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**FLOOD STUDY
TECHNICAL DATA NOTEBOOK**

for

**WHITE TANKS/AGUA FRIA
AREA DRAINAGE MASTER STUDY**

**APPENDIX D
VOLUME 5 OF 15**

MANNING'S N-VALUE PICTURE DOCUMENTATION

Prepared for:
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

Prepared by:
**THE WLB GROUP, INC.
333 East Osborn Road, Suite 380
Phoenix, Arizona 85012
(602) 279-1016**

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**GENERAL PICTURE DOCUMENTATION
DEPICTING VARIOUS ELEMENTS OF
THE WHITE TANKS/AGUA FRIA
ADMS STUDY AREA**



Looking east along Camelback Road downstream of
Litchfield Park Dam.



Looking north on Camelback Road upstream toward
Litchfield Park Dam.



Ponding upstream of Litchfield Park Dam.



Low flow outflow from Litchfield Park Dam.



Roosevelt Canal Looking West at Cotton Lane



Roosevelt Canal Looking North Toward Phoenix Trotting
Park at Cotton Lane



Buckeye Canal Looking West



Buckeye Canal Looking North



Buckeye Canal



Buckeye Canal



Typical Intersection



Typical Intersection



Typical Intersection



Typical Intersection



Typical Intersection



Typical Intersection

**HYDROLOGIC PICTURE
DOCUMENTATION OF
MANNINGS "N" VALUES**



Looking south along Reems Road at Northern Avenue.
Typical "n" along road: Left = .04 - .075, Channel = .022,
Right = .035 - .075 "n" Values in fields range from .05 - .08.



Berm around southeast corner of Olive Avenue and Reems Road.
Approximately 3 feet high. There are several locations around irrigated
fields where this berming occurs.



Typical tailwater ditch at the end of a farm field.
Typical "n" Values: Left = .022, Channel = .05, Right = .075



Typical Agricultural Reservoir
Typical "n" Values: Left = .08, Channel = .03, Right = .08



Typical Fallow Agricultural Area
Typical "n" Value = .04



Typical Fallow Agricultural Area
Typical "n" Value = .05



Tailwater Ditch
Typical "n" Values Left = .03, Channel = .03, Right = .03



Ponding Behind Litchfield Park Dam



Tailwater Ditch
Typical "n" Values Left = .025, Channel = .04, Right = .03



Camelback Road Just North of Litchfield Park
Typical "n" Values Left = .05 - .06, Channel = .03, Right = .02



Wash Downstream of Litchfield Park
Dam Looking North
Typical "n" Values Left = .06, Channel = .03, Right = .06



Wash Downstream of Litchfield Park
Dam Looking South
Typical "n" Values Left = .06, Channel = .03, Right = .06



Farm Field
Typical "n" Value = .075



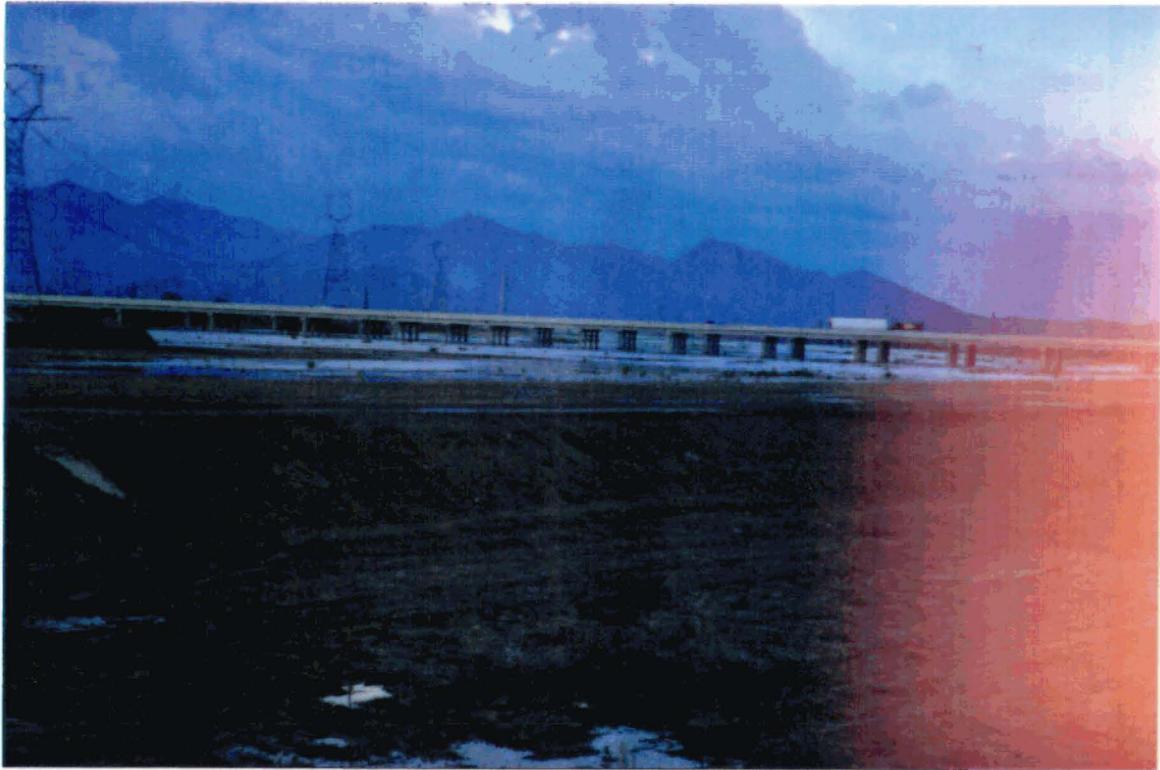
Camelback Road Looking West
Typical "n" Values Left = .03, Channel = .025, Right = .022



Camelback Road Channel
North Side Looking East
Typical "n" Value = .03



Indian School Road Looking East
Typical "n" Value = .03



Agua Fria River at I-10
Typical "n" Value = .035



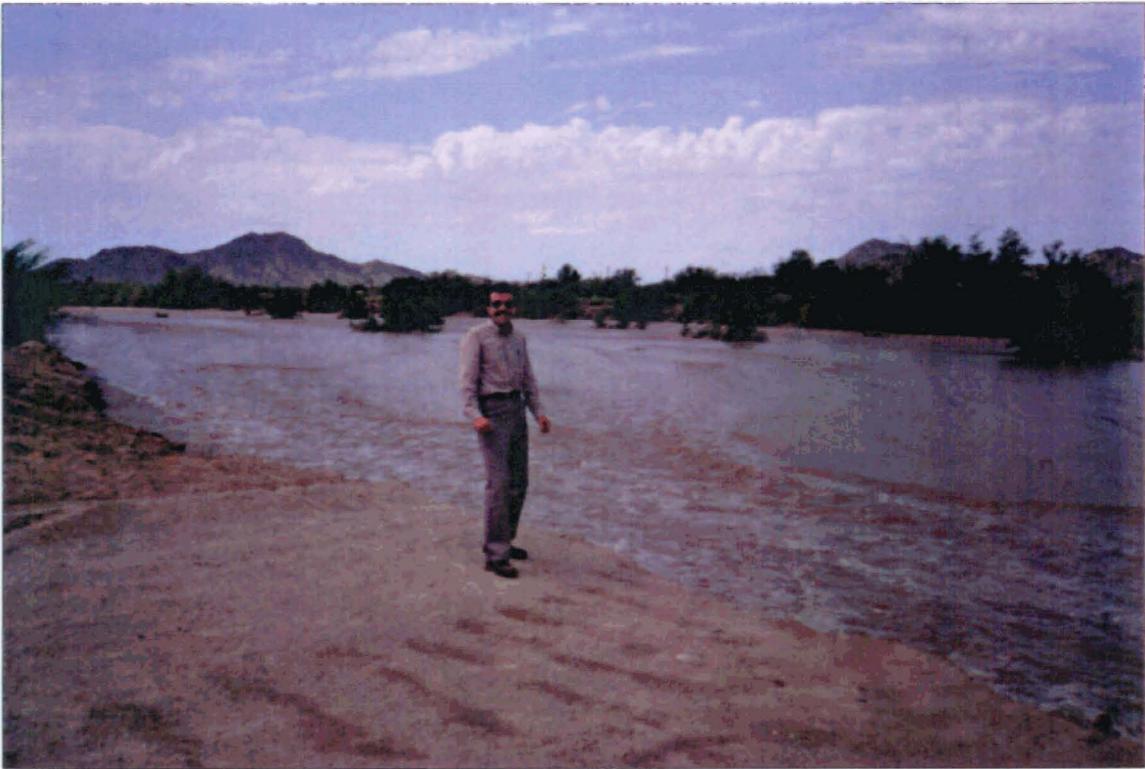
Agua Fria River
Typical "n" Value = .035



I-10 Bridge at Roosevelt Canal - Looking North
Typical "n" Value: Left = .04, Channel = .05, Right = .022



I-10 Bridge at Roosevelt Canal - Looking North
Typical "n" Value: Left = .04, Channel = .05, Right = .022



Typical Larger Wash
Typical "n" Values Left = .06, Channel = .035, Right = .06



Typical Larger Wash
Typical "n" Values Left = .06, Channel = .035, Right = .06



Typical Roadway Ditch
Typical "n" Value = .035



Typical Intersection



Typical Agricultural Fallow Field
Typical "n" Value = .05



Typical Desert Area
Typical "n" Value = .04



Typical Farm Field
Typical "n" Value = .085



Gila River
Typical "n" Values Left = .12, Channel = .035, Right = .12



Gila River
Overbank Flow Area



Reems Road Looking South
Typical "n" Values: Far Left = .07, Left = .035, Channel = .03,
Right = .035, Far Right = .07



Reems Road Looking South
Typical "n" Values: Left = .10, Channel = .035, Right = .035,
Far Right = .07



Typical Farm Field
Typical "n" Value = .075



Typical Farm Field
Typical "n" Value = .075



Typical Farm Field
Typical "n" Value = .075



Typical Farm Field
Typical "n" Value = .075



Typical Farm Field
Typical "n" Value = .12



Typical Farm Field
Typical "n" Value = .12



Farm Field Recently Planted to Cotton
Typical "n" Value: .04



Typical Desert Rangeland - Approximately 10% - 15% Cover
Typical "n" Value: .03



Typical Fallow Farm Land
Typical "n" Value = .04



Typical Desert Area
Typical "n" Value = .04



Typical Desert Area in White Tank Mountains
Typical "n" Value = .05



Typical Desert Area
Typical "n" Value = .04



Typical Desert Area
Typical "n" Value = .03



Typical Farm Field
Typical "n" Value = .075



Typical Desert Area in White Tank Mountains
Typical "n" Value = .05



Typical Desert Area
Typical "n" Value = .08

**HYDRAULIC PICTURE
DOCUMENTATION OF
MANNINGS "N" VALUES**



Wash 1 - Beardsley Canal Wash Upstream of Northern Avenue
Typical "n" Values: Left = .06, Channel = .035, Right = .06



Wash 1 - Beardsley Canal Wash Upstream of Northern Avenue - West Overbank
Typical "n" Value: .07



Wash 1 - Beardsley Canal Wash - Looking North of Peoria Avenue
Typical "n" Value: .05



Wash 1 - Beardsley Canal Wash - Looking South - Channel and West Overbank
Typical "n" Value: Channel = .035, Right = .07



Wash 1 - Beardsley Canal Wash - Looking North of Northern Avenue
Along West Side of Beardsley Canal
Typical "n" Values: Left = .05, Channel = .045, Right = .05



Wash 1 - Beardsley Canal Wash - Looking South Along the West Side of
Beardsley Canal Toward White Tank Structure #3
Typical "n" Values: Left = .035, Channel = .035, Right = .035



Wash 1 - Beardsley Canal Wash Downstream of Northern -
Looking South to White Tank Structure #3
Typical "n" Values: Left = .04, Channel = .02 - .04, Right = .04



Wash 1 - Beardsley Canal Wash - Looking South at Olive Avenue
Typical "n" Values: Left = .06, Channel = .05, Right = .07



Wash 1 - Beardsley Canal Wash Looking South at Olive Avenue - West Overbank
Typical "n" Value: .05



Wash 1 - Beardsley Canal Wash - West Overbank Looking South
Typical "n" Value: .05



Breakout Flow from Wash 1 to the East Along Olive Avenue at Beardsley Canal
Typical "n" Values: Left = .08, Channel = .035, Right = .025



Wash 1A - Cholla Wash - Looking South of Olive - West Overbank
Typical "n" Value: .04 - .06



Wash 1A - Cholla Wash - Looking Northwest of Olive Avenue - East Overbank
Typical "n" Value: .06 - .08



Wash 1A - Cholla Wash - Looking Southeast of Olive Avenue
Typical "n" Values: Left = .08, Channel = .035, Right = .08



Wash 1A - Cholla Wash - Left Overbank Upstream of Olive Avenue
Typical "n" Values: .06 - .08



Wash 1A - Cholla Wash - Looking North - Northwest of Olive Avenue
Typical "n" Values: Left = .06 - .08, Channel = .03 - .04, Right = .06 - .08



Wash 1B - Waterfall Wash - West Overbank Looking North
Typical "n" Value: .05



Wash 1B - Waterfall Wash - Looking North - North of Olive Avenue
Typical "n" Values: Left = .08, Channel = .04, Right = .06



Wash 2 - White Tank #3 Wash - Looking Northwest - North of Northern Avenue
Typical "n" Values: Left = .08, Channel = .035, Right = .07



Wash 2 - White Tank #3 Wash - West Overbank Looking North
Typical "n" Value: .05



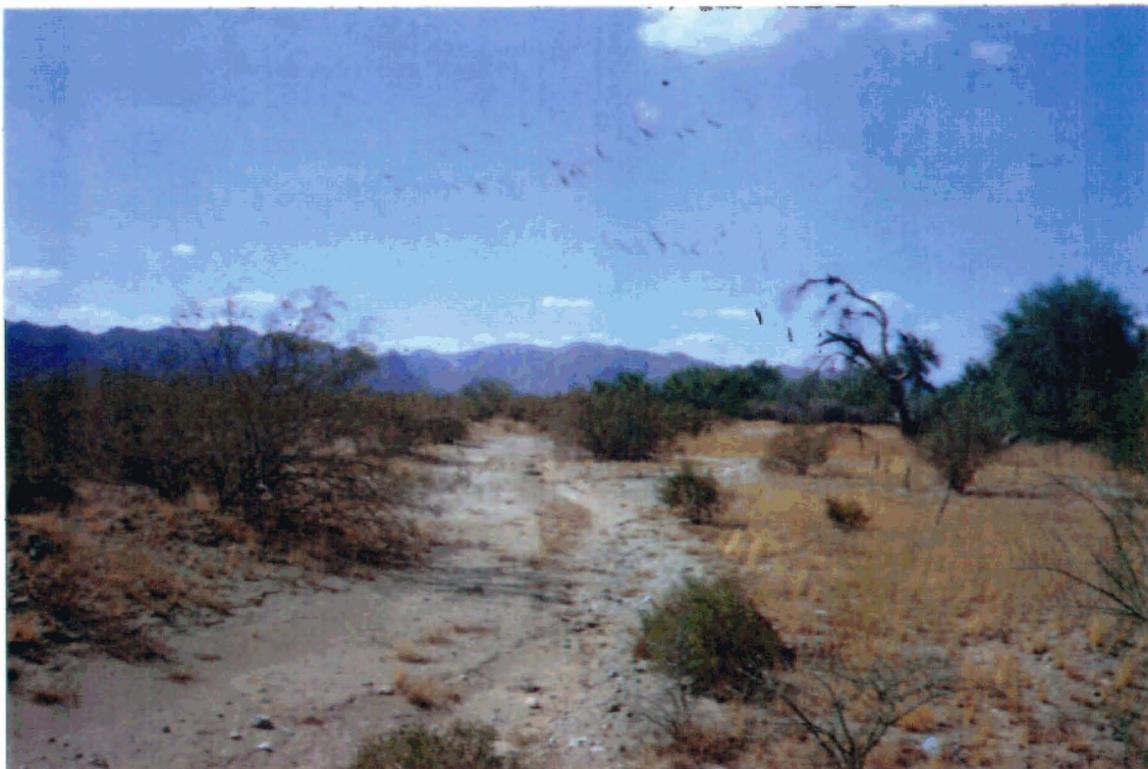
Wash 2 - White Tank #3 Wash - Wash Flowing into White Tank Structure #3
Typical "n" Values: Left = .05, Channel = .035, Right = .06



Wash 2 - White Tank #3 Wash - Same Wash as Above Showing Size of Stones
in the Channel Bed



Wash 2, 3, 3A - Typical Wash on Case Proving Ground
Typical "n" Values: Left = .07, Channel = .035, Right = .07



Wash 3 - Bedrock Wash - Looking Northwest - Overbank Area
Typical "n" Value: .04



Wash 3A - Bedrock Wash Tributary - Looking Northwest
Typical "n" Values: Left = .08, Channel = .04, Right = .08



Wash 3A - Bedrock Wash Tributary - Overbank Area Looking Northwest
Typical "n" Value: .08



Wash 4 - Jackrabbit Trail Wash - North of Indian School Road
Typical "n" Values: Left = .06, Channel = .04, Right = .06



Wash 4 - Jackrabbit Wash Looking North to Interstate 10 from
just Upstream of White Tanks Structure #4
Typical "n" Values: Left = .04, Channel = .025, Right = .035



Wash 4 - Jackrabbit Trail Wash and Dike Looking South Towards Interstate 10
Typical "n" Values: Left = .035, Channel = .035 - .05, Right = .04 - .08



Wash 4 - Jackrabbit Trail Wash - Looking North on Caterpillar Proving Ground
Typical "n" Values: Left = .04, Channel = .06, Right = .05



Wash 4 - Jackrabbit Trail Wash - North of Indian School Road
Typical "n" Values: Left = .05, Channel = .035



Wash 4 - Jackrabbit Trail Wash - Looking Southeast Toward Road South
of Camelback Road
Typical "n" Values: Left = .06, Channel = .035, Right = .04



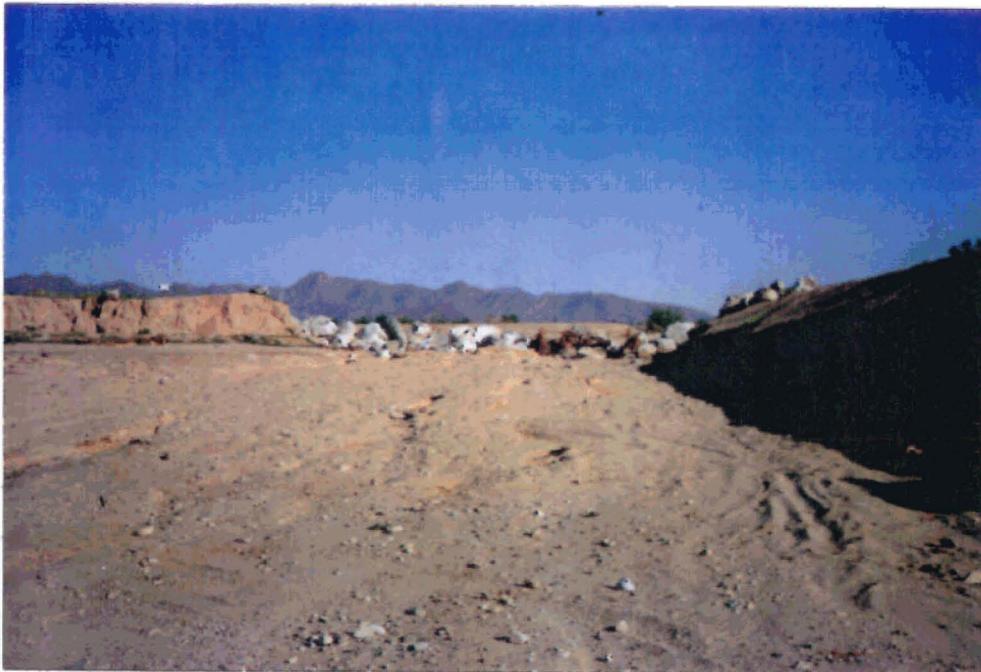
Wash 5 - Tuthill Dike Wash - Looking North at Caterpillar Proving Grounds
Typical "n" Values: Left = .055, Channel = .03, Right = .035



Wash 5 - Tuthill Dike Wash - Looking North from White Tanks Structure #4
Typical "n" Values: Left = .05, Channel = .035, Right = .05



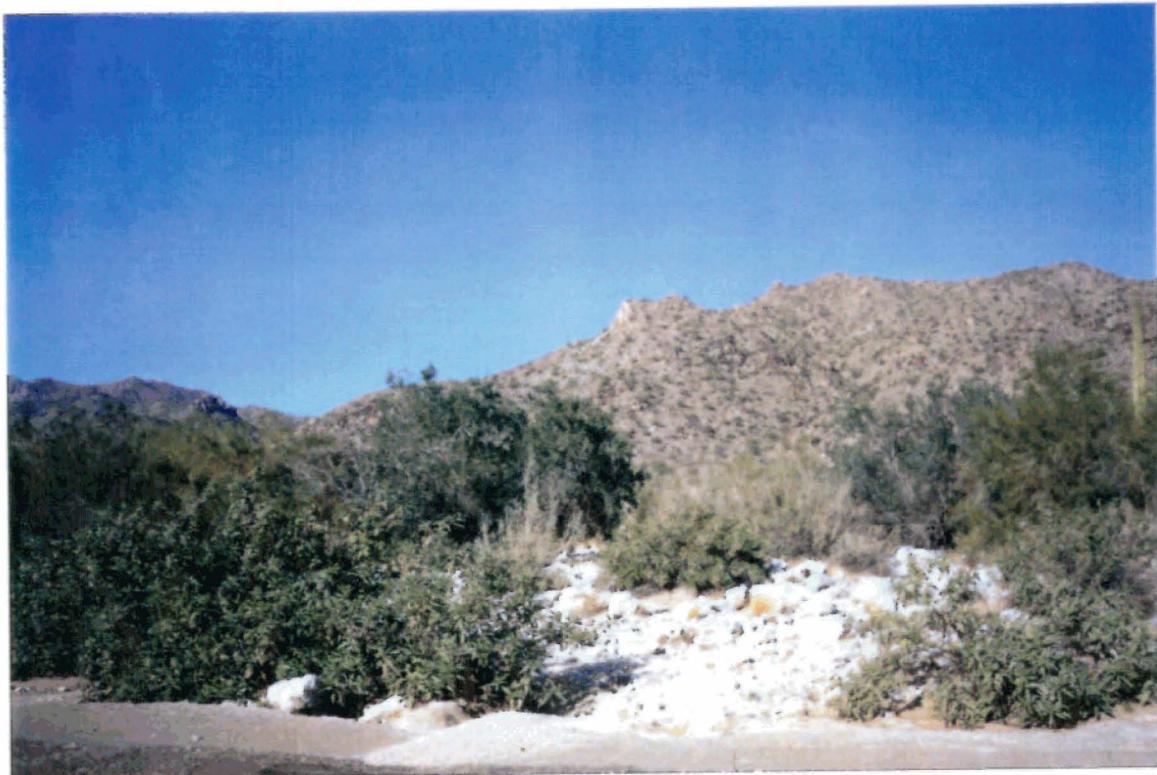
Wash 5A - 5E1 - Typical Wash in Alluvial Fan Area
Typical "n" Values: Left = .06, Channel = .035, Right = .06



Wash 5 - Tuthill Dike Wash - Looking North in the Most Southeastern
Tank on Caterpillar Proving Grounds
Typical "n" Values: Left = .035, Channel = .035, Right = .035



Wash 5A-5E1 - Typical Washes in This Area
Typical "n" Values: Left = .08, Channel = .05, Right = .08



Wash 5A.5E1 - Typical of Washes in This Area
Typical "n" Values: Left = .10, Channel = .07, Right = .10



Wash 6 - 191st Avenue Wash - South of Indian School Road
Typical "n" Values: Left = .04, Channel = .08, Right = .06



Wash 6 - 191st Avenue Wash - Upstream of Indian School Road
Typical "n" Values: Left = .08, Channel = .06, Right = .07



Wash 6 - 191st Avenue Wash - North of Indian School Road - West Overbank
Typical "n" Value: .08



Wash 7 - Perryville Road Wash - Breakout at Olive Avenue Looking East
Typical "n" Values: Left = .06, Channel = .06, Right = .06



Wash 7 - Perryville Road Wash - Breakout to the East Along
Northern Avenue at Beardsley Canal
Typical "n" Values: Left = .08, Channel = .05, Right = .025



Wash 8 - AT&SF Railroad Along Cotton Lane - Breach in AT&SF Railroad Tracks
South of Northern Avenue Along the West Side of Cotton Lane
Typical "n" Values: Left = .06, Channel = .05, Right = .06



Wash 8 - Along AT & SF Railroad West of Cotton Lane
Typical "n" Value: Left = .035, Channel = .035, Right = .06



Wash 9 - Along AT & SF Railroad West of Cotton Lane
Typical "n" Value: Left = .03, Channel = .03, Right = .05



Wash 9 - Cotton Lane - Looking South
Typical "n" Value: .02



Wash 9 - Cotton Lane - Looking South - West Overbank and Channel
West of AT&SF Railroad
Typical "n" Values: Left = .03, Channel = .05, Right = .04



Wash 10 - Bullard Wash - Reems Road Looking South to the Gila River
Typical "n" Values: Left = .06, Channel - .025, Right = .06



Wash 10 - Bullard Wash - Looking North Along Drainage Ditch Portion of
Bullard Wash



Wash 10 - Bullard Wash - Looking South Along Drainage Ditch Portion
of Bullard Wash



Wash 10 - Bullard Wash - Bullard Avenue and McDowell Road - Looking South
to Interstate 10
Typical "n" Values: - Left = .075, Channel = .025, Right = .05



Wash 10 - Bullard Wash - Looking South to Interstate 10 Bridges
Typical "n" Values: Left = .035, Channel = .035, Right = .035



Wash 17 - Dysart Drain - Looking West to Reems Road
Typical "n" Value: Channel - .040



Wash 12 - Delineation Behind Grand Avenue and AT & SF Railroad -
Agua Fria River to Bell Road
Typical "n" Values: Left = .04, Channel = .025, Right = .06



Wash 13 - Lower El Mirage Wash Downstream
of El Mirage Road
Typical "n" Values: Left = .08, Channel = .12, Right = .08



Wash 13 - Lower El Mirage Wash
Typical "n" Values: Left = .10, Channel = .05, Right = .10



Wash 13A - Lower El Mirage Wash Tributary
Typical "n" Values: Left = .07, Channel = .07, Right = .07



Wash 17-Dysart Drain - Concrete Lined Channel Looking Upstream
Typical "n" Value: Left = .035, Channel = .016, Right = .025



Wash 17-Dysart Drain - Concrete Lined Channel Looking Downstream
Typical "n" Value: Left = .035, Channel = .016, Right = .025



Wash 17 - Dysart Drain - Looking West to Reems Road - North Overbank
Typical "n" Values: Left = .025, Channel = .040, Right = .03



Wash 21 - Litchfield Park Dam Wash - Looking Southwest at New
Litchfield Park Detention Facility



Wash 18, 19, & 20 - Along AT & SF Railroad
Typical "n" values: Left = .035, Channel = .035, Right = .035



Wash 18 - Downstream of Olive Avenue
Typical "n" Values: Left = .03, Channel = .06, Right = .08
(Assumes Crop is Planted in Right Overbank)



Wash 21 - Litchfield Wash Looking Upstream
Typical "n" Values: Left = .03, Channel = .04, Right = .05



Wash 21 - Litchfield Wash Looking Downstream
Typical "n" Values: Left = .04, Channel = .05, Right = .04



Wash 21 - Litchfield Park Dam Wash - Looking Northwest at New
Litchfield Park Detention Facility