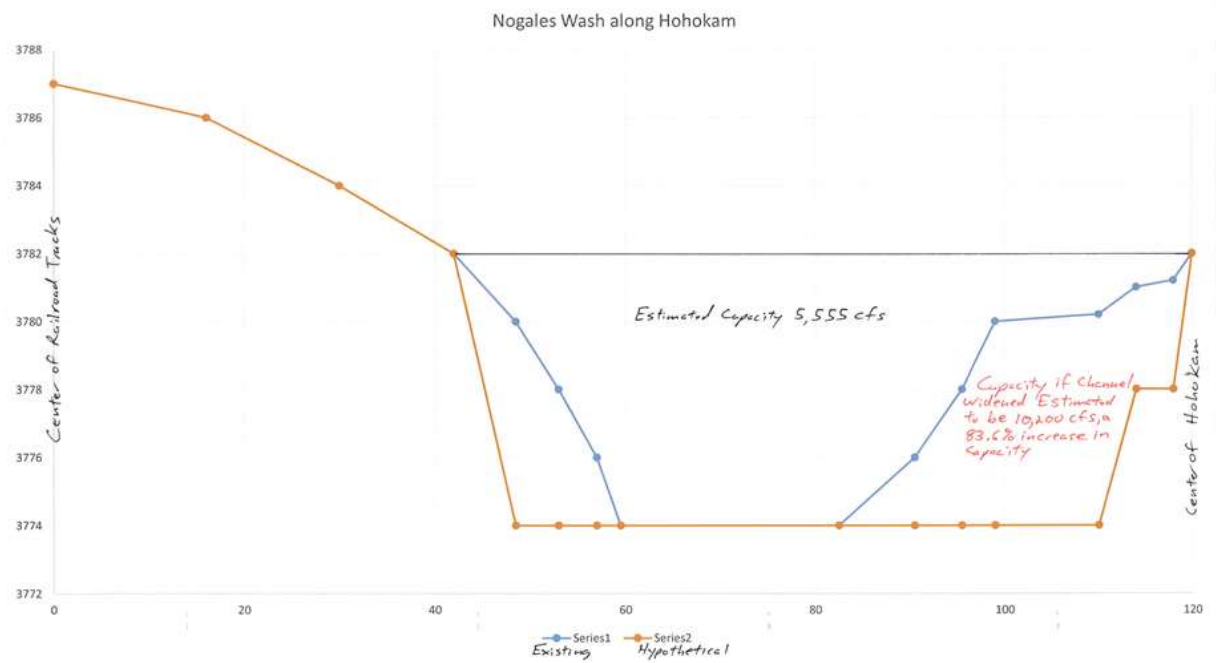
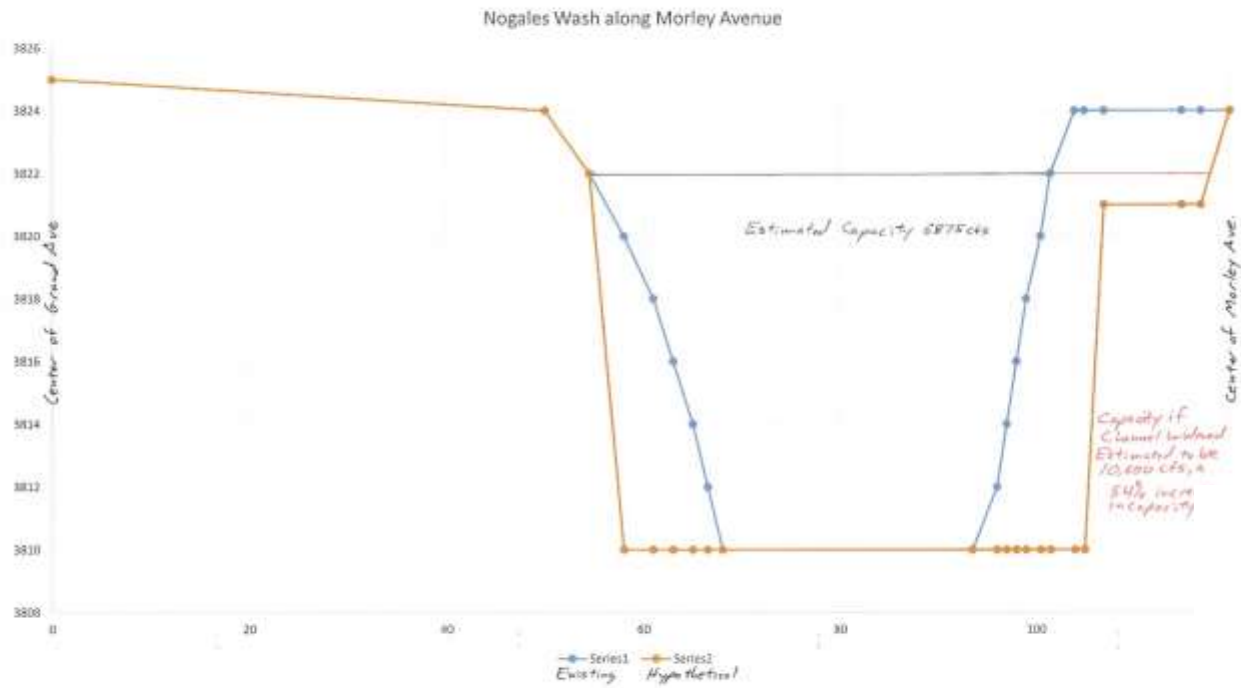
0 500 1,000 2,000 3,000 4,000 Feet

1:6,000

Contour Interval







UNDERGROUND TUNNEL IMPROVEMENTS

- INCREASING THE CAPACITY OF THE UNDERGROUND TUNNELS AND PROVIDING UNDERGROUND STORAGE CAPACITY COULD ALSO POTENTIALLY DECREASE THE FLOODPLAIN WITHIN THE DOWNTOWN AREA.
- GIVEN THE ISSUES WITH BORDER TUNNELS AND CONCERNS ABOUT THE STABILITY OF THE EXISTING ABOVE GROUND STRUCTURES, THIS MAY NOT BE A REASONABLE APPROACH.

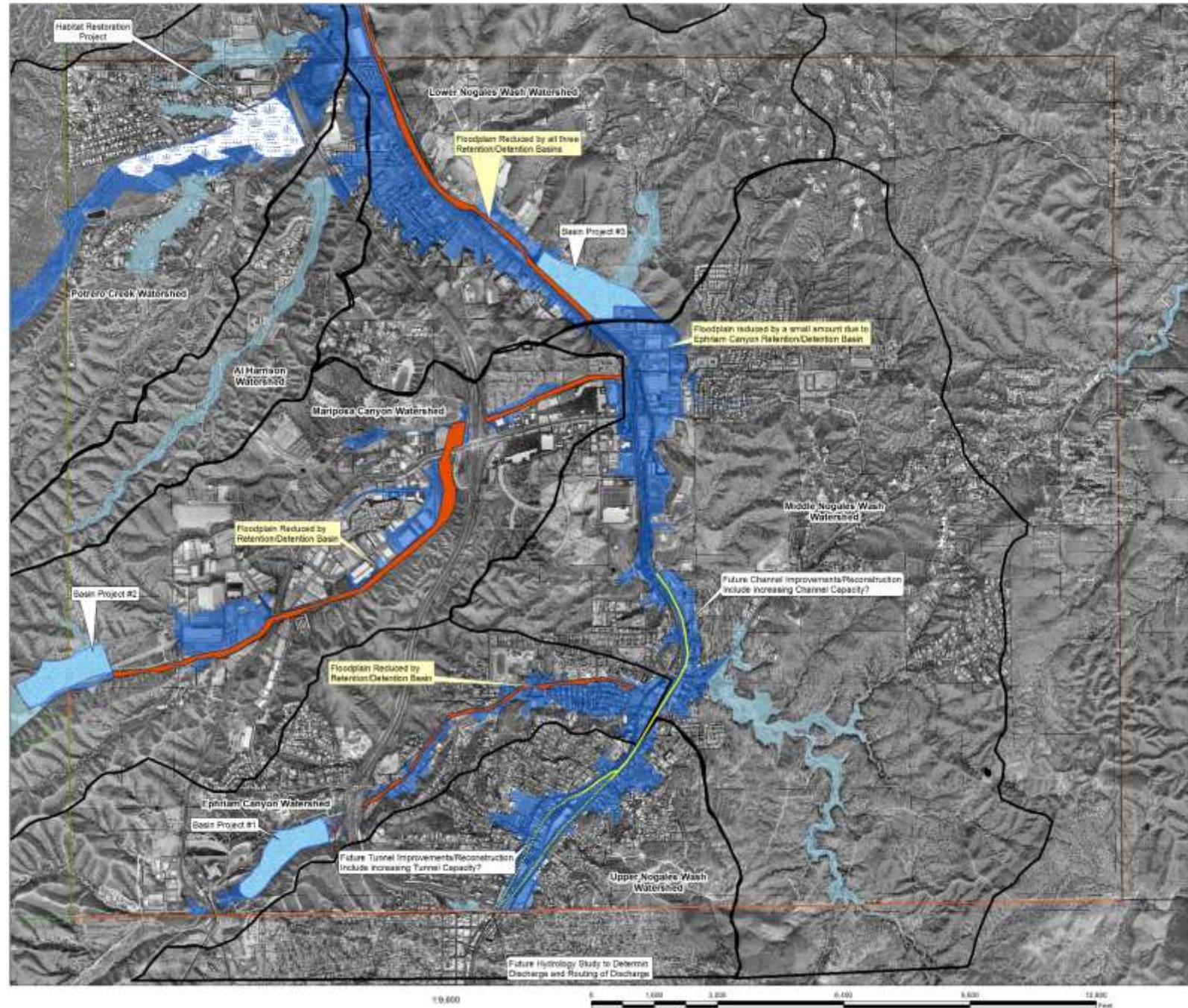
TOTAL RETROFIT OF DOWNTOWN

- COMPLETE STRUCTURAL RETROFIT/RECONSTRUCTION OF ALL DOWNTOWN BUILDINGS, ELEVATING EVERY STRUCTURE BY UP TO 10 FEET – EXTREMELY EXPENSIVE, AND WOULD REQUIRE THE PROPERTY OWNERS TO BUY IN. THE IDEA WOULD BE TO POSSIBLY TURN THE FIRST FLOOR OF THE EXISTING STRUCTURES INTO COVERED PARKING AND MOVING THE STORES AND BUSINESSES UP TO THE SECOND FLOOR. ALSO IN THE CONSIDERATION WOULD BE A SKYWALK TO ALLOW MOVEMENT BETWEEN STORES WITHOUT HAVING TO GO UP AND DOWN STAIRS TO ACCESS THE NEIGHBORING STORE, AND TO CONNECT DIFFERENT PARTS OF DOWNTOWN, PROVIDING A GRADE SEPARATION BETWEEN PEDESTRIAN TRAFFIC AND THE RAILROAD.
- THE DISTRICT IS CONSIDERING THE POSSIBILITY OF A DEMONSTRATION PROJECT DOWNTOWN TO SHOW THAT THIS TYPE OF WORK COULD BE DONE, AND FIT WITH THE AESTHETICS DESIRED FOR THE DOWNTOWN AREA.

Possible Effects on Floodplains in the City of Nogales by Proposed Projects.



- Legend**
- SFHA**
- FLD_ZONE**
- A
 - AE
 - AO
 - D
 - X
 - X (Shaded)
 - Town of Patagonia
 - City of Nogales
 - Santa Cruz County



NOGALES WASH/POTRERO CREEK CHANNELIZATION AND RIVER PARK

- DUE TO CHANGES IN THE BEHAVIOR OF THE CHANNEL SYSTEM, SWITCHING FROM DEGRADATIONAL TO LATERAL WIDENING, DISTRICT STAFF IS INVESTIGATING WHAT CAN BE DONE TO WORK WITH THE CHANNEL SYSTEM TO MITIGATE FUTURE LATERAL MIGRATIONS THROUGH CHANNEL WIDENING AND ARMAMENT, AND COMBINING A PEDESTRIAN AND BICYCLE PATH WITH THE CONSTRUCTION AND MAINTENANCE ACCESS ROAD.

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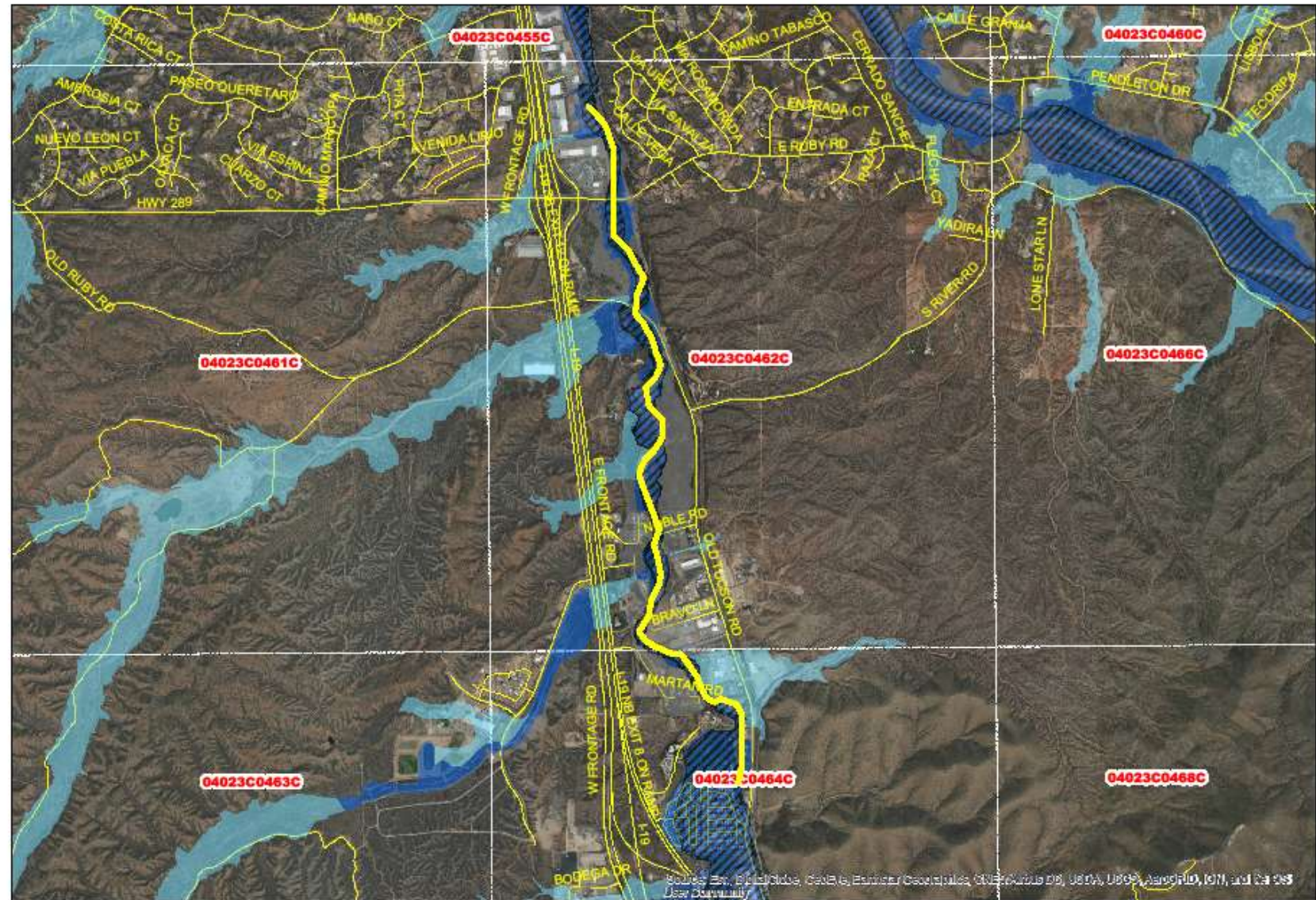
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-  Santa Cruz County
-  Roads

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0 2,000 4,000 8,000 12,000 16,000 Feet

1:24,000

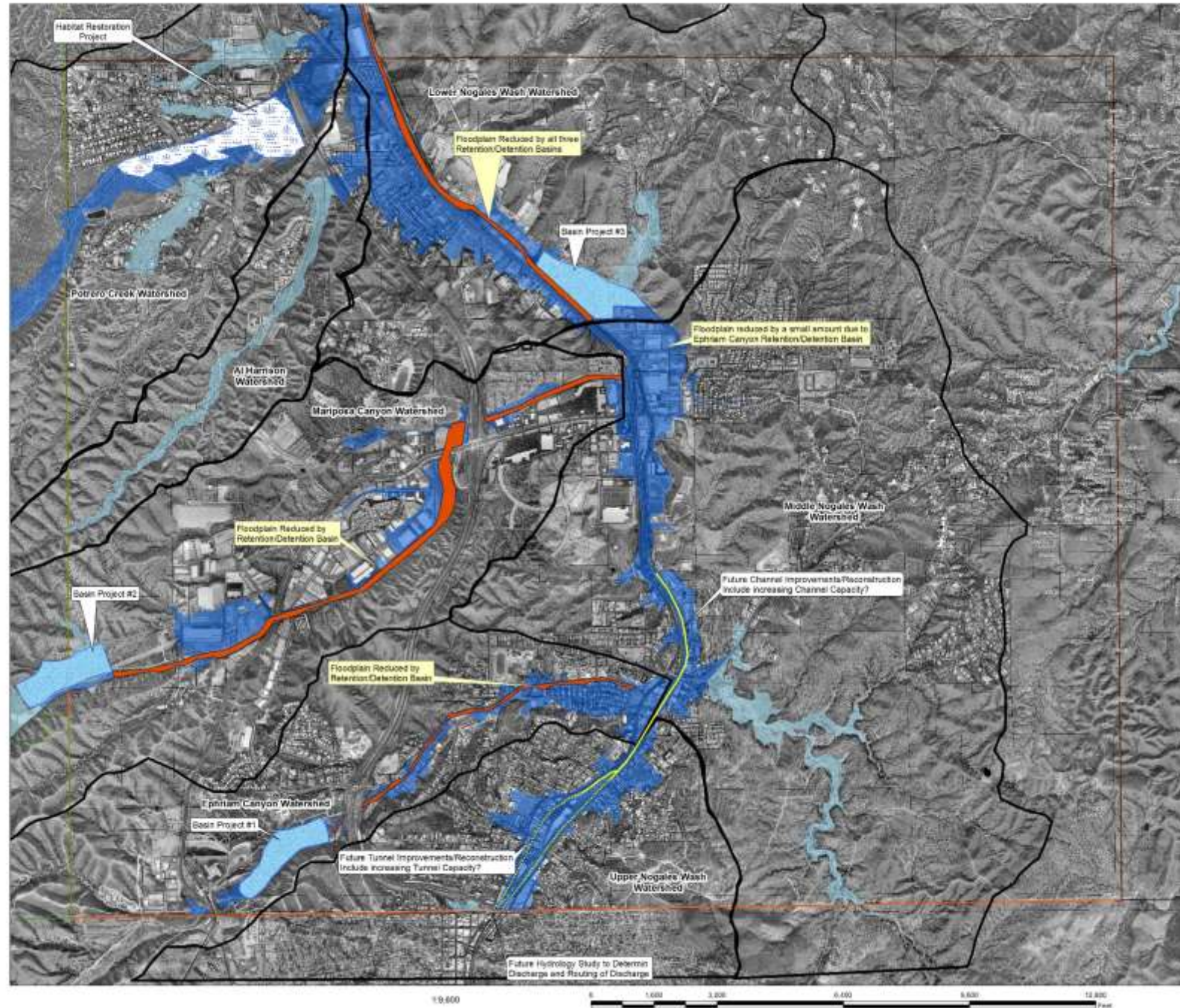
Contour Interval



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- Legend**
- SFHA**
- FLD_ZONE**
- A
 - AE
 - AO
 - D
 - X
 - X (Shaded)
 - Town of Patagonia
 - City of Nogales
 - Santa Cruz County



QUESTIONS?

