

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA**



**WATERMAN WASH AND TRIBUTARIES
FLOODPLAIN DELINEATION STUDY
FCD 2002C024**

EXHIBITS AND MAPS

Book 5 of 5

Prepared by:



**Engineering and Environmental Consultants, Inc.
3003 North Central, Suite 600
Phoenix, Arizona 85012-2905
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FAX: (602) 248-7851**

March 2006

**FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA**

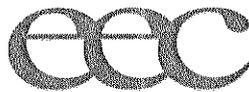


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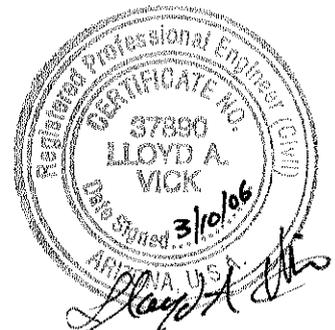
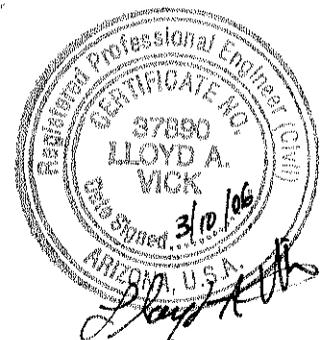


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Flood Control District of Maricopa County Waterman Wash FDS

FCD 2002C024

Exhibit 1 Waterman Wash FDS Soils Map

Prepared by EEC, Inc
April 19, 2004

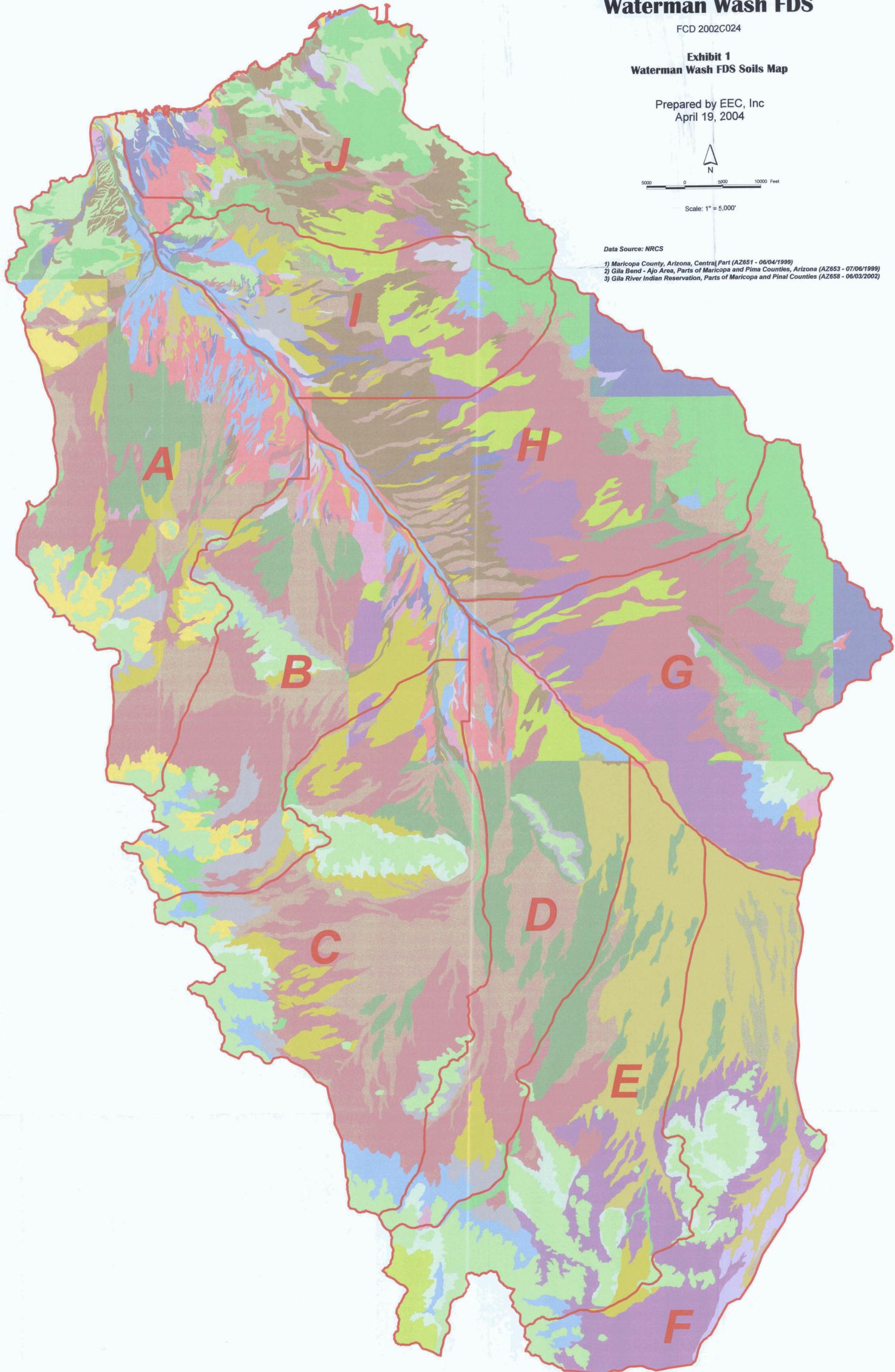


Scale: 1" = 5,000'

Data Source: NRCS

- 1) Maricopa County, Arizona, Central Part (AZ651 - 06/04/1999)
- 2) Gila Bend - Ajo Area, Parts of Maricopa and Pinal Counties, Arizona (AZ653 - 07/06/1999)
- 3) Gila River Indian Reservation, Parts of Maricopa and Pinal Counties (AZ658 - 06/03/2002)

Soil Unit
10
11
14
20
21
22
24
27
32
36
37
46
47
48
49
5
51
53
54
58
6
66
67
9
AGB
AL
AM
Aa
AbA
AbB
Ac
AdA
AdB
Ae
AfA
Br
Bs
CA2
CF
CO
CV
Cb
Cg
Ch
Cp
CrB
Cs
EPD
Es
Et
GA
GM
GN
GWD
GVD
Ge
GgA
GgB
Gh
Go3
Gp
Gr
GxA
GxB
HAB
HLC
HM
HrB
Lb
LcA
Ld
MV
Ma
Mo
Mp
PRB
PT
PYD
Pa
PeA
PeB
PsA
PsB
RS
RbA
RbB
TB
TD
TPB
TSC
Te
TfA
TfB
TrA
TrB
Tu
Va
Vb
Ve
Vf
Vg
Vh



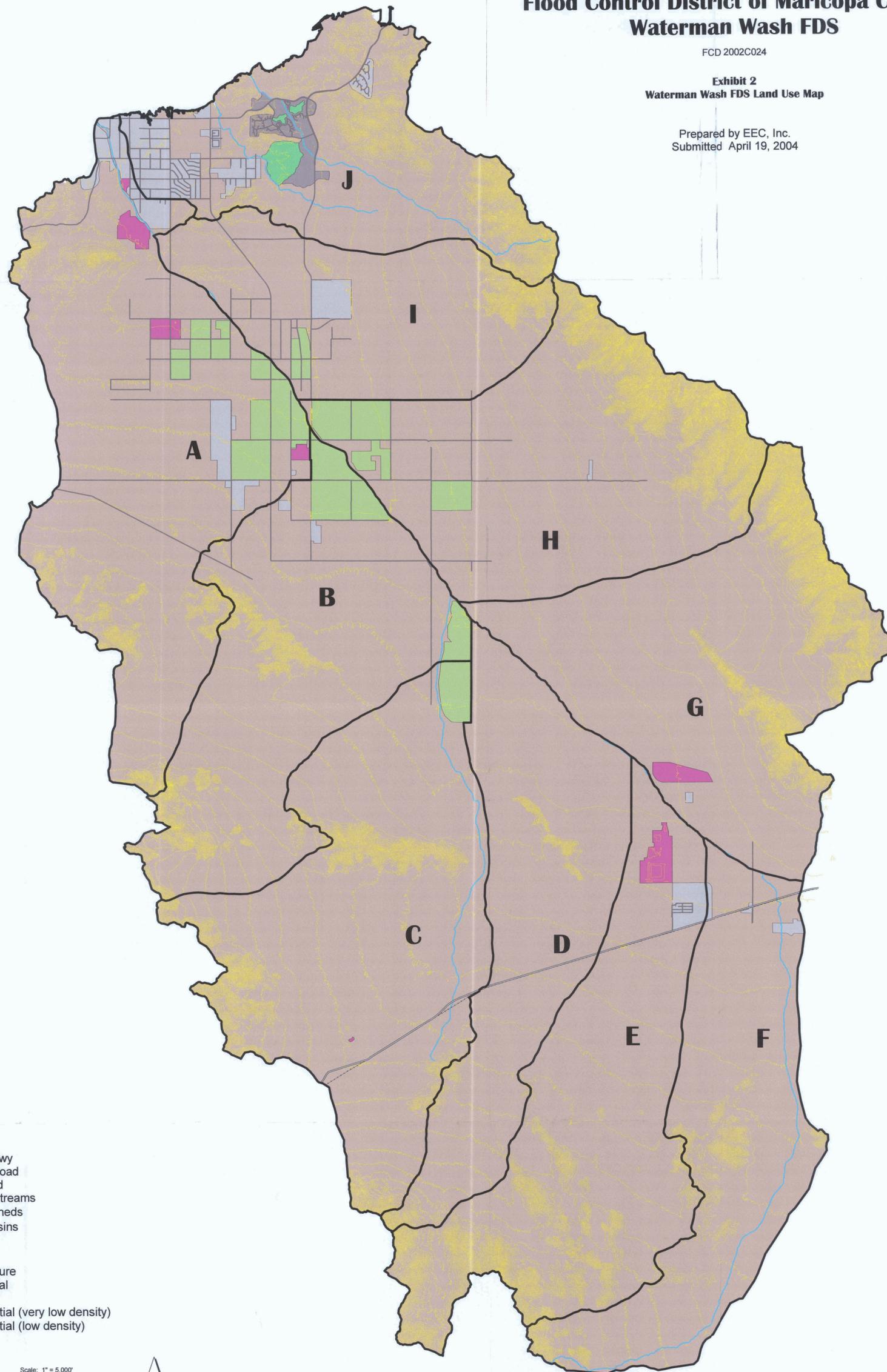


Flood Control District of Maricopa County Waterman Wash FDS

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Exhibit 2 Waterman Wash FDS Land Use Map

Prepared by EEC, Inc.
Submitted April 19, 2004



- State Hwy
- Local Road
- Railroad
- Major Streams
- Watersheds
- Sub-basins

- desert
- agriculture
- industrial
- park
- residential (very low density)
- residential (low density)

Scale: 1" = 5,000'

5000 0 5000 10000 Feet



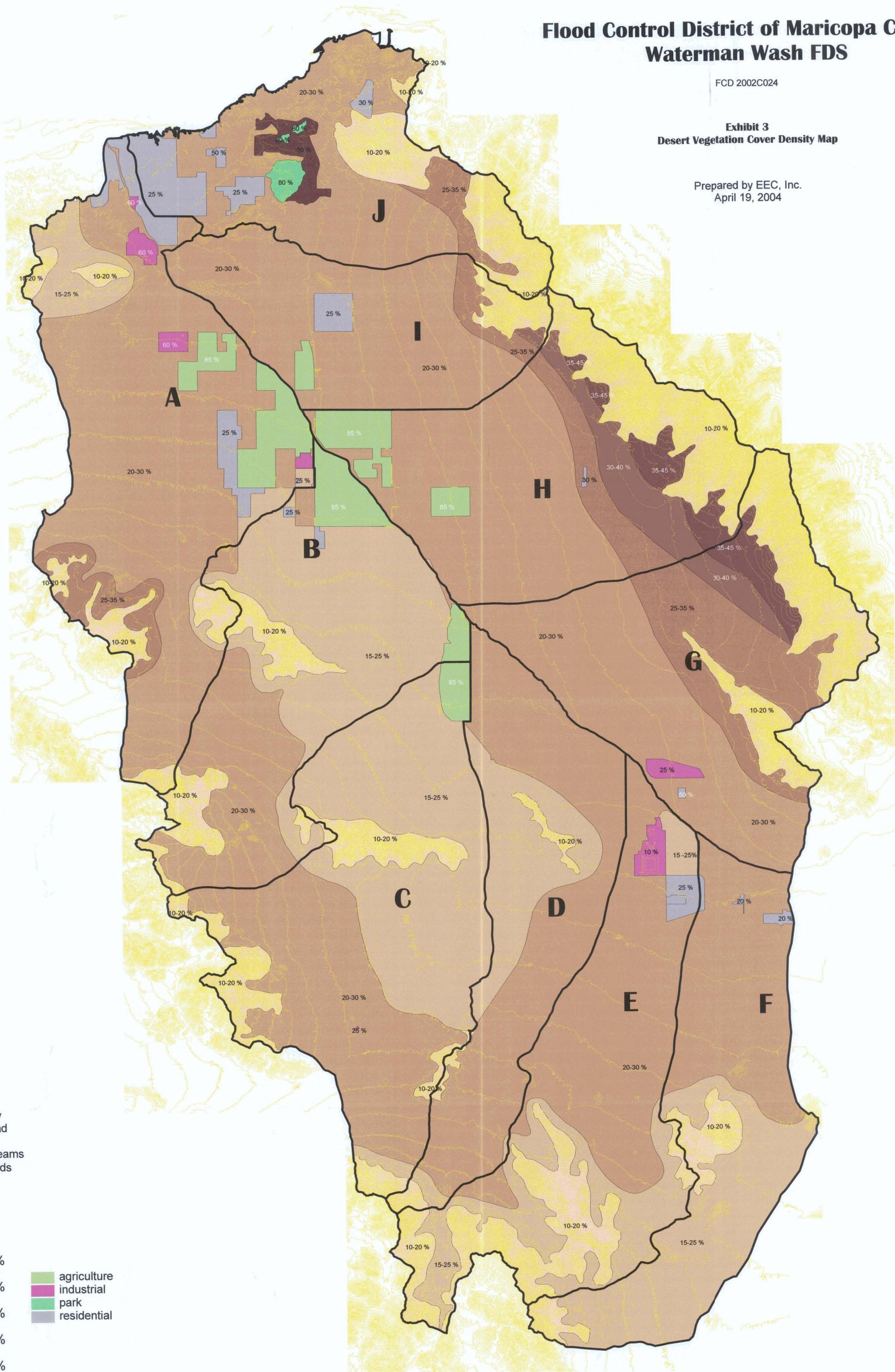


Flood Control District of Maricopa County Waterman Wash FDS

FCD 2002C024

Exhibit 3 Desert Vegetation Cover Density Map

Prepared by EEC, Inc.
April 19, 2004

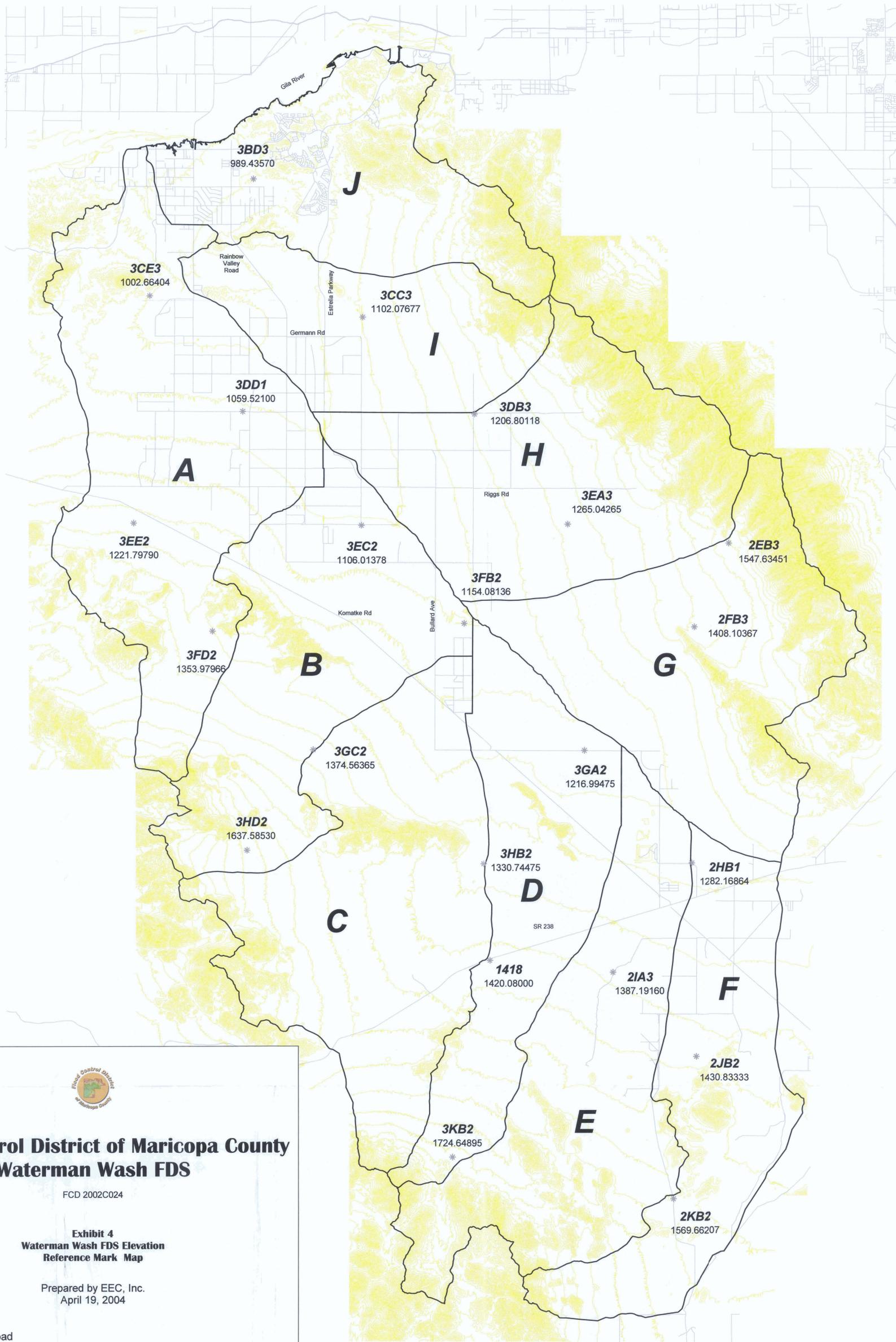


- State Hwy
- Local Road
- Railroad
- Major Streams
- Watersheds

- Desert Vegetation Cover
- 10-20%
 - 15-25%
 - 20-30%
 - 25-35%
 - 30-40%
 - 35-45%
- agriculture
 - industrial
 - park
 - residential

Scale: 1" = 5,000'
5000 0 5000 10000 Feet





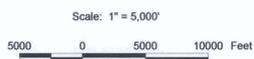
Flood Control District of Maricopa County Waterman Wash FDS

FCD 2002C024

Exhibit 4 Waterman Wash FDS Elevation Reference Mark Map

Prepared by EEC, Inc.
April 19, 2004

- Local Road
- 50' Elevation Contour
- Watersheds
- GDAC Point
(NAVD88 Datum)





Flood Control District of Maricopa County Waterman Wash FDS

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Exhibit 5. N-Value Map

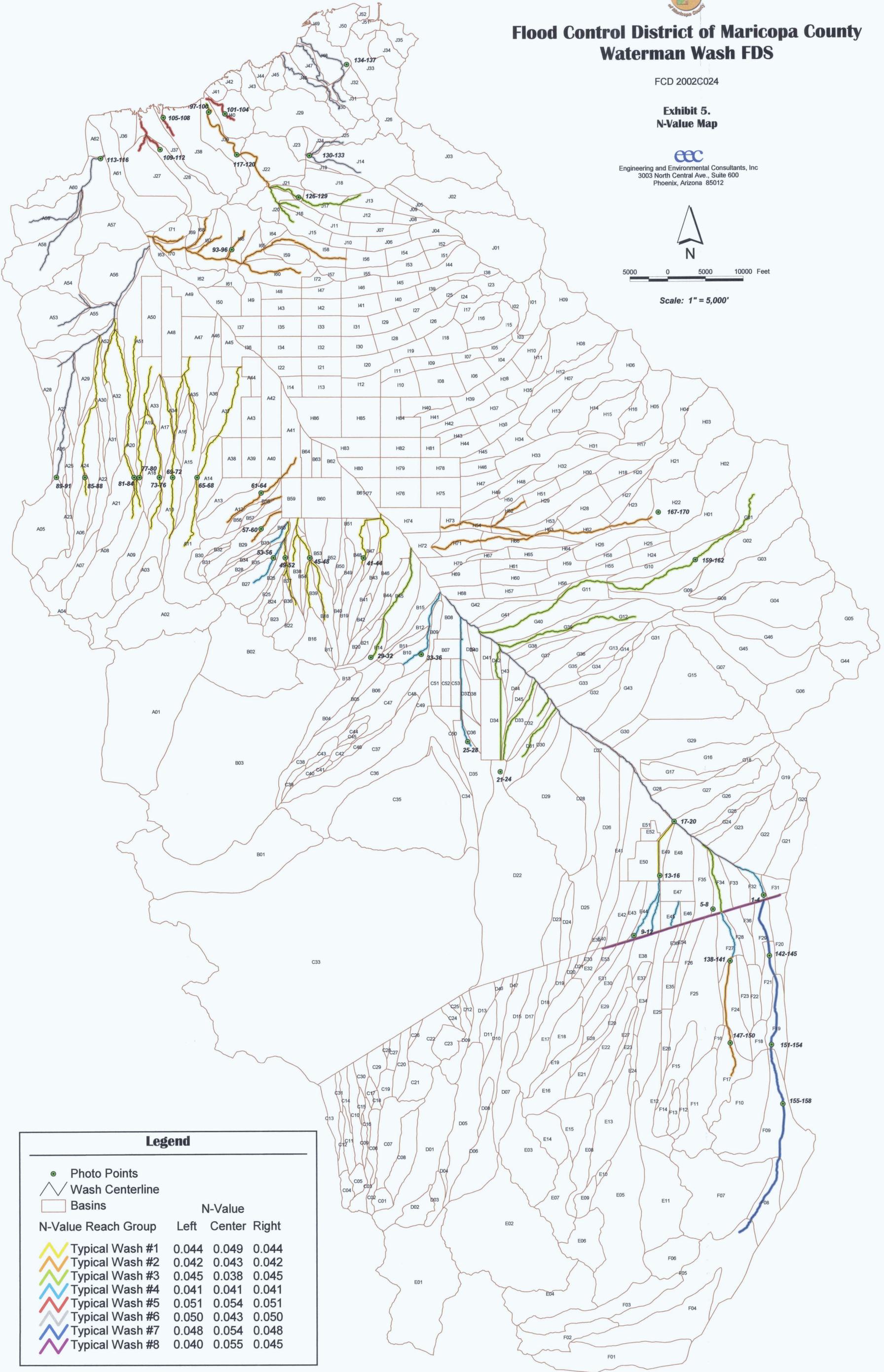


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3003 North Central Ave., Suite 600
Phoenix, Arizona 85012



5000 0 5000 10000 Feet

Scale: 1" = 5,000'



Legend

- Photo Points
- Wash Centerline
- Basins

N-Value Reach Group	N-Value		
	Left	Center	Right
Typical Wash #1	0.044	0.049	0.044
Typical Wash #2	0.042	0.043	0.042
Typical Wash #3	0.045	0.038	0.045
Typical Wash #4	0.041	0.041	0.041
Typical Wash #5	0.051	0.054	0.051
Typical Wash #6	0.050	0.043	0.050
Typical Wash #7	0.048	0.054	0.048
Typical Wash #8	0.040	0.055	0.045

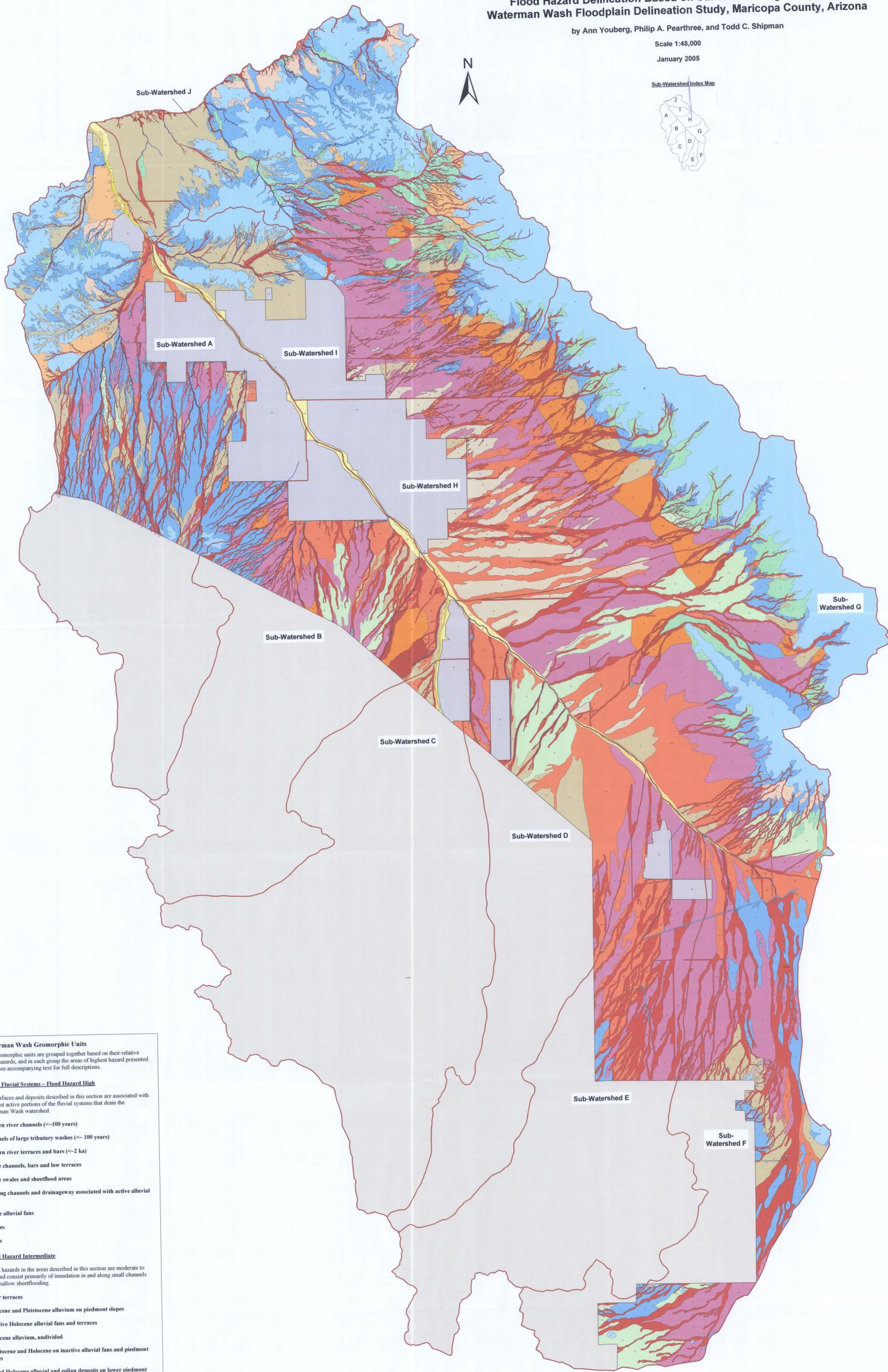
Flood Hazard Delineation Based on Surficial Geologic Mapping, Waterman Wash Floodplain Delineation Study, Maricopa County, Arizona

by Ann Youberg, Philip A. Pearthree, and Todd C. Shipman

Scale 1:48,000

January 2005

Sub-Watershed Index Map



Waterman Wash Geomorphic Units

Geomorphic units are grouped together based on their relative flood hazards, and in each group the areas of highest hazard presented first. See accompanying text for full descriptions.

Active Fluvial Systems – Flood Hazard High

The surfaces and deposits described in this section are associated with the most active portions of the fluvial systems that drain the Waterman Wash watershed.

- Ycr** Modern river channels (<100 years)
- Yc** Channels of large tributary washes (<100 years)
- Yr** Modern river terraces and bars (<2 ka)
- Yab** Active channels, bars and low terraces
- Ysb** Active swales and sheetflood areas
- Ydb** Existing channels and drainageway associated with active alluvial fans
- Yf** Active alluvial fans
- dt** Ditches
- t** Tanks

Flood Hazard Intermediate

Flood hazards in the areas described in this section are moderate to low and consist primarily of inundation in and along small channels and shallow sheetflooding.

- Ytr** River terraces
- Yl** Holocene and Pleistocene alluvium on piedmont slopes
- Yi** Inactive Holocene alluvial fans and terraces
- Y** Holocene alluvium, undivided
- Yl** Pleistocene and Holocene on inactive alluvial fans and piedmont slopes
- Ye** Mixed Holocene alluvial and eolian deposits on lower piedmont slopes

Flood Hazard Low

Flood hazards in the areas described in this section are generally low and are restricted to fairly well-defined washes and adjacent floodplains.

- Is** Late Pleistocene alluvium
- Il** Middle Pleistocene alluvium
- O** Early Pleistocene alluvium
- TS** Tertiary sediment, undivided
- CV** Colluvium and talus
- R** Bedrock, undivided

Geologic Map Symbols

- Contact, accurate
- - - Contact, approximate
- Gradational contact
- Stream reaches
- Map area boundary, disturbed or political
- Map nest line
- Sub-Watershed boundary

Stateplane projection, zone 202 (central), NAD 83, map units are in feet

Scale 1:48,000

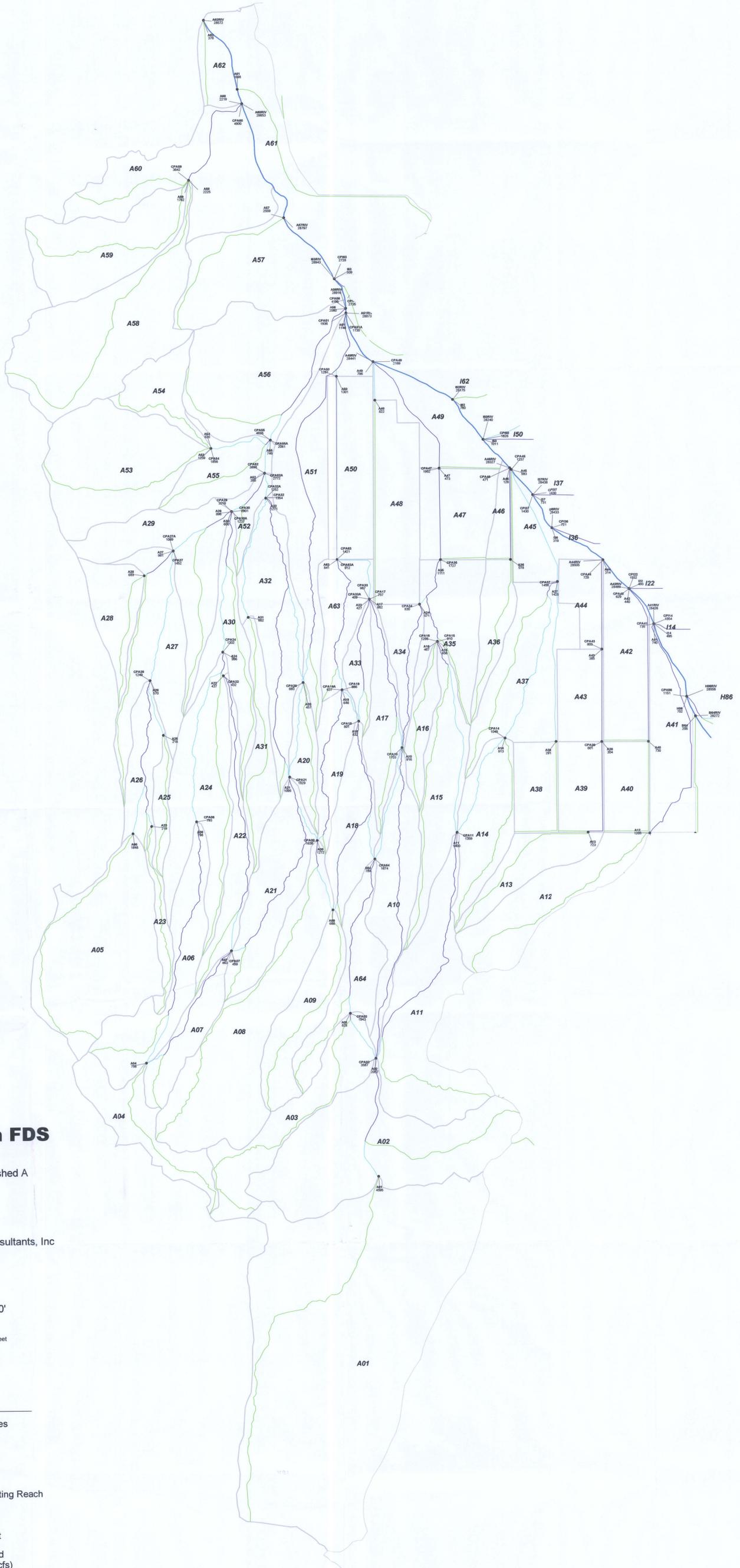


contour interval (in feet) varies by quadrangle:

- Avondale SE - 40
- Avondale SW - 20
- Buckeye - 20
- Butterfield Pass - 40
- Conley Wash - 40
- Gold - 10
- Estrella - 40
- Hobby Hills - 40
- Margie's Peak - 40
- Mobile - 10
- Mobile NE - 10 + 40
- Mobile NW - 20
- Montezuma Peak - 10
- Perryville - 5

Location Map





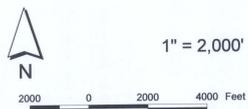
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed A
Map 1 of 10

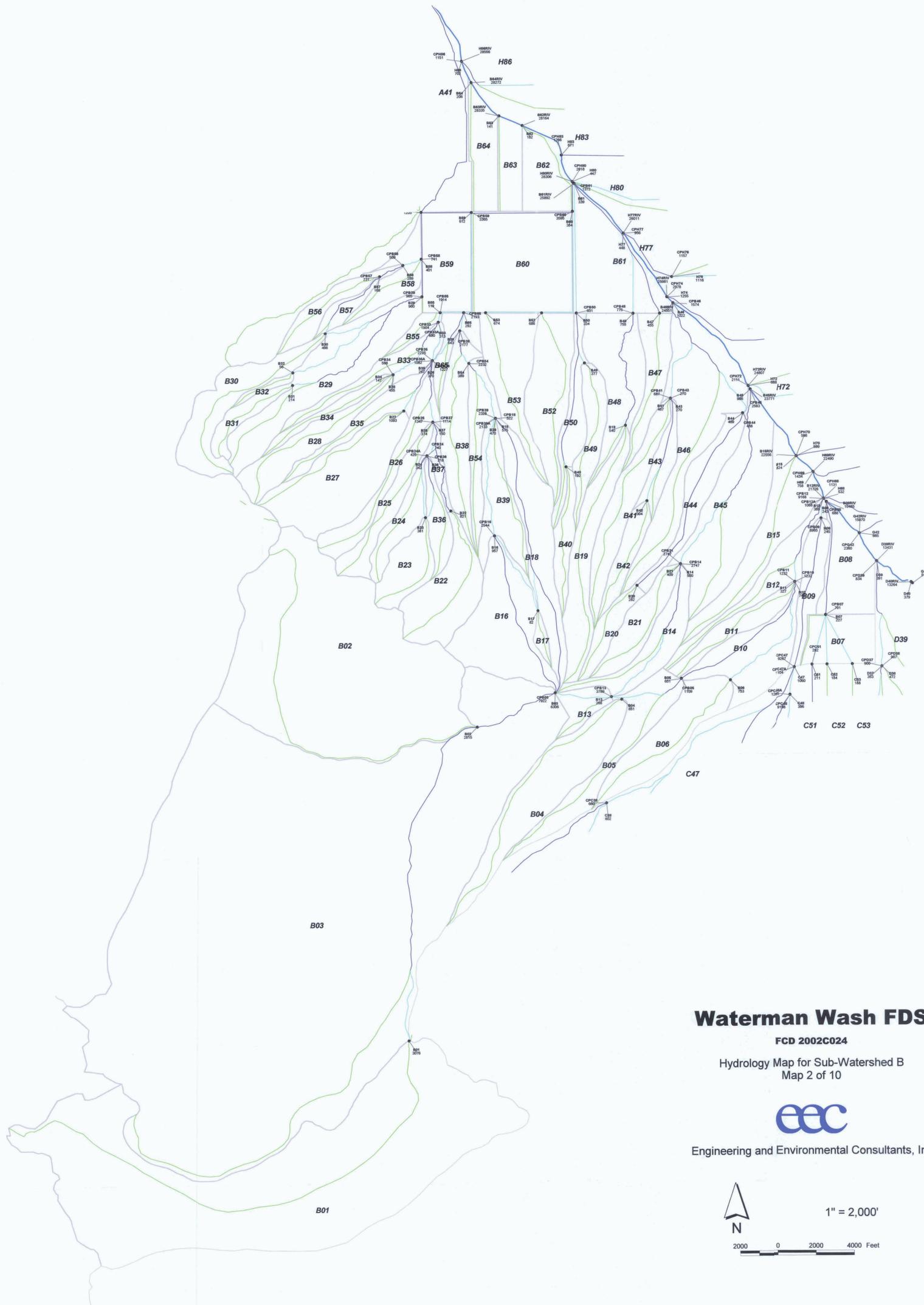


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Legend

- Sub-basin Boundaries
- A01 Sub-basin ID
- ~ T_c Length
- ~ Routing Reach
- ~ T_c Length and Routing Reach
- ~ Waterman Wash
- Concentration Point
- A01
A02 HEC-1 Identifier and
100-Yr 24-hour Q (cfs)



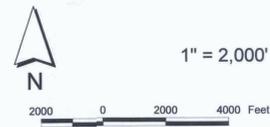
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed B
Map 2 of 10



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Legend

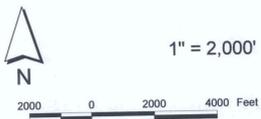
- Sub-basin Boundaries
- A01** Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- HEC-1 Identifier and 100-Yr 24-hour Q (cfs)

Waterman Wash FDS
FCD 2002C024

Hydrology Map for Sub-Watershed C
 Map 3 of 10

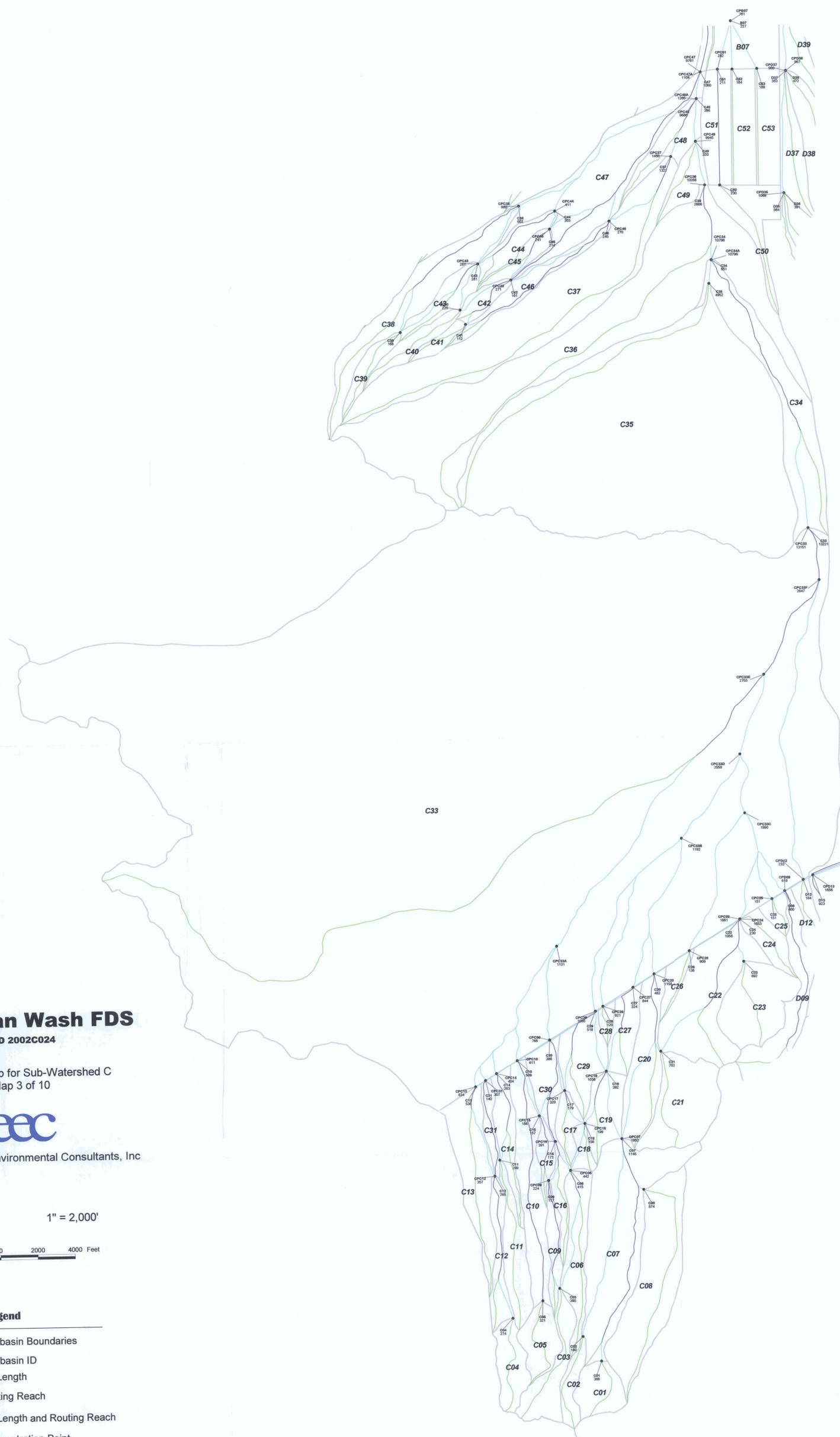


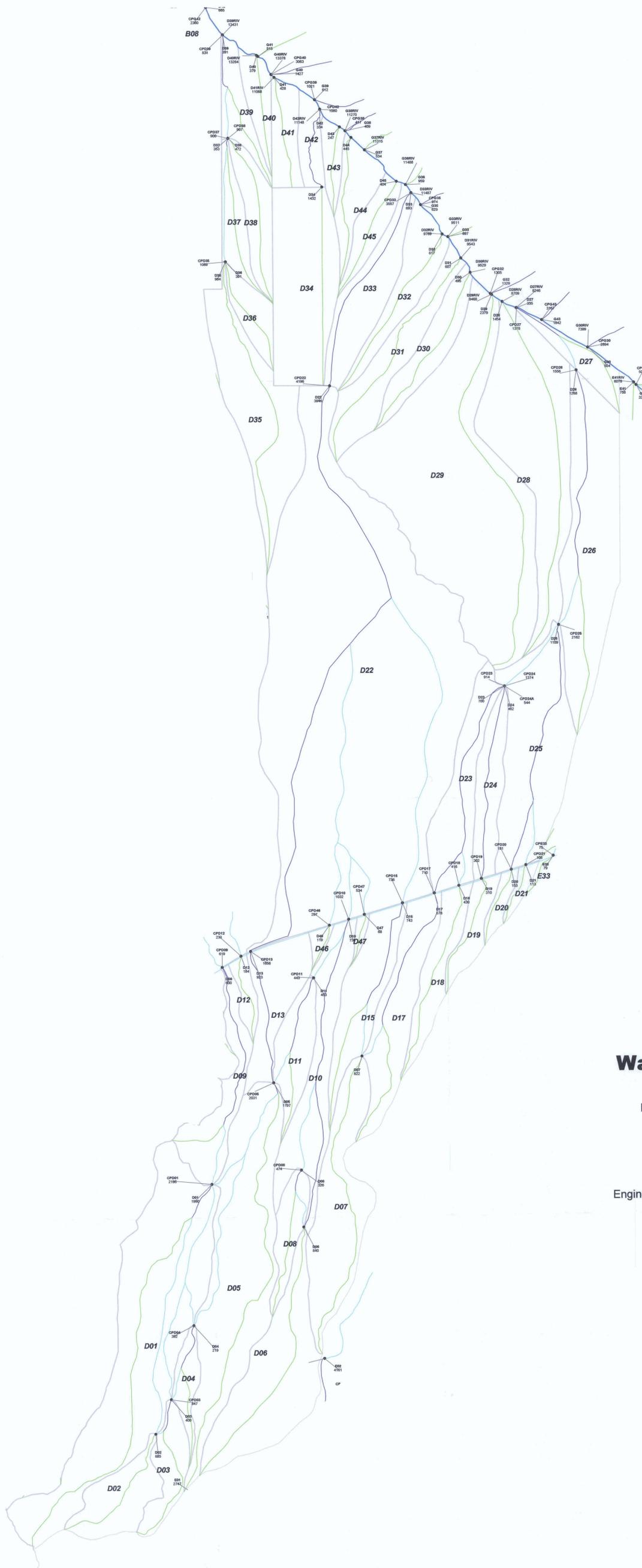
Engineering and Environmental Consultants, Inc.



Legend

- Sub-basin Boundaries
- A01** Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- A01
000 HEC-1 Identifier and 100-Yr 24-hour Q (cfs)





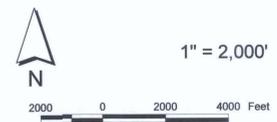
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed D
Map 4 of 10

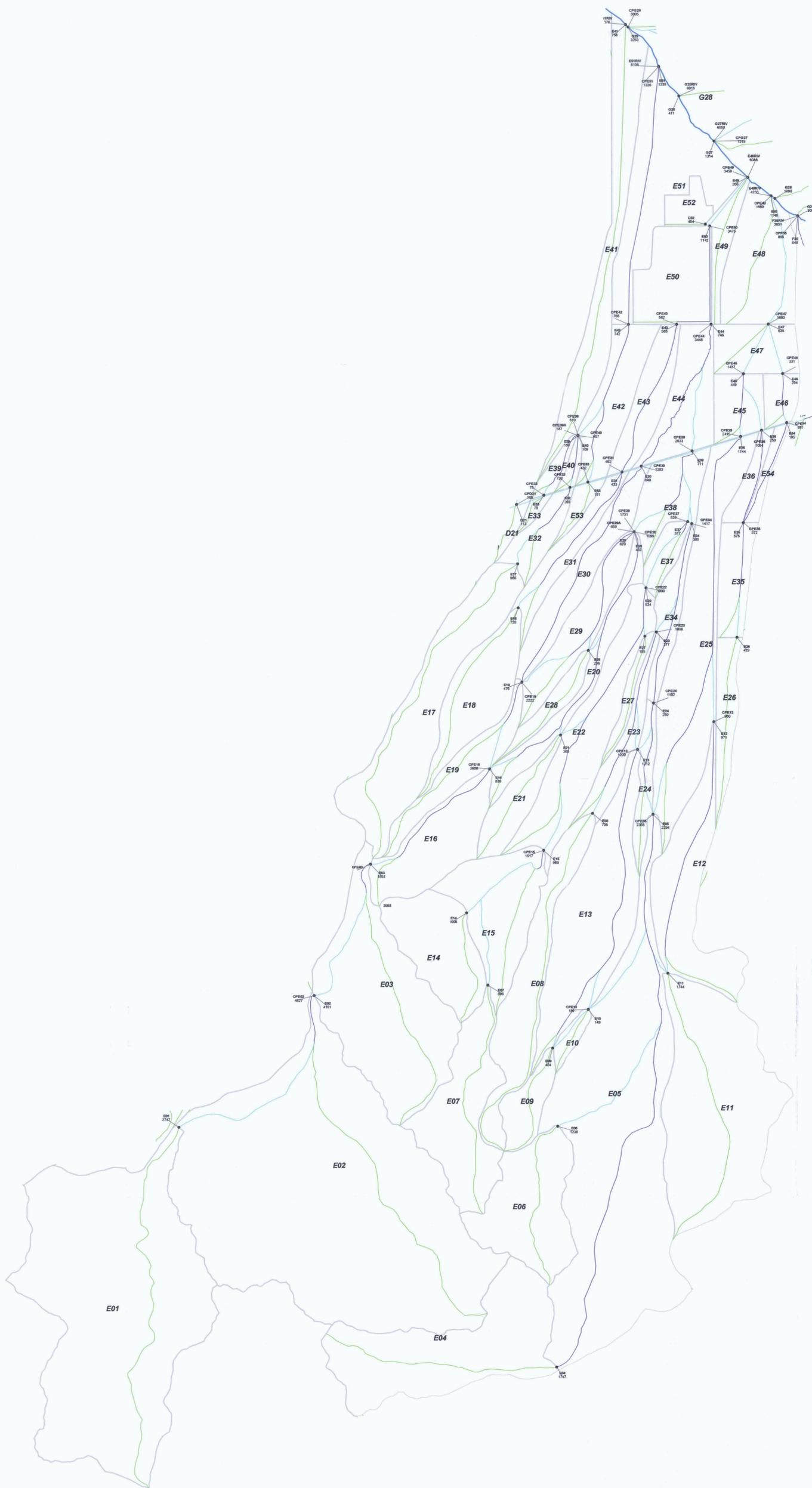


Engineering and Environmental Consultants, Inc



Legend

- Sub-basin Boundaries
- Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- HEC-1 Identifier and 100-Yr 24-hour Q (cfs)



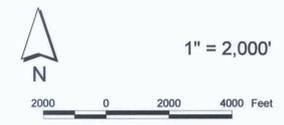
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed E
Map 5 of 10



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Legend

- Sub-basin Boundaries
- A01** Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- HEC-1 Identifier and 100-Yr 24-hour Q (cfs)



Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed F
Map 6 of 10



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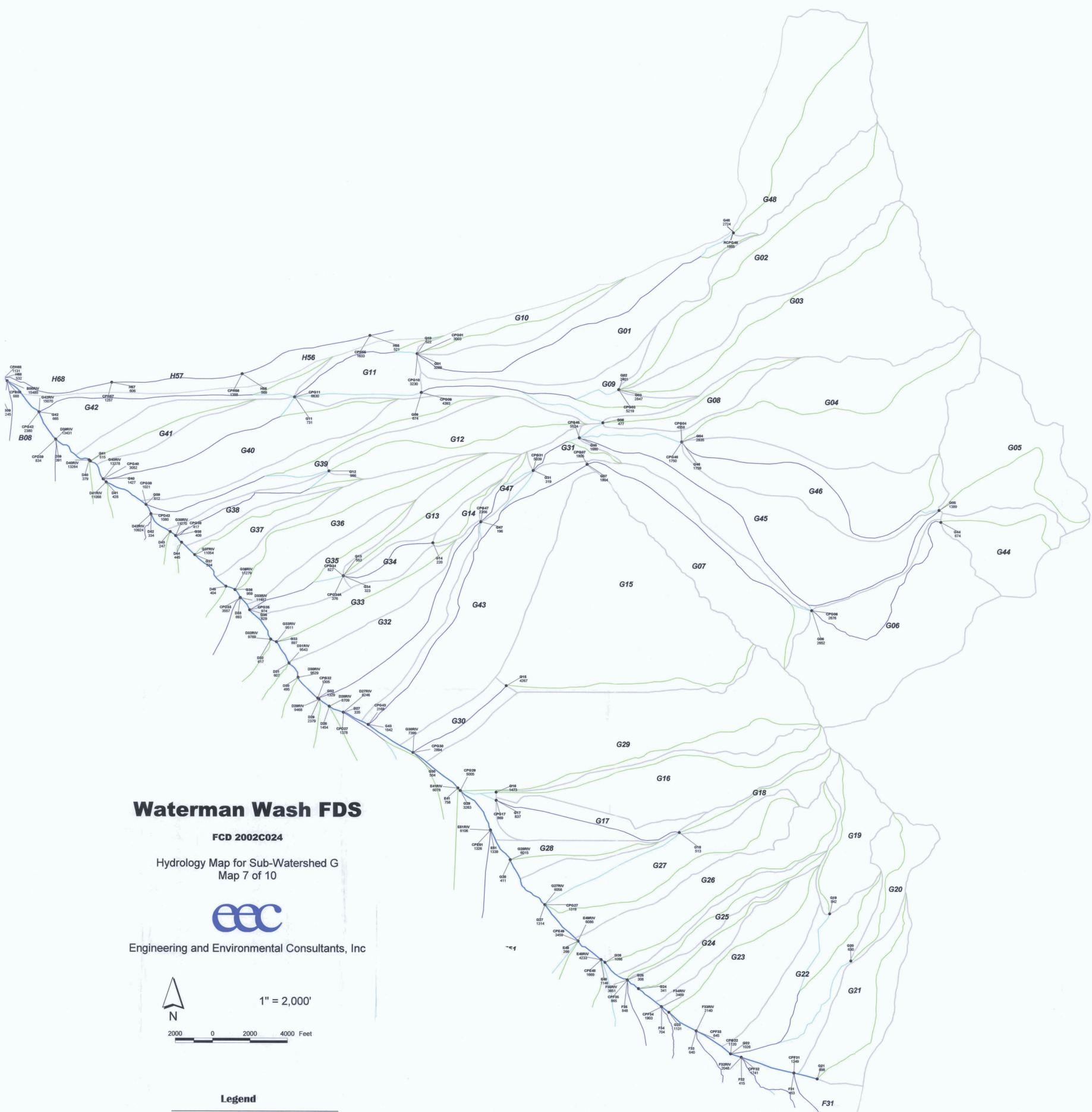


1" = 2,000'



Legend

- Sub-basin Boundaries
- Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- HEC-1 Identifier and 100-Yr 24-hour Q (cfs)



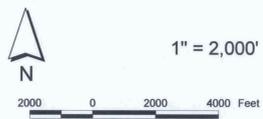
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed G
Map 7 of 10

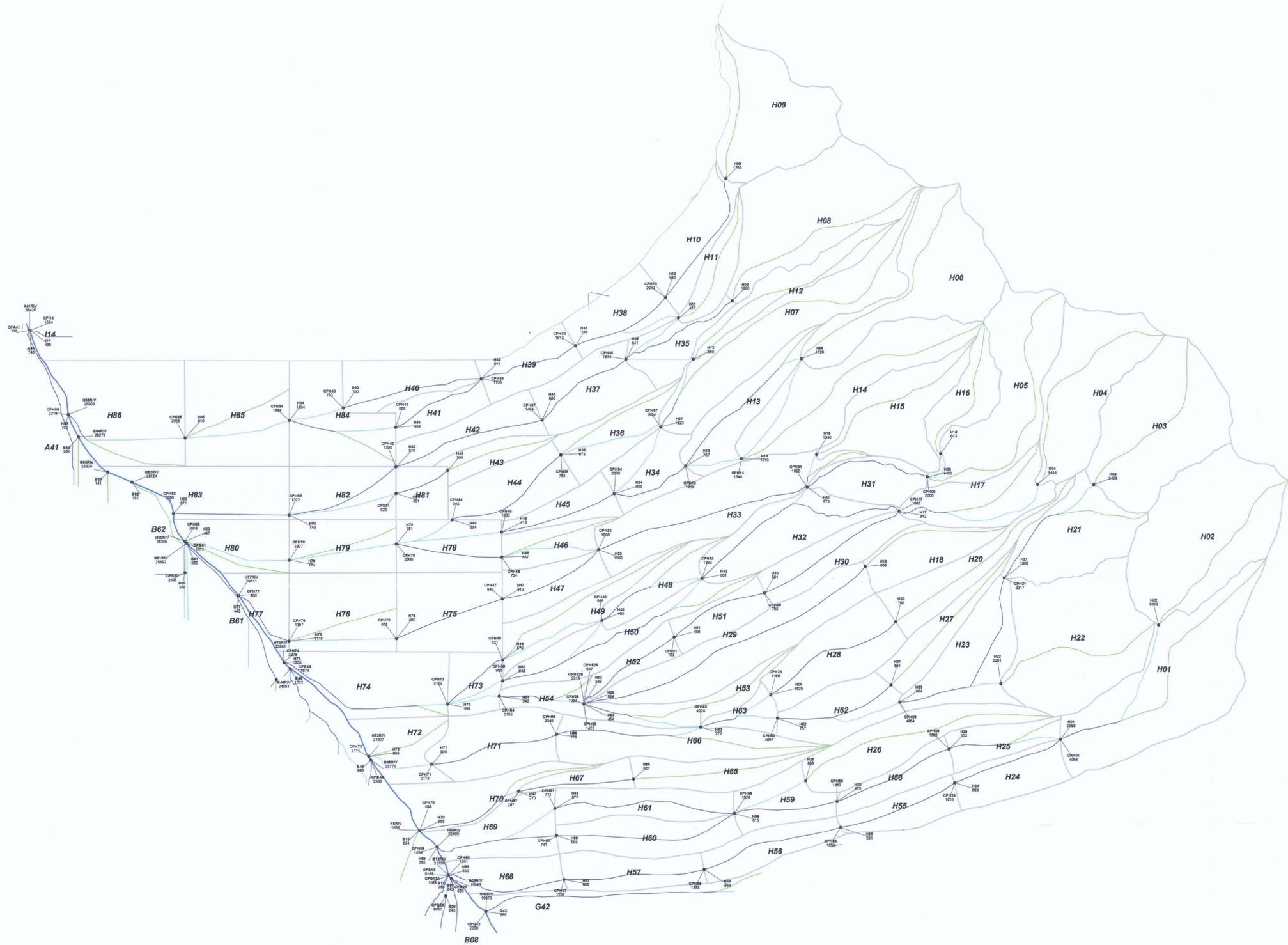


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Legend

- Sub-basin Boundaries
- A01** Sub-basin ID
- T_c Length
- Routing Reach
- T_c Length and Routing Reach
- Concentration Point
- HEC-1 Identifier and 100-Yr 24-hour Q (cfs)



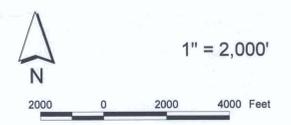
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed H
Map 8 of 10



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Legend

-  Sub-basin Boundaries
-  Sub-basin ID
-  T_c Length
-  Routing Reach
-  T_c Length and Routing Reach
-  Concentration Point
-  HEC-1 Identifier and 100-Yr 24-hour Q (cfs)

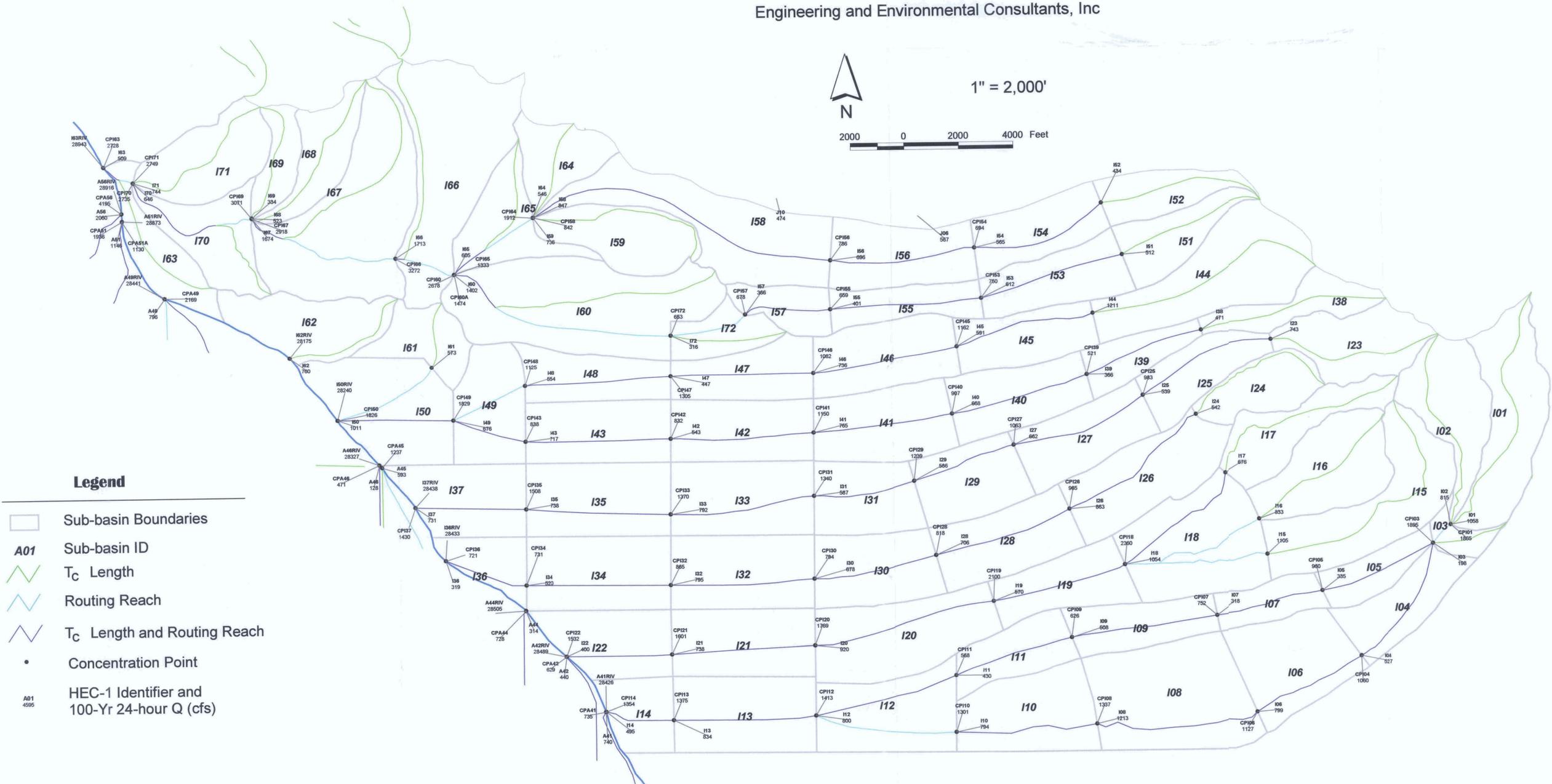
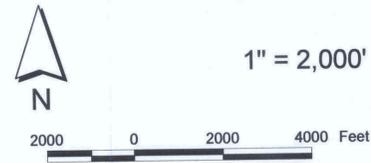
Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed I
Map 9 of 10



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Legend

-  Sub-basin Boundaries
-  Sub-basin ID
-  T_c Length
-  Routing Reach
-  T_c Length and Routing Reach
-  Concentration Point
-  HEC-1 Identifier and 100-Yr 24-hour Q (cfs)

A01
4595

Legend

-  Sub-basin Boundaries
- A01** Sub-basin ID
-  T_c Length
-  Routing Reach
-  T_c Length and Routing Reach
-  Concentration Point
-  HEC-1 Identifier and 100-Yr 24-hour Q (cfs)

Waterman Wash FDS

FCD 2002C024

Hydrology Map for Sub-Watershed J
Map 10 of 10

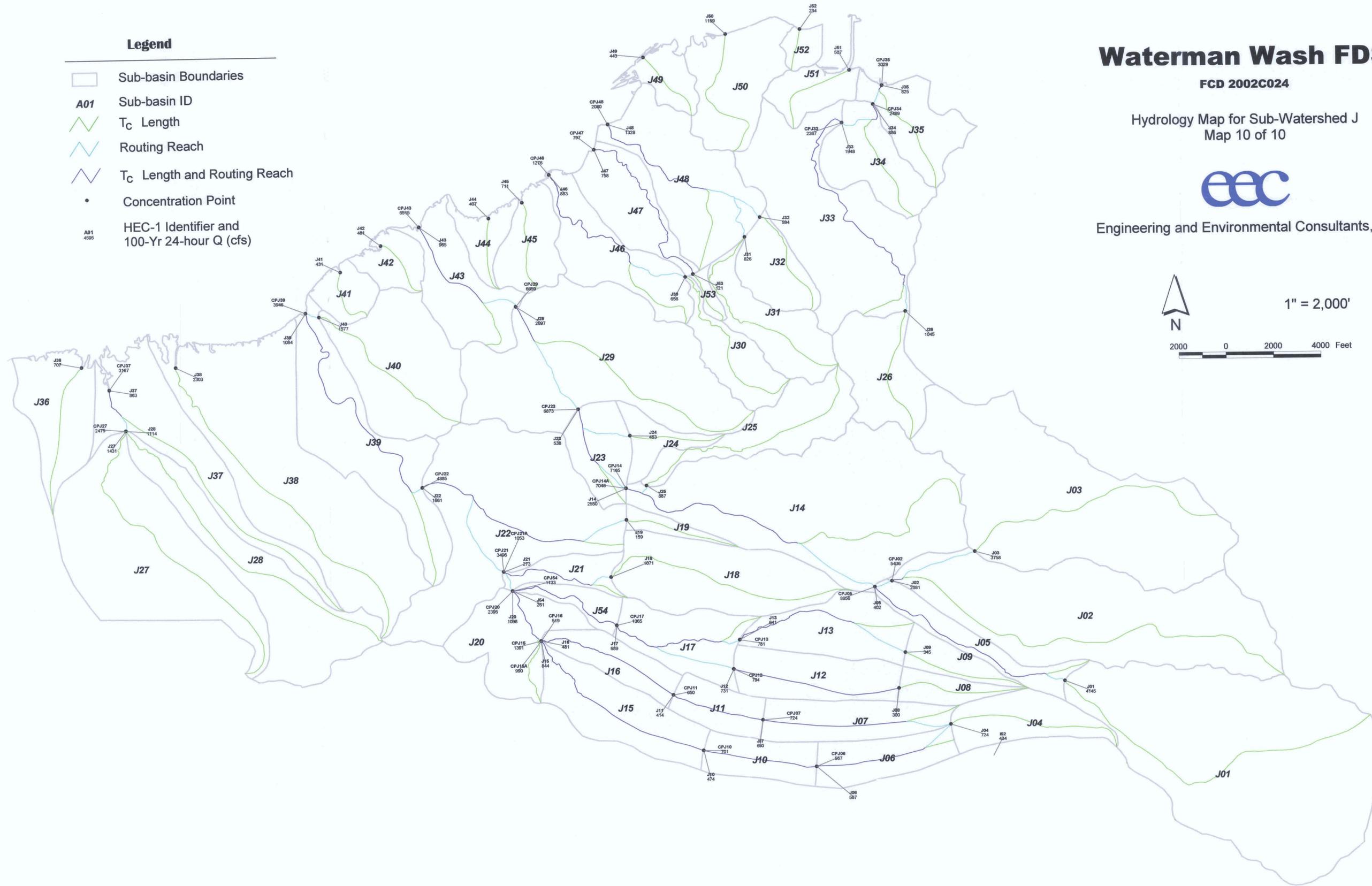


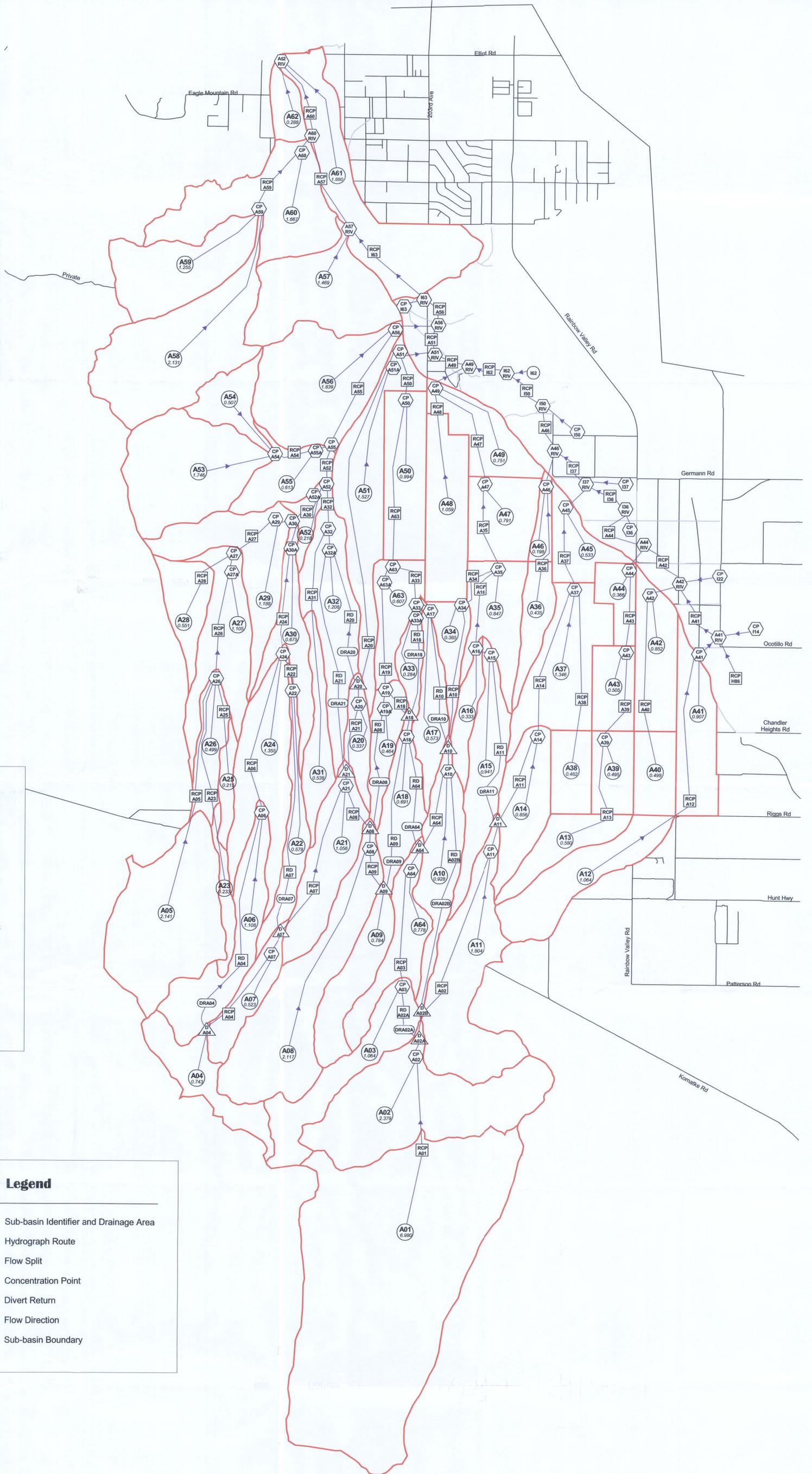
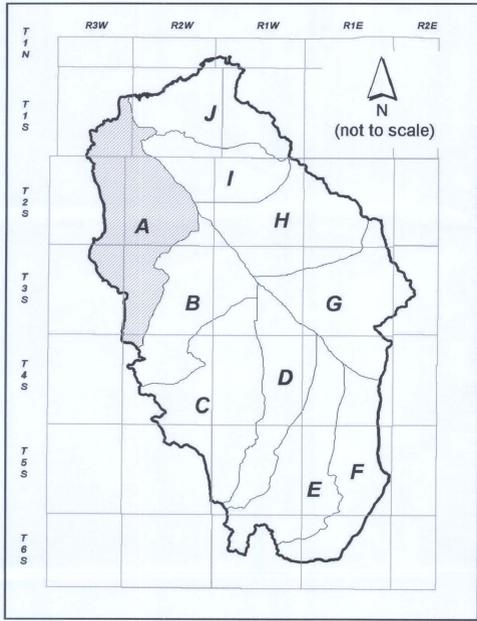
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1" = 2,000'

2000 0 2000 4000 Feet





Waterman Wash FDS
FCD 2002C024

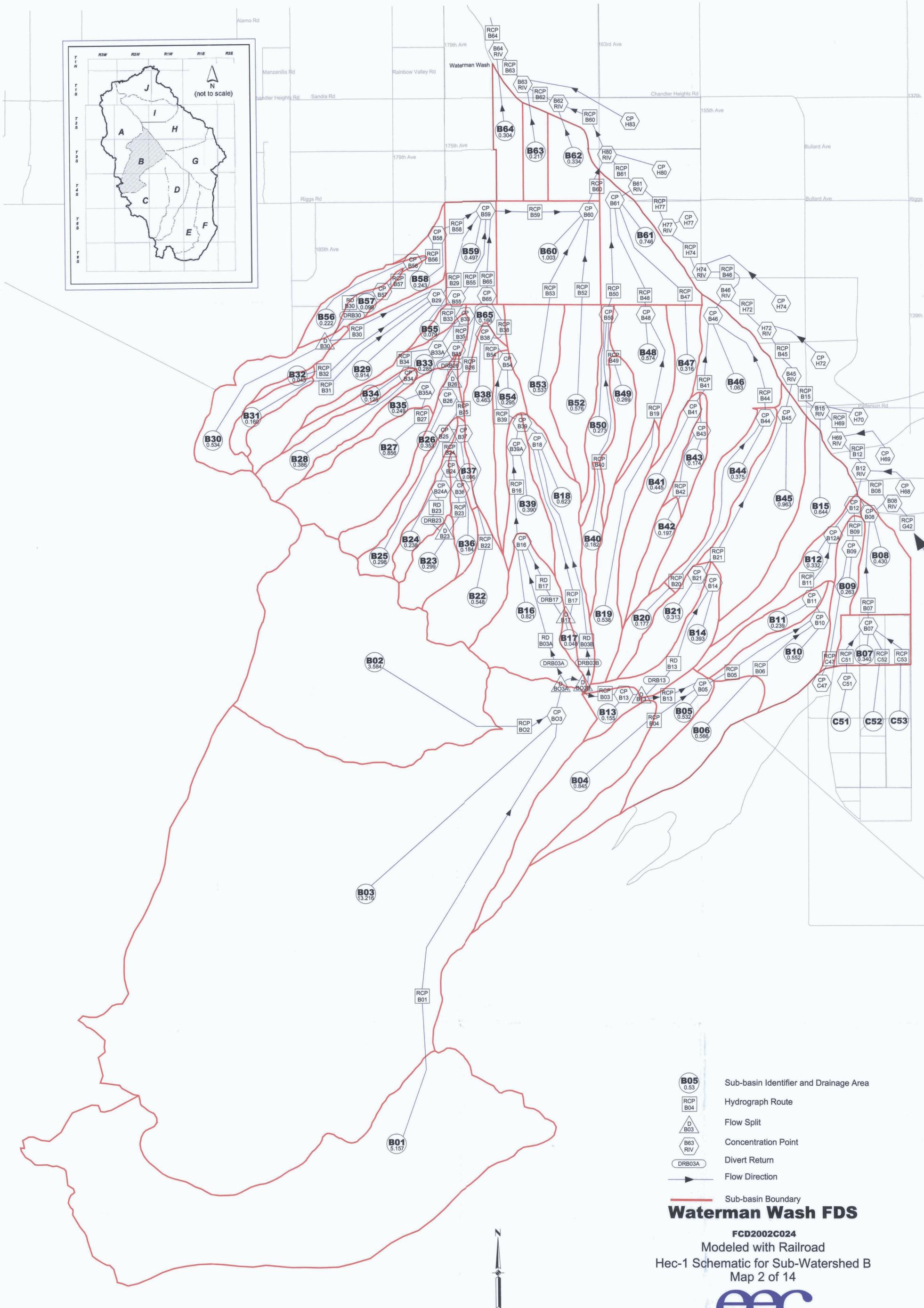
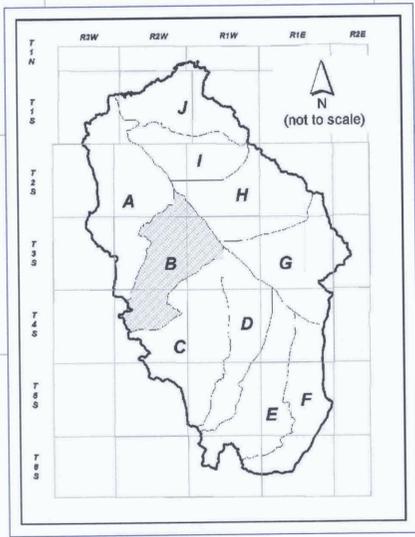
Modeled with Railroad
 HEC-1 Schematic for Sub-Watershed A
 Map 1 of 14

Engineering and Environmental Consultants, Inc.

1" = 2,000'

Legend

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

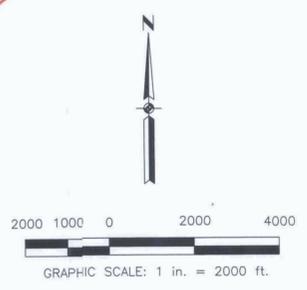


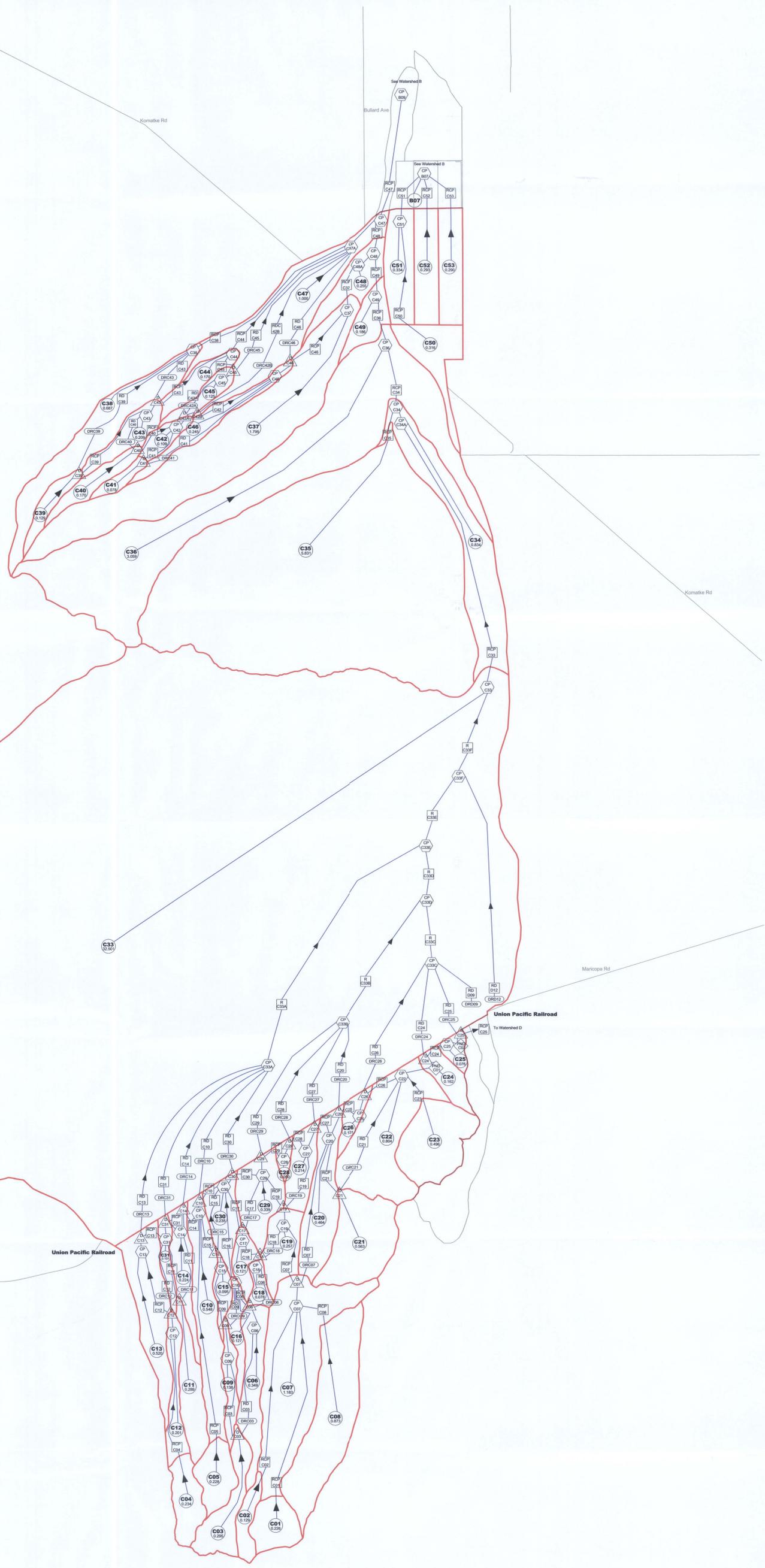
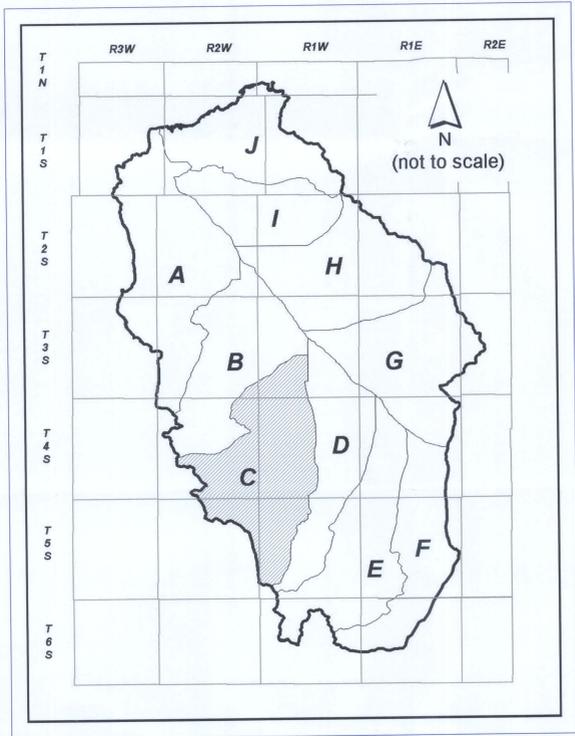
- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

Waterman Wash FDS
 FCD2002C024
 Modeled with Railroad
 Hec-1 Schematic for Sub-Watershed B
 Map 2 of 14



Engineering and Environmental Consultants, Inc



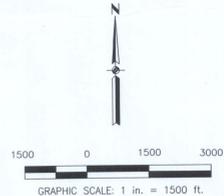


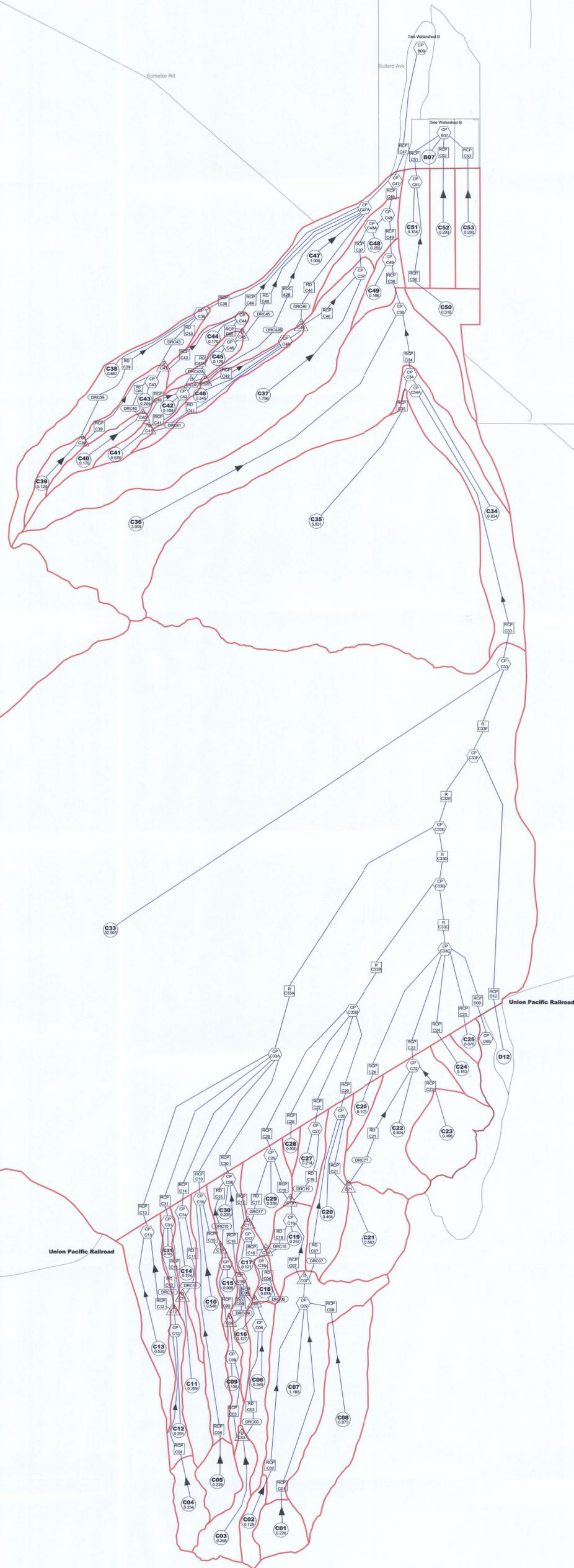
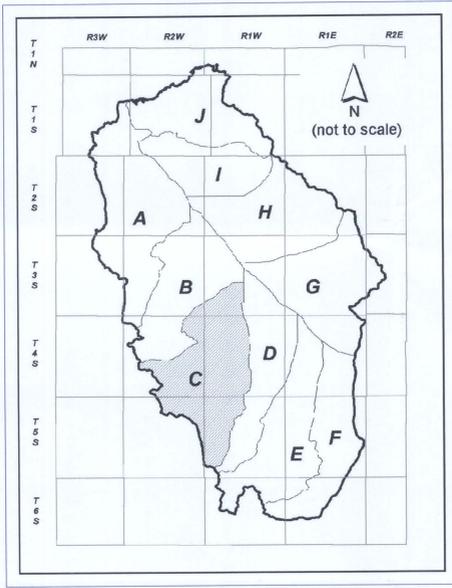
- Storage Pond Identifier
- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

Waterman Wash FDS
FCD2002C024
 Modeled with Railroad
 Hec-1 Schematic for Sub-Watershed C
 Map 3 of 14



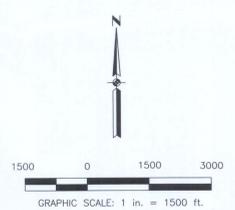
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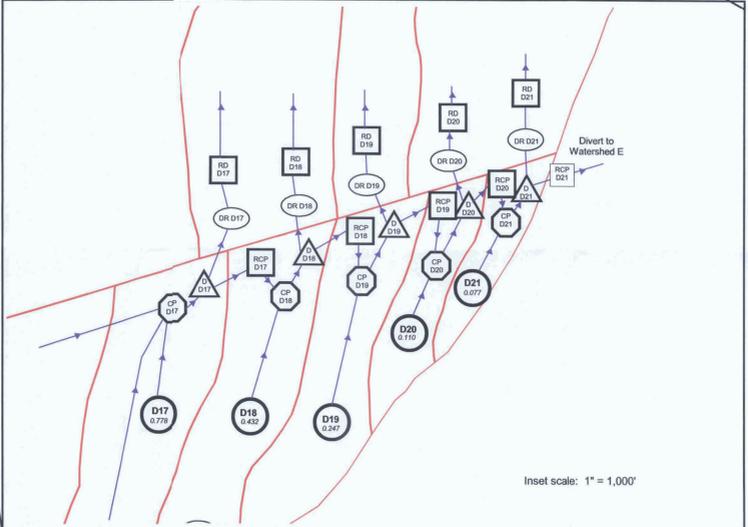
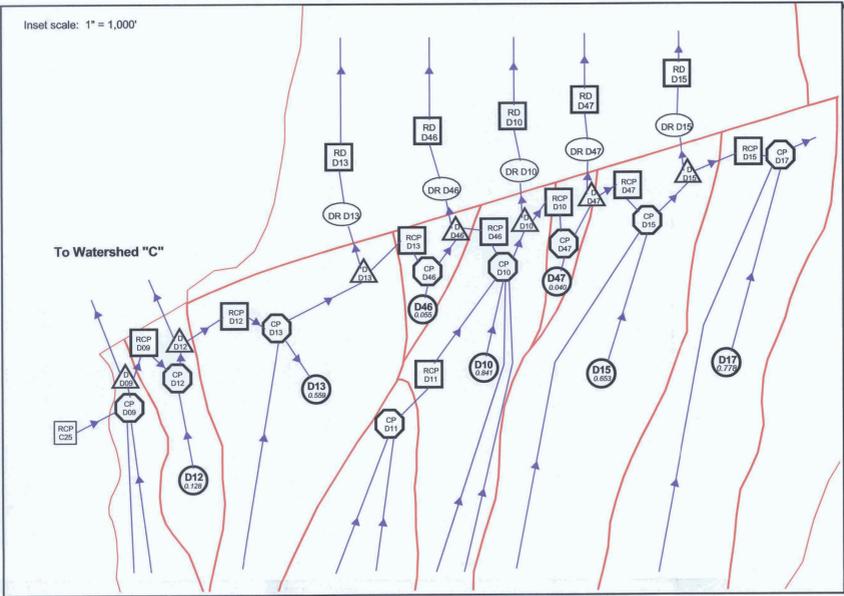
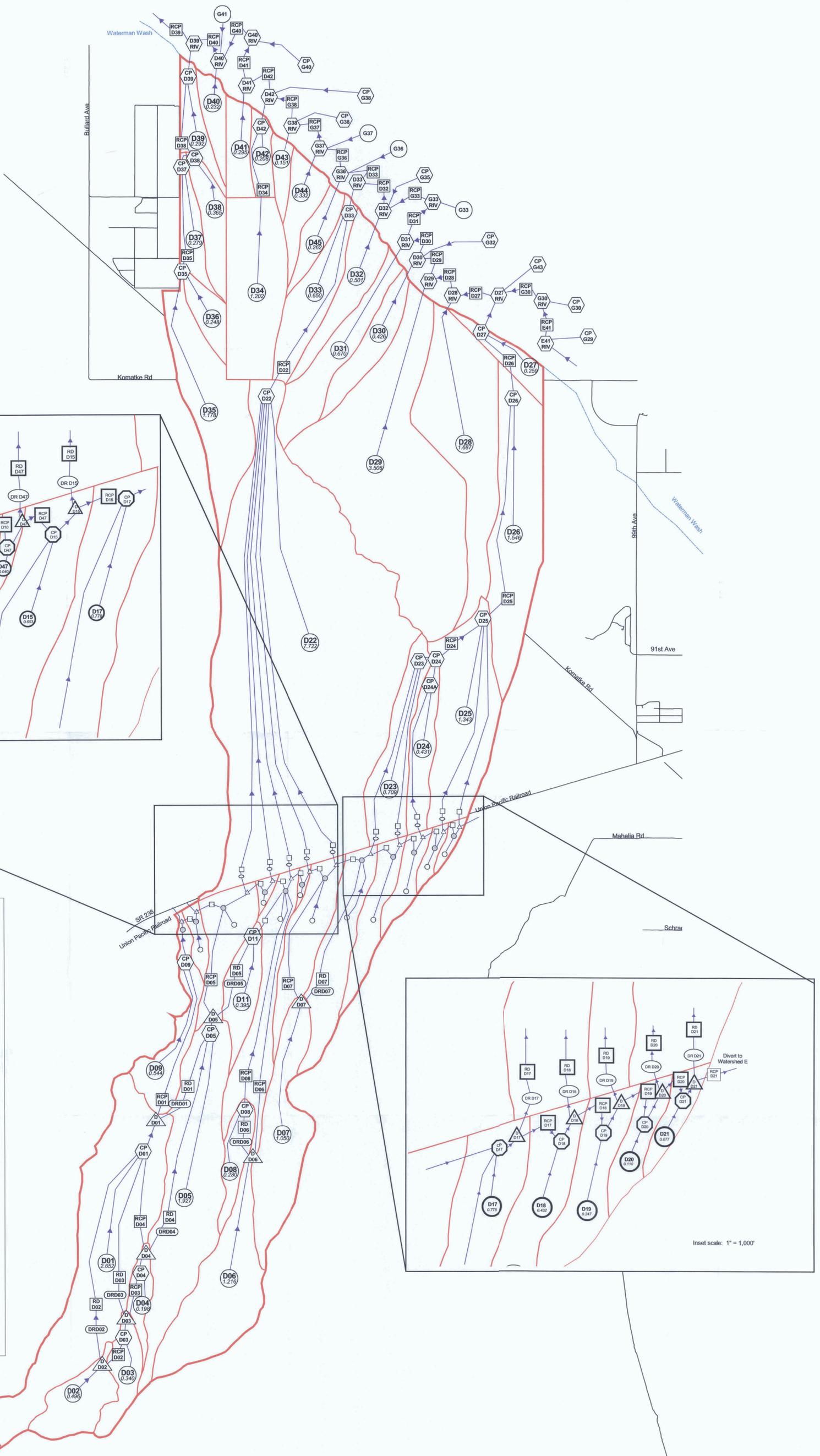
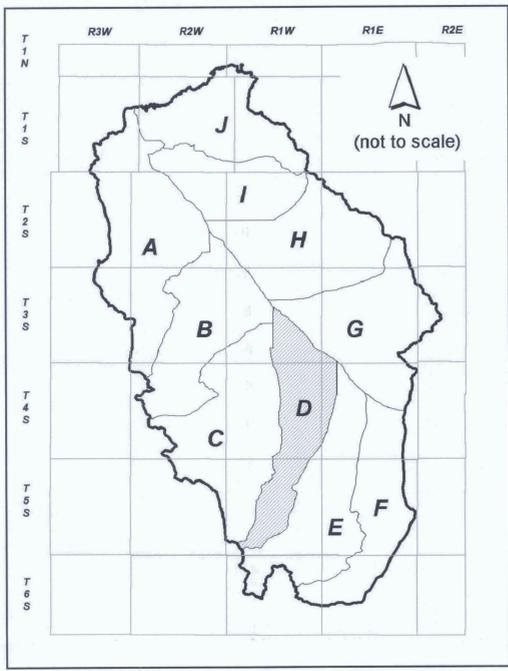




- Storage Pond Identifier
- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

Waterman Wash FDS
 FCD2002C024
 Modeled without Railroad
 Hec-1 Schematic for Sub-Watershed C
 Map 4 of 14



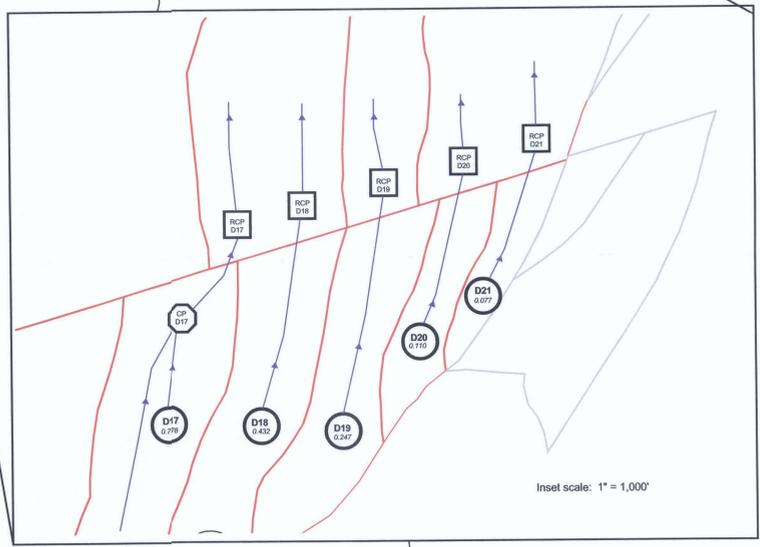
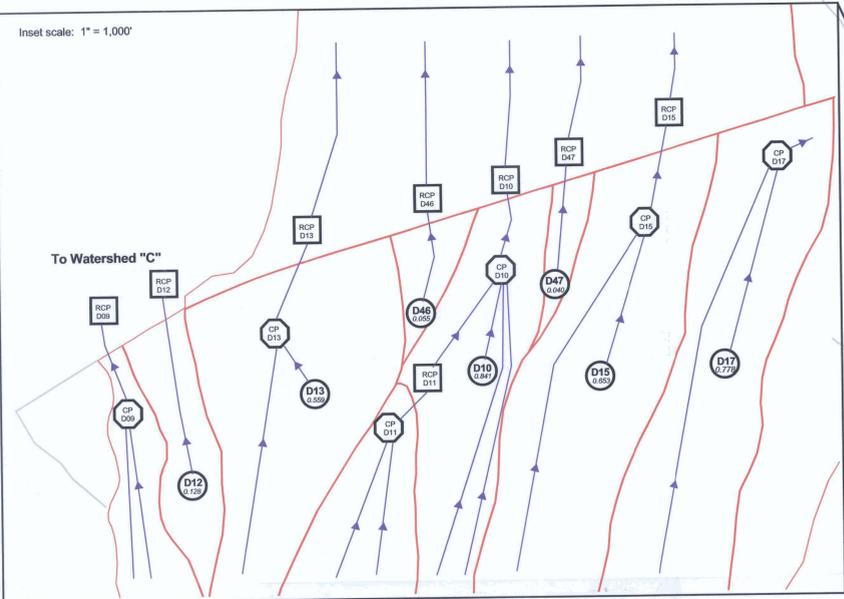
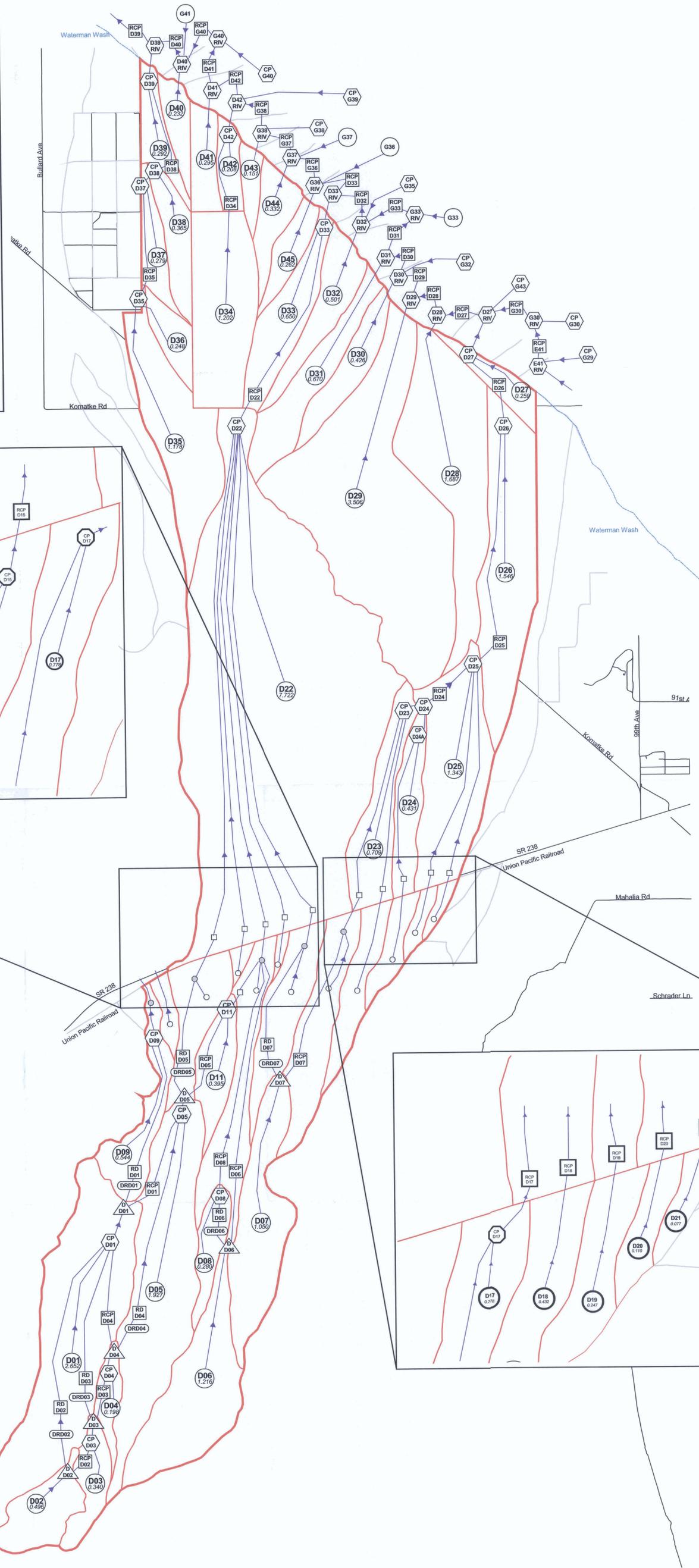
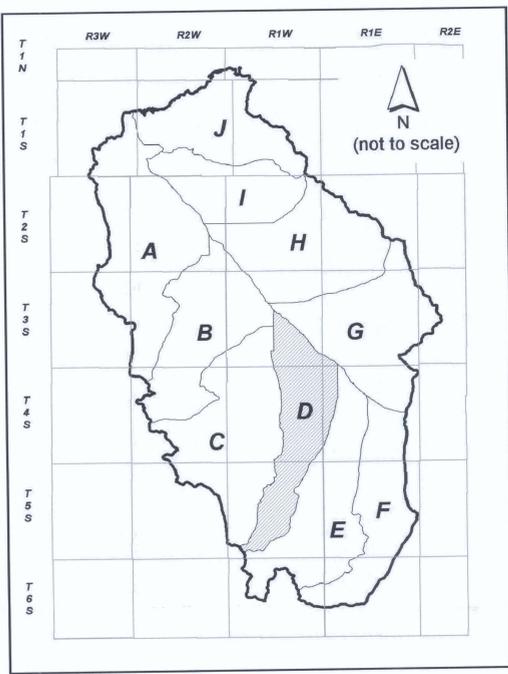


Waterman Wash FDS
 FCD 2002C024
 Modeled with Railroad
 HEC-1 Schematic for Sub-Watershed "D"
 Map 5 of 14

eec
 Engineering and Environmental Consultants, Inc

1" = 2,000'
 2000 0 2000 4000 Feet

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary



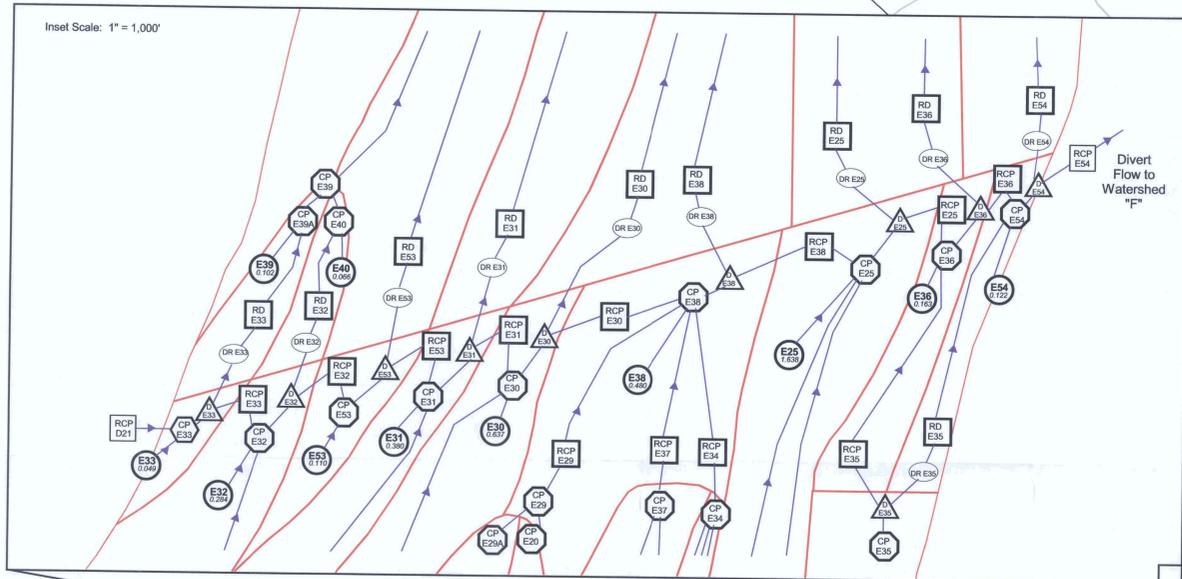
Waterman Wash FDS
FCD 2002C024

Modeled without Railroad
 HEC-1 Schematic for Sub-Watershed "D"
 Map 6 of 14

Engineering and Environmental Consultants, Inc

1" = 2,000'

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary



Waterman Wash FDS

FCD 2002C024

Modeled with Railroad
HEC-1 Schematic for Watershed "E"
Map 7 of 14



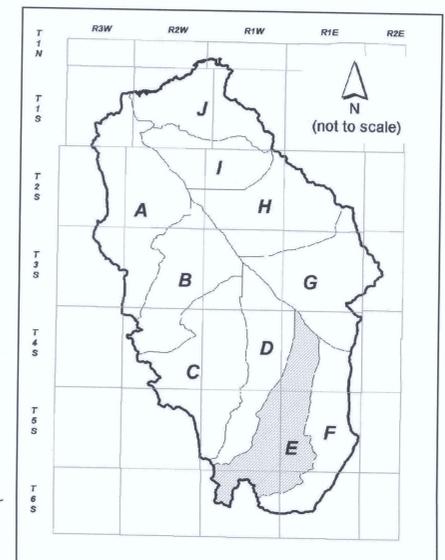
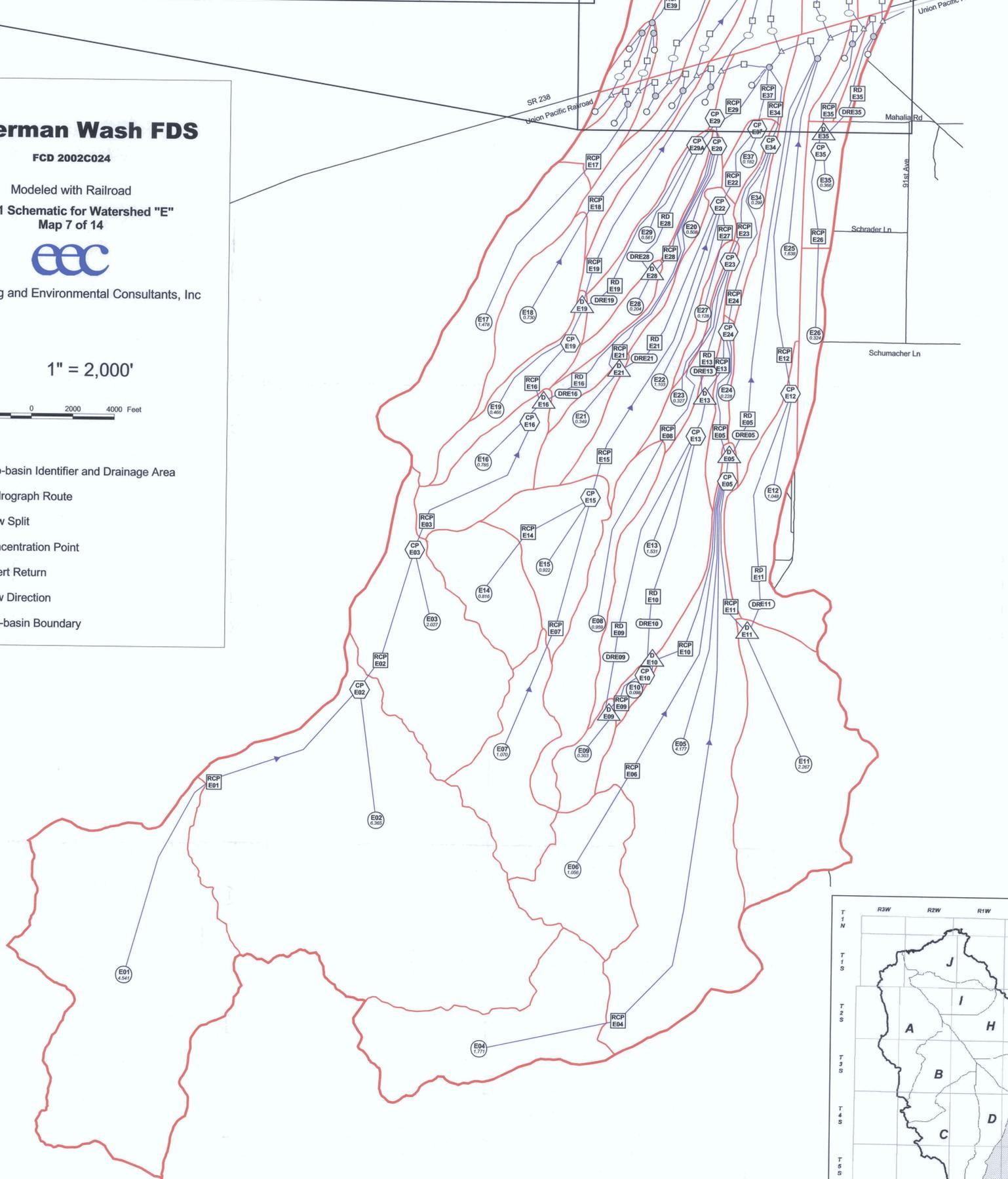
Engineering and Environmental Consultants, Inc



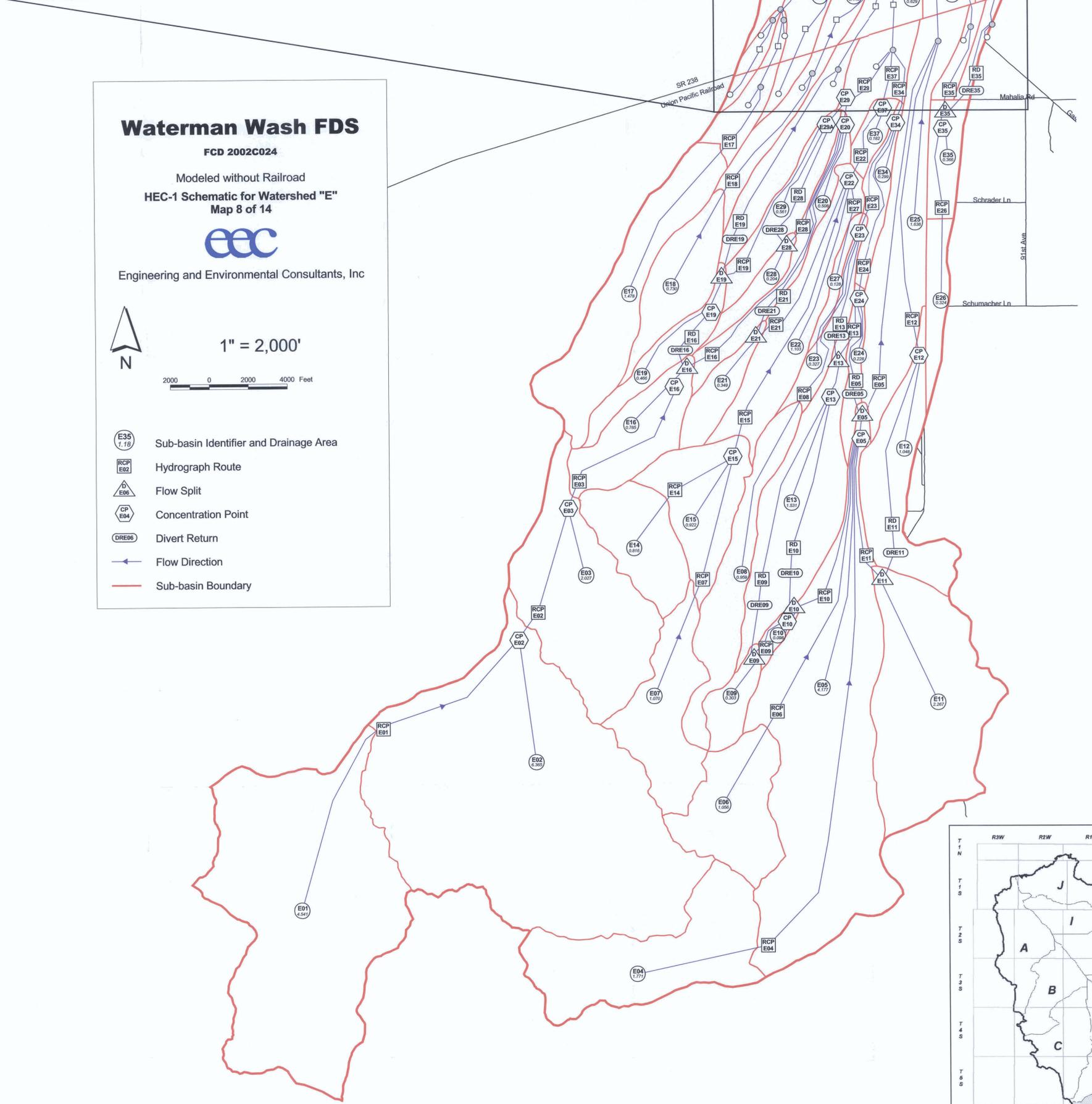
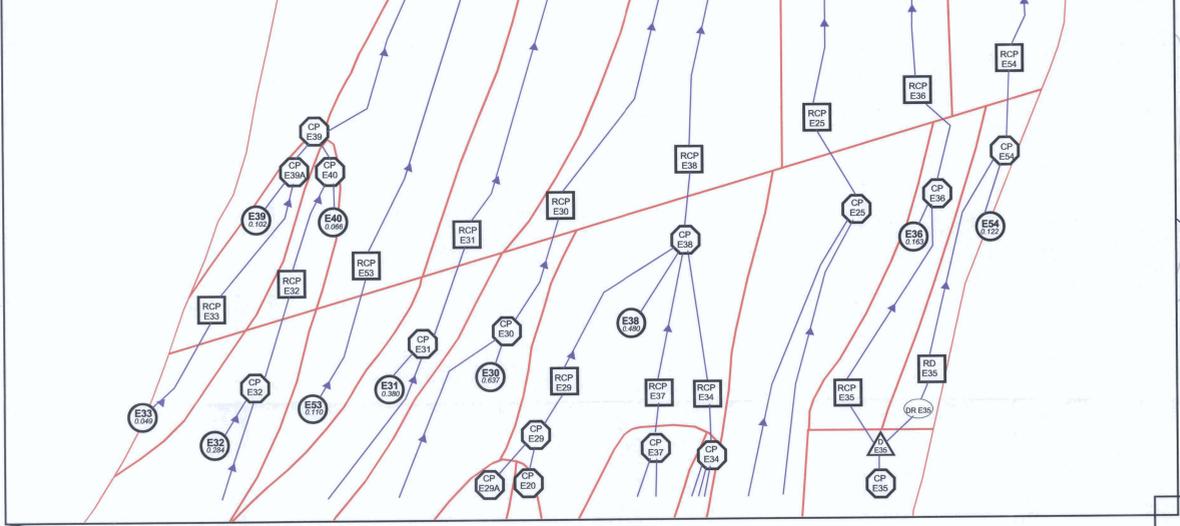
1" = 2,000'



- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary



Inset Scale: 1" = 1,000'



Waterman Wash FDS

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Modeled without Railroad
HEC-1 Schematic for Watershed "E"
Map 8 of 14



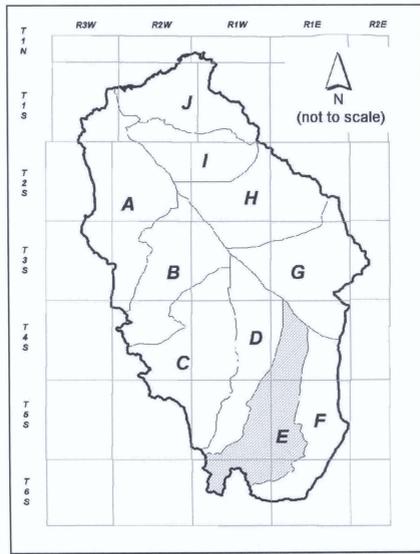
Engineering and Environmental Consultants, Inc

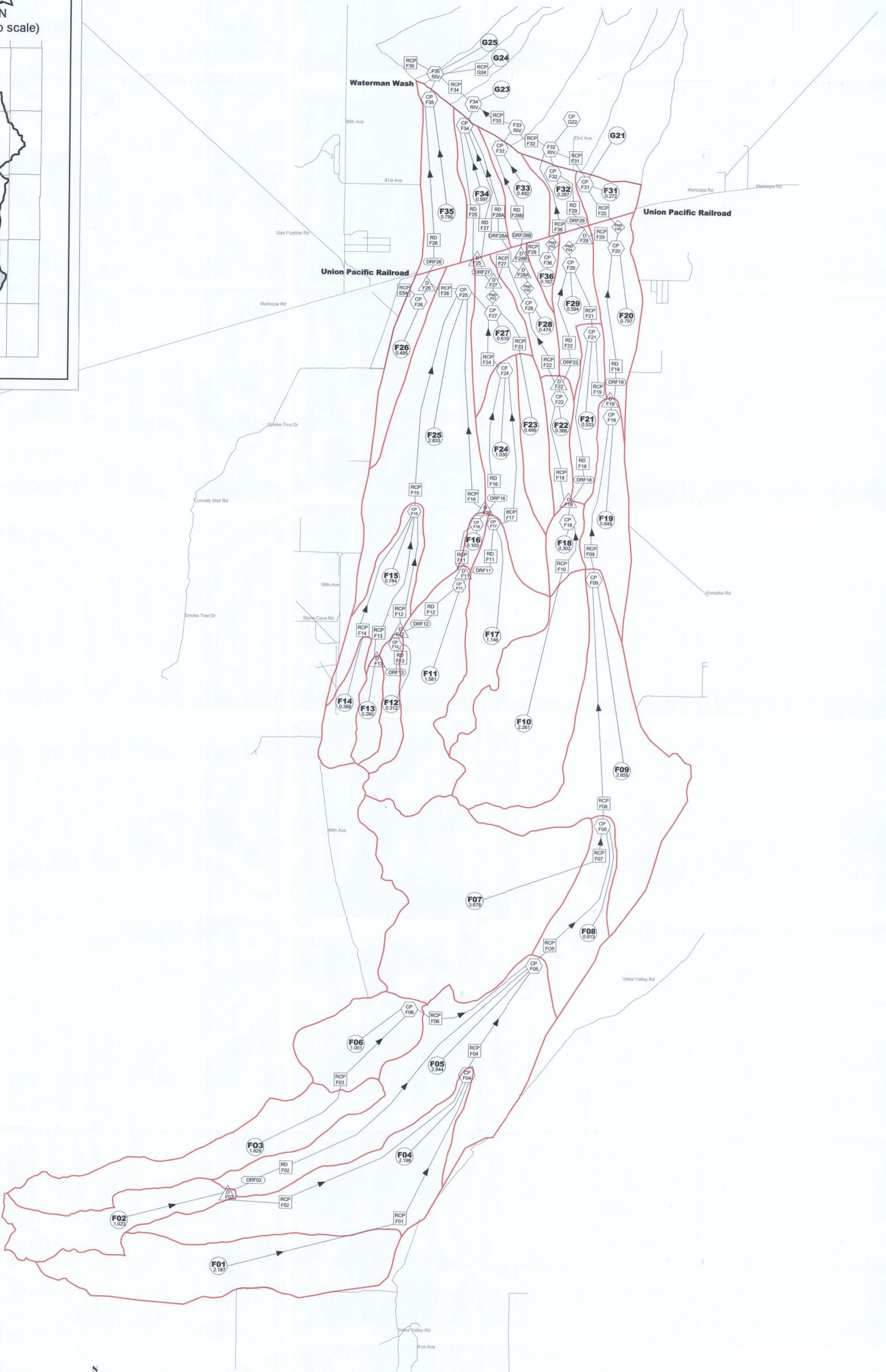
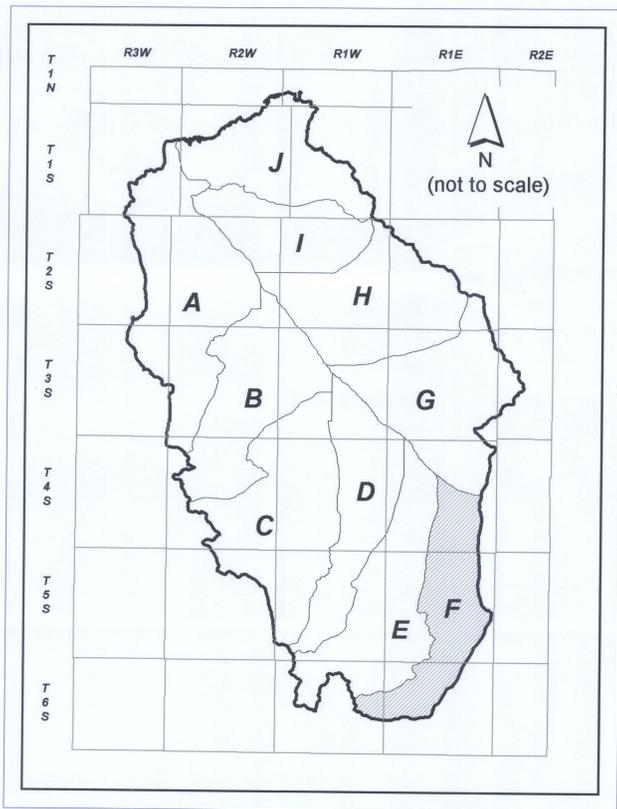


1" = 2,000'

2000 0 2000 4000 Feet

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary



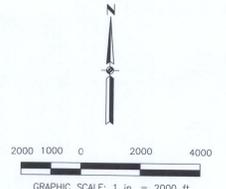


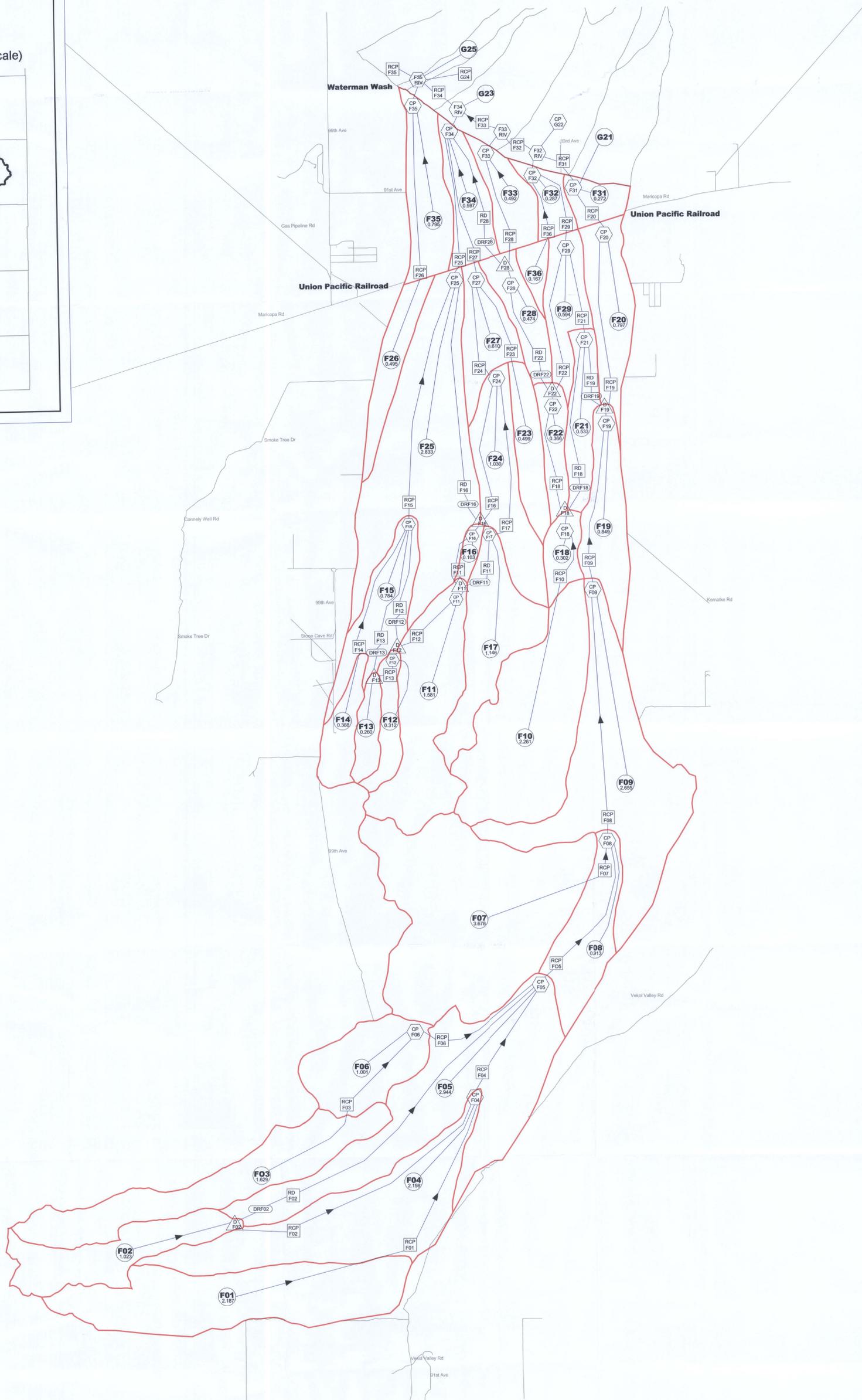
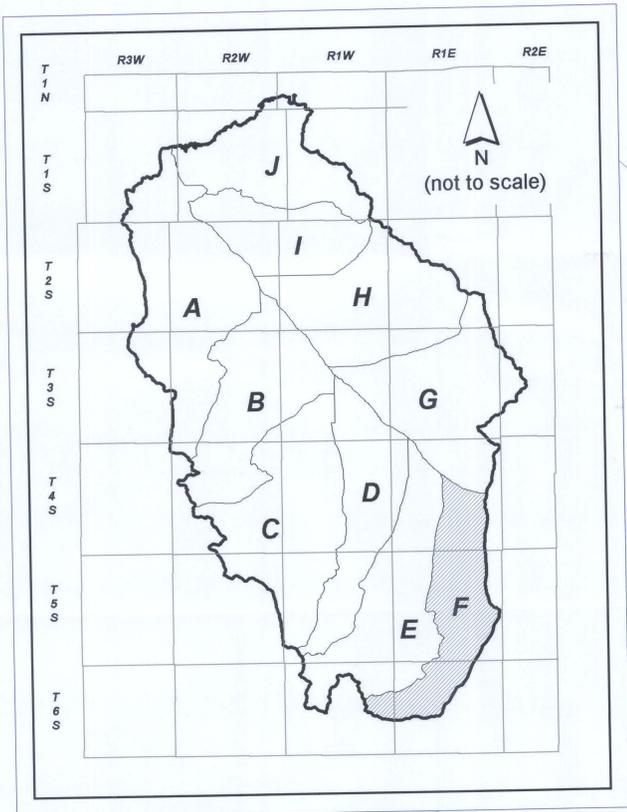
- Storage Pond Identifier
- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

Waterman Wash FDS
 FCD2002C024
 Modeled with Railroad
 Hec-1 Schematic for Sub-Watershed F
 Map 9 of 14



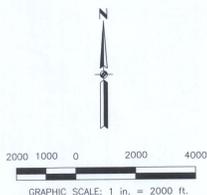
Engineering and Environmental Consultants, Inc





- Storage Pond Identifier
- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

Waterman Wash FDS
 FCD2002C024
 Modeled without Railroad
 Hec-1 Schematic for Sub-Watershed F
 Map 10 of 14



Waterman Wash FDS

FCD 2002C024

Modeled with Railroad

HEC-1 Schematic for Watershed "H"
Map 12 of 14

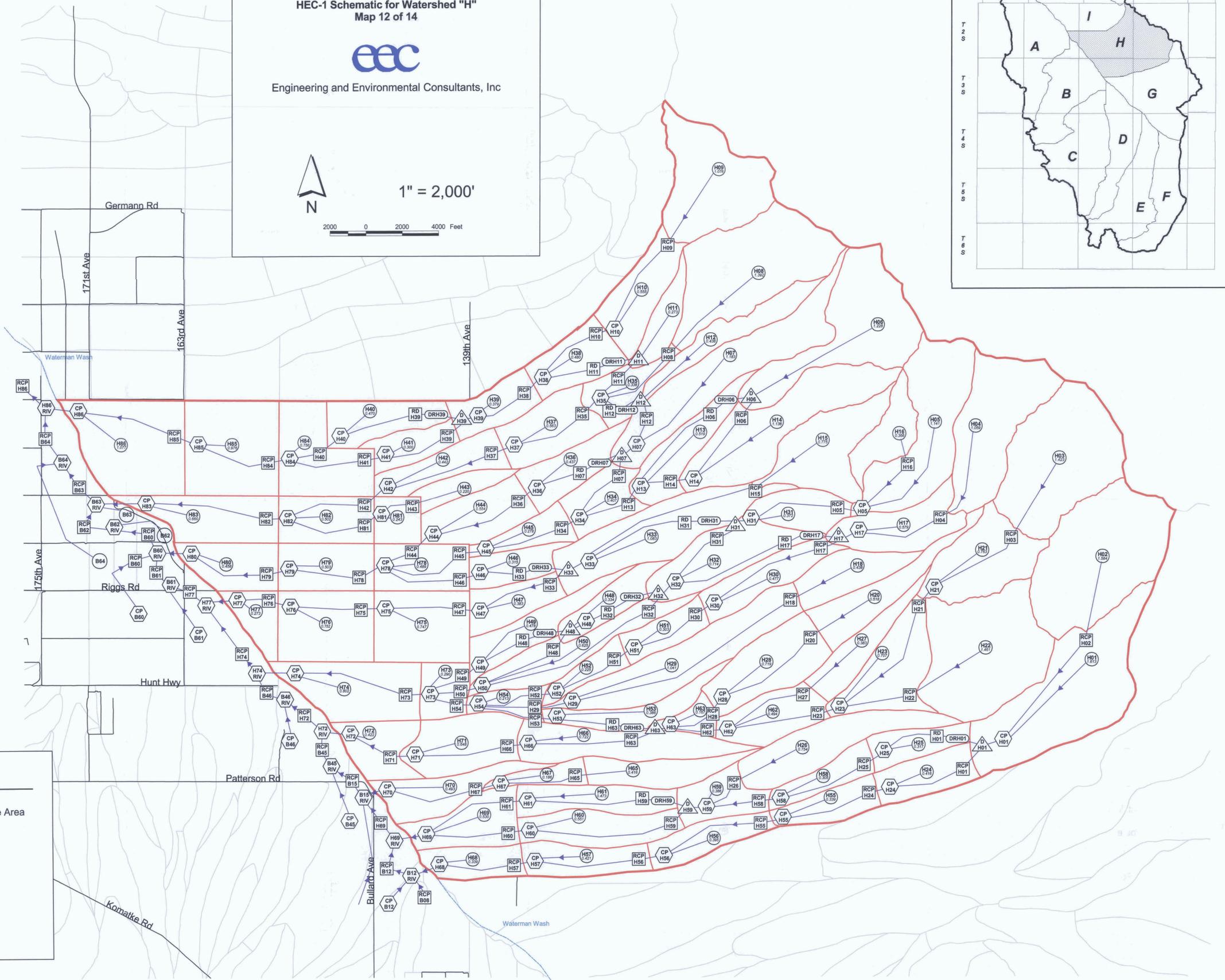
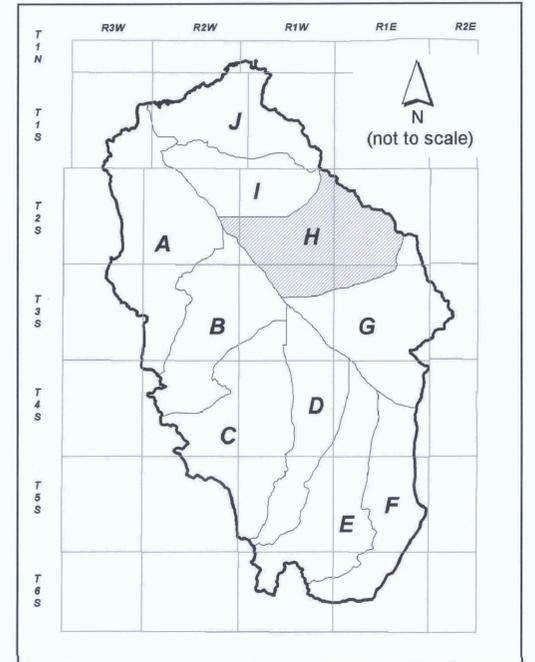


Engineering and Environmental Consultants, Inc



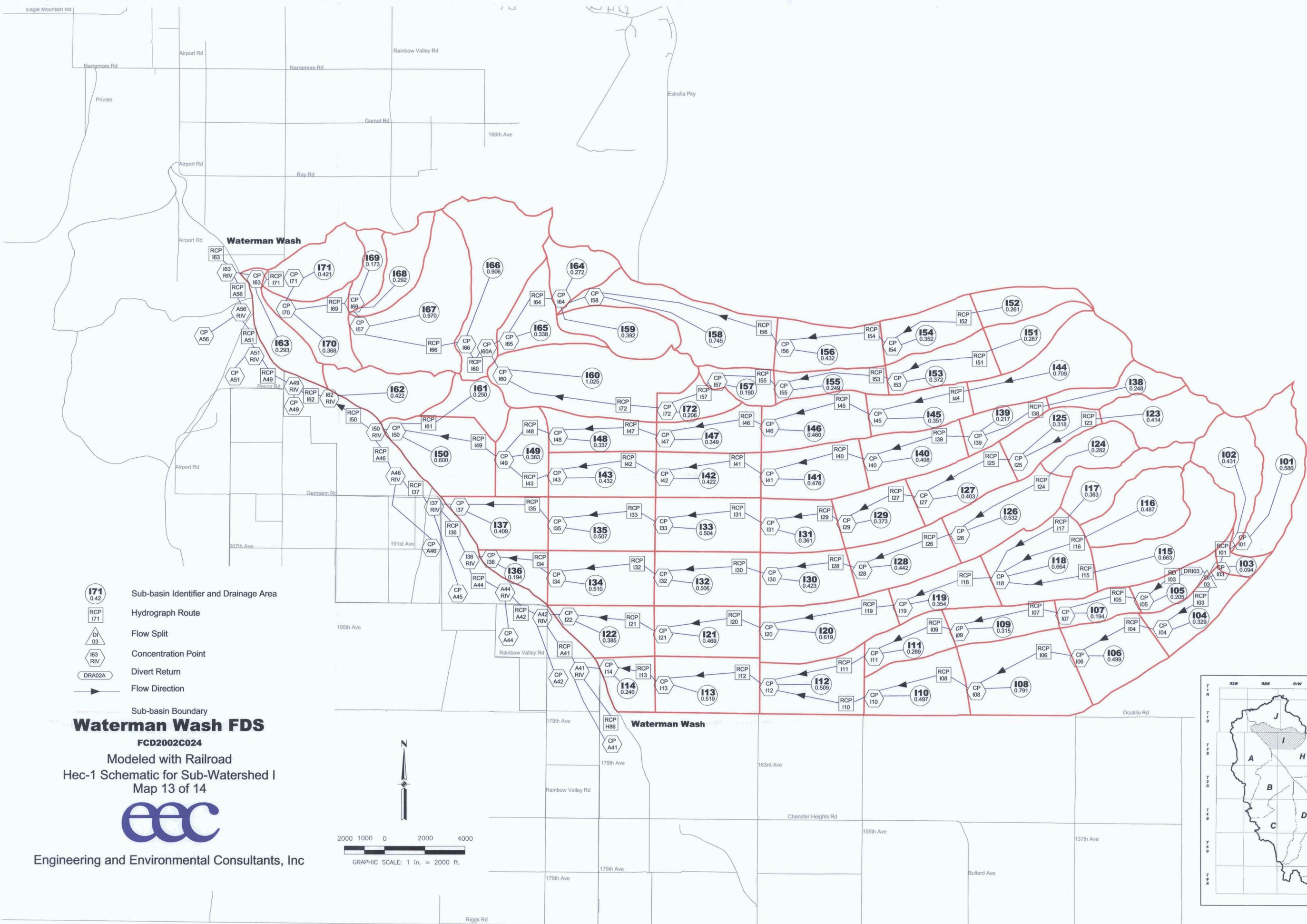
1" = 2,000'

2000 0 2000 4000 Feet



Legend

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary



- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

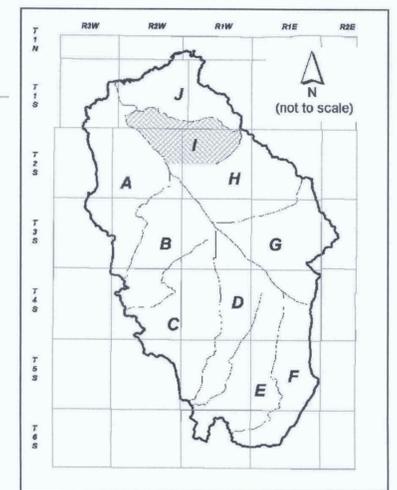
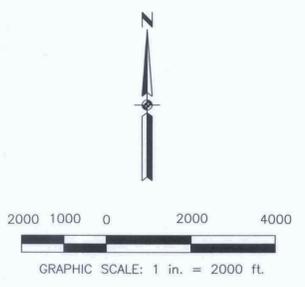
Waterman Wash FDS

FCD2002C024

Modeled with Railroad
Hec-1 Schematic for Sub-Watershed I
Map 13 of 14



Engineering and Environmental Consultants, Inc



Waterman Wash FDS

FCD 2002C024

Modeled with Railroad

HEC-1 Schematic for Watershed "J"

Map 14 of 14



Engineering and Environmental Consultants, Inc



1" = 2,000'

2000 0 2000 4000 Feet

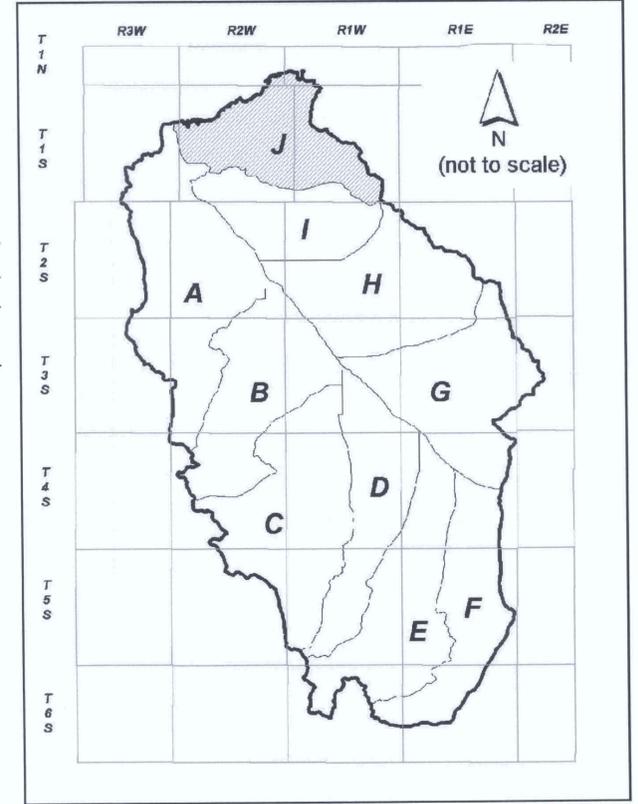
Us Highway 85

Perryville Rd

Vineyard Rd

Rainbow Valley Rd

Estrella Pky



Legend

- Sub-basin Identifier and Drainage Area
- Hydrograph Route
- Flow Split
- Concentration Point
- Divert Return
- Flow Direction
- Sub-basin Boundary

