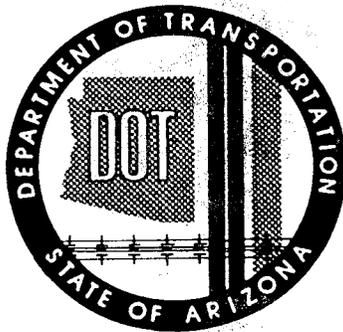


NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (N P D E S)

PART 1 PERMIT APPLICATION
FOR THE
PHOENIX AND TUCSON
METROPOLITAN AREAS



ARIZONA DEPARTMENT
OF
TRANSPORTATION

NOVEMBER 1991

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Appendix D: Photographs of Field Screening Locations - Phoenix Area

Appendix E: Photographs of Field Screening Locations - Tucson Area

1.0 GENERAL INFORMATION

1.1 Applicant and Contact Person

Applicant: Arizona Department of Transportation (ADOT)
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Phoenix, Arizona 85007-3213

Contact Person: Mr. Roland Tang
Arizona Department of Transportation
Environmental Planning Services
205 South 17th Avenue
Room 240 E
Phoenix, Arizona 85007-3212
(602) 255-7769

1.2 Ownership Status and Application Type

Ownership Status: Arizona Department of Transportation
State Government

Application Type: Individual

In both the Phoenix and Tucson Metropolitan Areas, ADOT's storm drainage system is extensively interconnected with the municipalities storm sewer system. It is ADOT's understanding that the municipalities and counties

within the State that are required to submit NPDES permit applications are all doing so on an individual basis as is ADOT. Those municipalities include the Cities of Phoenix, Tucson, Mesa, and Tempe and Pima County.

A thorough attempt has been made in the preparation of this application to clearly identify the ADOT owned storm drainage facilities and where they discharge to waters of the U.S. (refer to Section 3). ADOT has also endeavored to identify locations where ADOT's storm drainage system interconnects with the adjacent municipalities.

1.3 Roadways Covered by Application

Included in this application are ADOT's roadways and drainage systems within the Metropolitan Areas of Phoenix and Tucson. The limits of the roadways covered in this application extend to and in some cases beyond the boundaries of the municipalities and counties within the State of Arizona which are required to submit a NPDES permit application.

1.3.1 Phoenix Metropolitan Area (Refer to the following map which shows the limits of the application.)

In the Phoenix Area, the application covers ADOT's facilities which are within the Cities of Phoenix, Tempe, and Mesa. All three of these municipalities have been identified by the EPA as having populations greater than 100,000 and are required to submit applications.

The application also covers areas beyond the boundaries of Phoenix, Tempe and Mesa which are urban in character and which include municipalities which may be required to submit an application either as a result of the 1990 census or as a result of having interconnected storm sewers with the larger cities.

The following is a list of ADOT's roadways which are included in this application for the Phoenix Area.

1. Interstate 10 - Agua Fria River to Pecos Road (Gila River Indian Reservation)
2. Interstate 17 - Interstate 10 to Dixileta Drive (Phoenix City Limit)
3. State Route 360 - Interstate 10 to Maricopa County Line (Mesa City Limit)
4. Loop 101
5. State Route 143
6. State Route 51
7. Loop 202

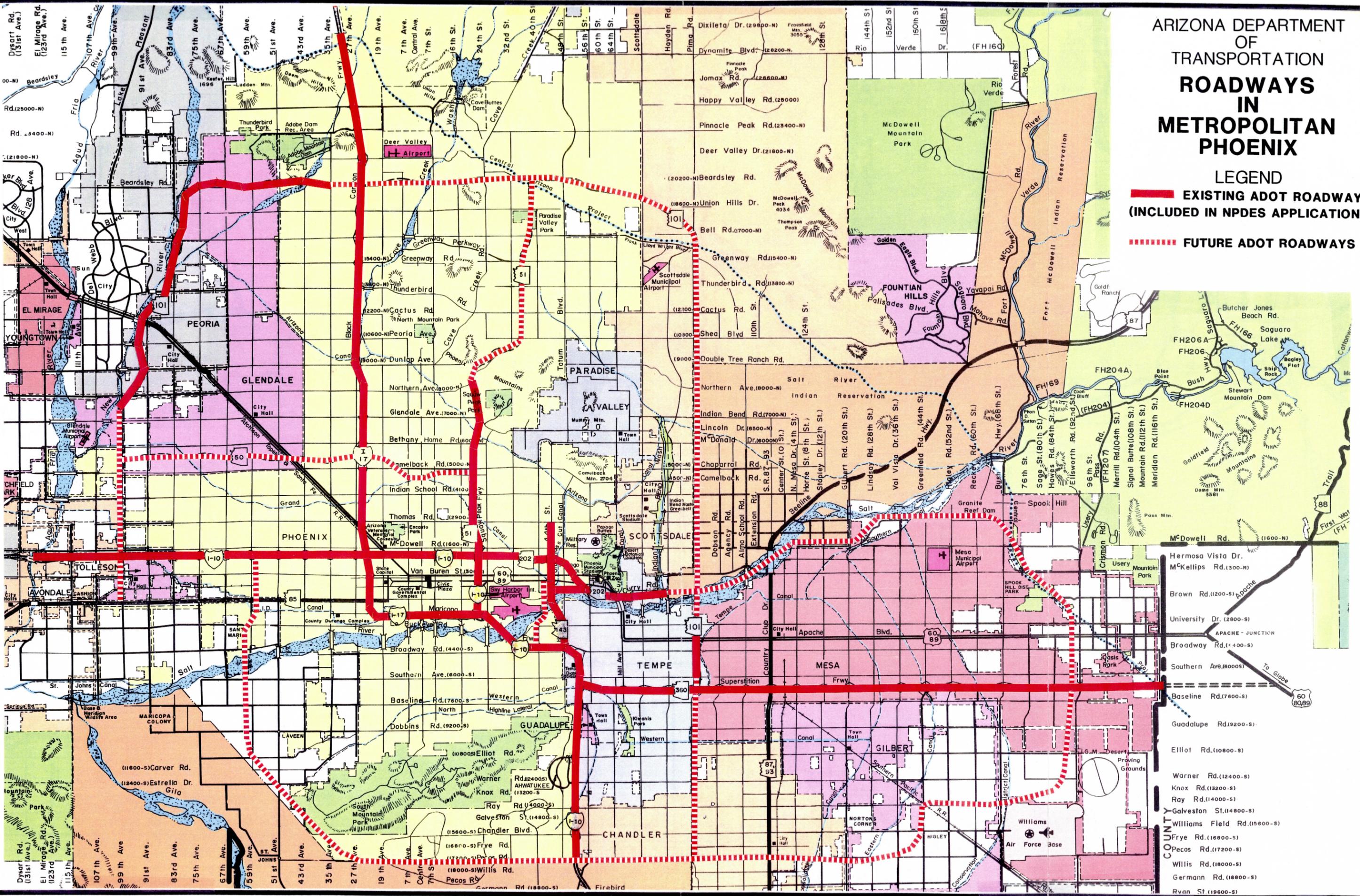
Loop 101, Loop 202, State Route 143, and State Route 51 are all urban highways which are only partially completed. For purposes of this application, only the portions which are completed or which are currently under construction are included herein.

The portion of State Route 51 (Squaw Peak Parkway) between I-10 and Glendale Avenue is currently a City of Phoenix owned facility. It has been included in this application because ADOT has agreed to take it into the State system at a future unspecified date.

The other State owned highways in the Phoenix Area include Buckeye Road (S.R. 85), Grand Avenue (U.S. 60, 89), Apache Boulevard (U.S. 60, 89), Country Club Drive (S.R. 87), and Arizona Avenue (S.R. 87). ADOT is not aware of any major outfalls that are located in these roadways, therefore, they were not included in the application and are not shown on the "Drainage System and Major Outfall" maps presented herein.

ARIZONA DEPARTMENT
OF
TRANSPORTATION
**ROADWAYS
IN
METROPOLITAN
PHOENIX**

LEGEND
 **EXISTING ADOT ROADWAYS
(INCLUDED IN NPDES APPLICATION)**
 **FUTURE ADOT ROADWAYS**



- FH206A
- FH206
- FH204A
- FH204
- FH204D
- FH169
- FH207
- FH204
- FH207
- Signal Butte (108th St.)
- Mountain Rd. (112th St.)
- Meridian Rd. (116th St.)
- McDowell Rd. (1600-N)
- Hermosa Vista Dr.
- McKellips Rd. (300-N)
- Brown Rd. (1200-S)
- University Dr. (2800-S)
- Broadway Rd. (1400-S)
- Southern Ave. (6000-S)
- Baseline Rd. (7600-S)
- Guadalupe Rd. (9200-S)
- Elliott Rd. (10800-S)
- Warner Rd. (12400-S)
- Knox Rd. (13200-S)
- Ray Rd. (14000-S)
- Galveston St. (14800-S)
- Williams Field Rd. (15600-S)
- Frye Rd. (16800-S)
- Pecos Rd. (17200-S)
- Willis Rd. (18000-S)
- Germann Rd. (18800-S)
- Ryan St. (19600-S)

1.3.2 Tucson Metropolitan Area (Refer to the map on the following page)

The Tucson Metropolitan Area includes both the City of Tucson and Pima County, both of which are required to submit NPDES permit applications. The limits of the roadways included in this application correspond to the study area limits called out in Pima County's application.

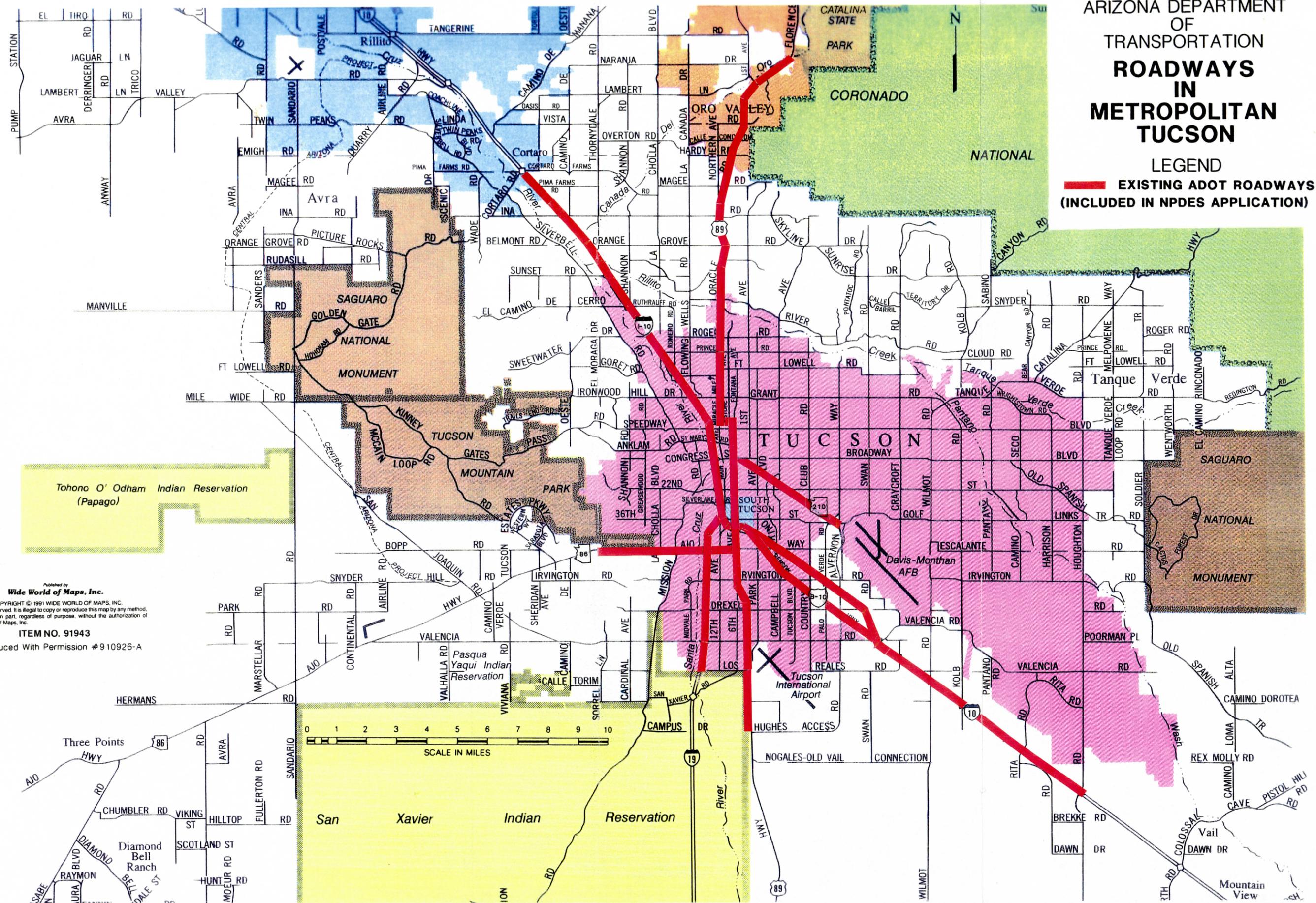
The following is a list of ADOT's roadways which are included in this application for the Tucson Metropolitan Area.

1. Interstate 10 - Cortaro Farms Road to Houghton Road
2. Interstate 19 - Interstate 10 to San Xavier Indian Reservation
3. U.S Route 89 - Catalina State Park to Hughes Access Road
4. State Route 86 - U.S. Route 89 to Robles Pass (Tucson Mountains)
5. Business 10
6. State Route 210

State Route 210 (Aviation Parkway) does not exist at this time and will not be under construction until 1992. However, the storm drains were constructed in advance of the roadway and, therefore State Route 210 was included on the "Drainage System and Major Outfall" maps presented herein.

ARIZONA DEPARTMENT
OF
TRANSPORTATION
**ROADWAYS
IN
METROPOLITAN
TUCSON**

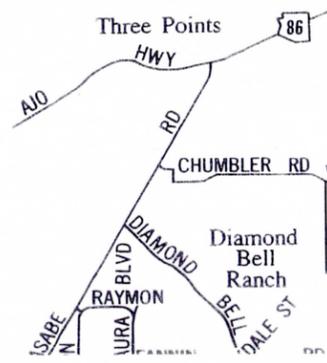
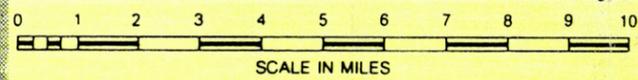
LEGEND
 EXISTING ADOT ROADWAYS
 (INCLUDED IN NPDES APPLICATION)



Tohono O'odham Indian Reservation
(Papago)

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2.0 LEGAL AUTHORITY

The legal authority vested in the Arizona Department of Transportation (ADOT) is contained in Title 28 (Transportation) of the Arizona Revised Statutes. As stated in Section 28-104(A), the Department has "exclusive operational control and jurisdiction over state highways, state routes, state airports and all state owned transportation systems or modes."

It is clear that the EPA's minimum requirements listed below were prepared for municipal and county governments. Therefore, some of the requirements that deal with the legal authority to exercise control over storm water discharges from privately held land or any lands outside of ADOT's right of way do not apply.

2.1 Response to EPA Requirements

The following paragraphs describe ADOT's legal authority with respect to EPA's minimum requirements listed at 40 CFR 122.26(d)(2)(i) (A) - (F). Appendix A contains copies of the referenced State Statutes and Rules.

- (A) *Legal authority in place which controls through ordinance, permit, contract, order or similar means, the contribution of pollutants to the municipal storm-sewer by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity.*

ADOT's jurisdiction is the State owned transportation facilities. Consequently, ADOT does not have control over land use and the quality of storm water from sites of industrial activity outside of the State owned right of way. That control and legal authority lies with the municipality or county where the industrial sites are located.

With respect to construction activities within ADOT's right of way, Section 107.15 of ADOT's 1990 Standard Specifications for Road and Bridge Construction, requires contractors to provide temporary and permanent erosion control. The Standard Specifications also prevent the contractor from polluting streams and lakes, including channels that lead to streams or lakes, with harmful materials.

In addition to the Standard Specifications, special provisions are included with most construction projects which detail the specific methods of permanent erosion control.

- (B) *Legal authority which prohibits illicit discharges to the storm sewer.*

ADOT has prescribed Rule 17-3-712, Encroachments into Highway Rights of Way, to establish permitting procedures to use the State Highway Right of Way. This rule applies to connections to ADOT's storm sewer system. Applicants are required to provide plans and

drainage data in order to obtain a permit and ADOT policy requires that applicants comply with all existing and future NPDES water quality standards.

The rule also states that "Owners of unauthorized property located in the State highway right of way will be notified that they are in violation of State law. If the encroachment has not been removed within the time prescribed, the Director may remove the unauthorized encroachment, and the owner shall be liable for the cost of such removal."

- (C) *Legal authority to control the discharge to a municipal separate storm sewer of spills, dumping or disposal of materials other than storm water.*

Section 28-1873 of the Arizona Revised Statutes provides criminal penalties (Class 3 Misdemeanor) of fines and imprisonment for dumping refuse, rubbish, debris and other substances on or within 20 yards of the State Highways.

With respect to accidental spills, the State of Arizona has an emergency plan in place to respond to spills on the highways. Refer to Section 5 entitled Management Programs.

- (D) *Legal authority to control, through interagency agreements, the contributions of pollutants from one part of the storm sewer system to another portion of the system.*

Section 28-108(18) gives the Director of ADOT the power to enter into interagency agreements.

- (E) *Legal authority which requires compliance with conditions in ordinances, permits, contracts or orders.*

AND

- (F) *Sufficient authority to carry out all inspection, surveillance and monitoring procedures necessary to ensure that permit and ordinance conditions are being complied with, including prohibiting illicit discharges to the storm sewer.*

Section 28-108 of the Arizona Revised Statutes gives the Director of ADOT the power to "Exercise complete and exclusive operational control and jurisdiction over the use of state highways and routes and prescribe such rules and regulations regarding such use as he deems necessary to prevent the abuse and unauthorized use of such highways and routes." This duty and power gives the Director the authority to carry out all inspection, surveillance and monitoring

procedures necessary to ensure that all laws, rules, and regulations are being complied with. It also gives the Director the authority to require compliance with all contracts and rules.

2.2 Additional Legal Authority

No additional legal authority is required. ADOT has all the necessary legal authority to control the quality of storm water discharges from ADOT roadways.

With respect to discharges from the adjacent municipalities into ADOT's storm sewer system, the legal authority to control the quality of storm water lies with the municipality.

3.0 SOURCE IDENTIFICATION

As stated in the EPA guidance manual for preparing this application, the intent of this section is to identify possible sources of pollutants to the storm sewer system. The regulation requires information on prohibited discharges to the sanitary sewer and information on sources of storm water to the storm sewer system.

The purpose of identifying prohibited discharges to the sanitary sewer is to locate them as possible illicit discharges to the storm sewer. In ADOT's case, since ADOT is not a municipality and does not own any waste water treatment plants within the Metropolitan Areas of Phoenix and Tucson, this requirement does not apply.

With respect to providing information on sources of storm water, ADOT's only contribution is roadway drainage. Consequently, much of the required information does not apply to ADOT; such as describing land use, estimating population densities, locating landfills, identifying existing NPDES permitted discharges, and identification of publicly owned lands. There are many instances, however, where ADOT's drainage system accepts storm water flows from the adjacent municipalities. For these cases, the required land use descriptions can be found in the permit applications for each municipality.

In order to clearly identify sources of storm water to ADOT's storm drainage facilities, the maps entitled "Drainage System and Major Outfalls" are provided with this application to present the following information.

Major Outfalls - ADOT owned storm drains, 36" or larger, that discharge to waters of the U.S.

Drainage System - A schematic of ADOT's drainage system that shows the main storm drains, open channels, detention basins, retention basins, and cross drainage structures.

Interconnections - All of the storm drainage interconnections are shown that are 36 inches in diameter or larger (i.e., all locations where the municipalities discharge to ADOT's drainage system and visa versa.)

3.1 Phoenix Metropolitan Area Drainage System and Major Outfalls

The maps in Appendix B identify the major outfalls, present a schematic of the drainage system and show interconnections with the adjacent municipalities. The following table is a summary of the major outfalls owned by ADOT.

As can be seen from the enclosed maps, there are several cases where ADOT's drainage system collects storm water runoff from large areas within the adjacent municipalities. For example, the Papago Channel and the East and West Tunnels provide an outfall for numerous City of Phoenix storm sewers. Also, the channel along the north side of State Route 360 (Superstition Freeway) conveys much of Mesa's storm water and, to a lesser extent, Tempe's storm water. As stated previously, this application does not attempt to classify and identify the source of this

storm water from the adjacent municipalities, other than to indicate which City it comes from. It is ADOT's understanding that the adjacent municipalities will be providing information as to drainage area, land use, potential sources of pollutants, etc.

MAJOR STORM SEWER OUTFALLS (Phoenix Metropolitan Area)												
Outfall Identifier	Storm Sewer Data			Location Data					Construction Plan Data			
Route No. - Mile Post	Type	Size/ Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates		City	Project I.D. No.	Project Station	Offset L/R
							North	East				
10-130.3 (Papago Channel)	Trapezoidal Open Channel	TW=80' D=10'	Concrete	I-10 Papago Freeway	Agua Fria River	1/2 Mile W. of E1 Mirage Rd. & 100' N. of I-10.	894900	374000	Avondale	I-10-2(75)	6869+10	L
10-145.17 (West Tunnel)	Circular Tunnel	DIA=21'	Concrete	I-10 Papago Freeway	Salt River	Central Ave.-W. side @ N. bank of Salt River.	882000	452300	Phoenix	I-10-3(223)	7667+00	R
10-149.18 (East Tunnel)	Circular Tunnel	DIA=21'	Concrete	I-10 Papago Freeway	Salt River	20th St.-E. side @ N. bank of Salt River.	880500	462700	Phoenix	I-10-3(225)	7866+00	R
10-150.44	Circular Pipe	DIA=36"	Concrete	I-10 Maricopa Freeway	Salt River	N. Bank of Salt River @ W. side of I-10.	880300	468500	Phoenix	I-10-3(206)	7936+00	R
10-150.45	Dual Circular Pipes	DIA=72"	Concrete	I-10 Maricopa Freeway	Salt River	N. Bank of Salt River @ E. side of I-10.	880500	469100	Phoenix	I-10-3(206)	7936+00	L
10-151.06	Circular Pipe	DIA=66"	Concrete	I-10 Maricopa Freeway	Tempe - 48th St. Drain	N. Quadrant of I-10 & University Traffic Interchange.	878100	471100	Phoenix	I-10-3(206)	7945+00	L
17-198.48	Circular Pipe	DIA= 102"	Concrete	I-17 Black Canyon Freeway	Salt River	2200' S. of Buckeye Rd. & 1700' E. of 27th Ave.	878950	440900	Phoenix	I-17-1(9)	69+60	L 6000
51-5.45	Circular Pipe	DIA=36"	Concrete	S.R. 51 Squaw Peak Parkway	ACDC	300' N. & W. of Intersection of 18th St. & Ocotillo.	922300	461900	Phoenix	C.O.P. BR-885442	270+55	L
51-7.04	Circular Pipe	DIA=48"	Concrete	S.R. 51 Squaw Peak Parkway	Dreamy Draw Wash	400' S. & E. of Intersection of Northern Ave. & Squaw Peak Highway.	930600	463500	Phoenix	M-600-Z-502	84+50	L
101-7.76	Trapezoidal Open Channel	TW=82' D=8'	Concrete	Loop 101 Agua Fria Freeway	New River	1/4 Mile S. of North- ern Ave. & 1000' W. of 99th Ave.	927000	390800	Glendale	M-600-0-501	440+83	L 1650

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

MAJOR STORM SEWER OUTFALLS (Phoenix Metropolitan Area)

Outfall Identifier	Storm Sewer Data			Location Data					Construction Plan Data				
	Route No. - Mile Post	Type	Size/Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates		City	Project I.D. No.	Project Station	Offset L/R
								North	East				
101-10.84	Trapezoidal Open Channel	TW=65' D=12'	Concrete & Soil Cement	Loop 101 Agua Fria Freeway	New River	1/2 Mile N. of Peoria Ave. along E. Bank of New River.	942500	394700	Peoria	M-600-0-502	603+68	L 920	
101-11.85	Trapezoidal Open Channel	TW=45' D=8'	Concrete	Loop 101 Agua Fria Freeway	New River	1/2 Mile S. of Thunderbird Rd. & 300' W.	947000	396500	Peoria	M-600-0-502	658+30	L 715	
101-13.44	Dual Circular Pipes	DIA=42"	Concrete	Loop 101 Agua Fria Freeway	Skunk Creek	200' S. of S.B. Bridge over Skunk Creek & 250'+ W.	953100	401600	Peoria	M-600-0-502	742+10	L 260	
101-13.68	Trapezoidal Open Channel	TW=22' D=4'	Concrete	Loop 101 Agua Fria Freeway	Skunk Creek	30' N. of N.B. Bridge over Skunk Creek & 80' E.	953900	402000	Peoria	M-600-0-502	750+84	R 135	
101-14.38	Open Channel	TW=28' D=10'	Concrete	Loop 101 Agua Fria Freeway	New River	1200' S. of Bell Rd. Traffic Interchange & 300' W.	958700	401800	Peoria	M-600-0-502	800+00	L 300	
101-15.18	Circular Pipe	DIA=48"	Concrete	Loop 101 Agua Fria Freeway	New River	4/10 Mile N. of Bell Rd. & 500' W.	962000	402600	Glendale	M-600-0-502	834+00	L 560	
101-16.31	Circular Pipe	DIA=48"	Concrete	Loop 101 Agua Fria Freeway	New River	4/10 Mile S. of Beardsley Rd. & 300' W.	967900	403900	Glendale	M-600-0-503	895+00	L 340	
101-16.62	Circular Pipe	DIA=48"	Concrete	Loop 101 Agua Fria Freeway	New River	2/10 Mile S. of Beardsley Rd. & 500' W.	969600	404700	Glendale	M-600-0-503	908+25	L 560	
101-16.74	Trapezoidal Open Channel	TW=56' D=11'	Concrete	Loop 101 Agua Fria Freeway	New River	150' S. of Beardsley Rd. & 2800' W. of 75th Ave.	970200	405000	Glendale	M-600-0-503	917+50	L 550	
101-20.19	Circular Pipe	DIA=36"	Concrete	Loop 101 Agua Fria Freeway	Skunk Creek	1/2 Mile S. of Beardsley Rd. at 51st Ave.	968500	423400	Phoenix	RBA-600-0-505	1098+50		
101-21.236	Circular Pipe	DIA=42"	Concrete	Loop 101 Agua Fria Freeway	Skunk Creek	245' E. of 43rd Ave. & N. side of Beardsley Rd.	971200	429900	Phoenix	RBA-600-0-505	1154+50		

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

MAJOR STORM SEWER OUTFALLS (Phoenix Metropolitan Area)

Outfall Identifier	Storm Sewer Data			Location Data					Construction Plan Data				
	Route No.- Mile Post	Type	Size/ Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates		City	Project I.D. No.	Project Station	Offset L/R
								North	East				
101-21.239	Trapezoidal Open Channel	TW=20' D=2'	Earthen	Loop 101 Agua Fria Freeway (Frontage Road)	Skunk Creek	260' E. of 43rd Ave. & N. side of N. Frontage Rd.	971200	429900	Phoenix	RBA-600-0-505	1154+65		
101-21.83	Circular Pipe	DIA=96"	Concrete	Loop 101 Agua Fria Freeway (Frontage Road)	Scatter Wash	2000' W. of 35th Ave. & S. side of S. Frontage Rd.	970900	431900	Phoenix	RBA-600-0-505	1186+00		
101-21.869	Circular Pipe	DIA=36"	Concrete	Loop 101 Agua Fria Freeway (Frontage Road)	Scatter Wash	1600' W. of 35th Ave. & N. side of N. Frontage Rd.	971300	432200	Phoenix	RBA-600-0-505	1187+00		
101-21.873	Trapezoidal Open Channel	TW=32' D=8'	Concrete	Loop 101 Agua Fria Freeway (Frontage Road)	Scatter Wash	1500' W. of 35th Ave. & N. side of N. Frontage Rd.	971300	432200	Phoenix	RBA-600-0-505	1188+00		
101-51.58 (Price Rd. Tunnel)	Circular Tunnel	DIA=18'	Concrete	Loop 101 Pima Freeway	Salt River	1 Mile N. of University Ave. & 200' E.	885400	508500	Tempe	M-600-1-507	2871+00	L 200	
143-2.90	Circular Pipe	DIA=66"	Concrete	S.R. 143 Hohokam Expressway	Old Cross Cut Canal	600' N. of Van Buren St. & 350' E. of S.R. 143 at Relocated Old Cross Cut Canal.	892400	480100	Phoenix	143-MA-H-0843-01D	166+71	R 350	
143-3.33	Trapezoidal Open Channel	TW=9' D=1'	Concrete	S.R. 143 Hohokam Expressway	Old Cross Cut Canal	350' N. of Loop 202 at W. bank of Relocated Old Cross Cut Canal.	894400	480000	Phoenix	143-MA-H-0843-01D	189-45	R 270	
202-3.57	Dual Box Culverts	TW=6' D=4'	Concrete	Loop 202 East Papago Freeway	Old Cross Cut Canal	N.E. Quadrant of S.R. 143 & Loop 202 Traffic Interchange @ bank of Relocated Old Cross Cut Canal.	894100	480100	Phoenix	202L-MA-H-0858-01D	34+60	L 163	
202-5.14	Trapezoidal Open Channel	TW=60' D=5'	Concrete	Loop 202 East Papago Freeway	Salt River	1800' S. of Washington St. & 2500' W. of 56th St.	887900	484200	Phoenix	202L-MA-H-0858-01D	112+00	R 290	

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

MAJOR STORM SEWER OUTFALLS (Phoenix Metropolitan Area)

Outfall Identifier	Storm Sewer Data			Location Data						Construction Plan Data		
Route No.- Mile Post	Type	Size/ Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates		City	Project I.D. No.	Project Station	Offset L/R
							North	East				
202-5.90	Circular Pipe	DIA=36"	Concrete	Loop 202 East Papago Freeway	Salt River	1000' E. of Priest Dr. and 2200' N. of 1st St.	885900	487700	Tempe	202L-MA-H- 0858-01D	148+80	R 280
202-7.44	Circular Pipe	DIA=48"	Concrete	Loop 202 East Papago Freeway	Salt River	1100' W. of Rural Rd. @ N. Bank of Salt River.	885100	496200	Tempe	202L-MA-H- 0858-01D	230+10	R 850
202-7.98	Dual Box Culverts	TW=8' D=8'	Concrete	Loop 202 East Papago Freeway	Salt River	1100' E. of Rural Rd. @ N. Bank of Salt River.	885300	498300	Tempe	202L-MA-H- 0858-01D	258+60	R 865
360-15.42	Trapezoidal Open Channel	TW=12' D=8'	Concrete	S.R. 360 Superstition Freeway	East Maricopa Floodway	1/2 Mile E. of Highley Rd. & S.R. 360 Traffic Interchange on N. side of S.R. 360.	868300	565800	Mesa	BP-028-1-509	815+80	L 65
360-17.63	Trapezoidal Open Channel		Concrete	S.R. 360 Superstition Freeway	Sossaman Channel	1/4 Mile E. of Soss- aman Rd. & S.R. 360 Traffic Interchange.	868100	569600	Mesa	F-028-1-514	939+80	L 130

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

3.2 Tucson Metropolitan Area Drainage System and Major Outfalls

The maps in Appendix C identify the major outfalls, present a schematic of the drainage system, and show interconnections with the adjacent municipalities. The following table is a summary of the major outfalls owned by ADOT.

ADOT's drainage system in the Tucson Area is much more rural in character than the Metropolitan Phoenix Area and is primarily composed of cross drainage structures which allow both natural arroyos and man-made channels to pass under the highways. This is a reflection of the general character of drainage in the Tucson Area which is mostly surface flow and open channel. However, there are some ADOT owned open channels and storm drain pipes which are shown on the enclosed maps.

The identification of major outfalls in the Tucson Area is somewhat more difficult than in the Phoenix Area because it is not always clear whether the receiving channel is considered a Water of the United States. The City of Tucson, for instance, has not tried to specifically identify the Waters of the United States. Therefore, the approach ADOT has taken to identify major outfalls is to designate any 36" pipe or larger (or any open channel with a drainage area of more than 50 acres) that discharges to the major water courses, including the Santa Cruz

River, Rillito River, Canada Del Oro, Julian Wash, Airport Wash, Railroad Wash, and Arroyo Chico. ADOT also included outfalls into several additional smaller open channels including Rodeo Wash and Bronx Wash.

The determining factor on the smaller open channels was whether or not the City of Tucson performed field screening in the open channel. If the City field screened locations in a channel, downstream of an ADOT outfall, then the ADOT outfall was treated as an interconnection with the City and was not identified as a major outfall. Conversely, if the City did not do instream field screening downstream, then the discharge point was considered to be a major outfall.

MAJOR STORM SEWER OUTFALLS (Tucson Metropolitan Area)												
Outfall Identifier	Storm Sewer Data			Location Data						Construction Plan Data		
Route No. - Mile Post	Type	Size/Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates		City	Project I.D. No.	Project Station	Offset L/R
							North	East				
10-260.7	Circular Pipe	DIA=72"	Concrete	I-10	Julian Wash	N. Side of Julian Wash at 10th Ave. S. of I-10.	433500	791750	Tucson	IR-10-5(54)	10th Ave 1+00	
10-261.5	Circular Pipe	DIA=78"	Concrete	I-10	Julian Wash	1400' W. of South Park Ave. & 1300' N. of Ajo Way - E. of SPRR.	430800	795750	Tucson	IR-10-5(54)	Line C 0+00	
10-264.6	Oval Pipe	56"x42"	Corrugated Metal	I-10	Julian Wash	1200' S. of I-10 & Palo Verde Rd. Traffic Interchange - W. side of Palo Verde & N. bank of Julian Wash.	422500	809500	Tucson	I-10-5(58)-28		
19-59.0	Circular Pipe	DIA=36"	Corrugated Metal	I-19 Nogales Freeway	Santa Cruz River	1200' S. of I-19 & Valencia Rd. Traffic Interchange S. of Valencia Rd. & E. bank of Santa Cruz River.	413400	787900	Tucson	I-19-1(15)	3105+01	L
19-61.7	Trapezoidal Open Channel	TW=10' D=2'	Concrete	I-19 Nogales Freeway	Rodeo Wash	900' S. of I-19 & Ajo Way Traffic Interchange - E. side of I-19 & S. bank of Rodeo Wash.	428700	788700	Tucson	I-19-1(15)	3270+80	R
86-171.1	Circular Pipe	DIA=36"	Corrugated Metal	S.R. 86 Ajo Highway	Santa Cruz River	1600' S. of I-19 & Ajo Way Traffic Interchange @ W. bank of Santa Cruz River S. of Ajo Way.	429500	786600	Tucson	S-222-14	1447+78	R
89-68.2	Circular Pipe	DIA=42"	Concrete	U.S. 89 Tucson - Florence Highway	Bronx Wash	W. of Oracle Rd. between Adams St. & Lee St.	452700	790250	Tucson	F-031-1-515	6+55	L

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

MAJOR STORM SEWER OUTFALLS (Tucson Metropolitan Area)

Outfall Identifier	Storm Sewer Data			Location Data				Construction Plan Data				
	Route No.- Mile Post	Type	Size/ Depth	Material	Route No. - Route Name	Receiving Water	Location	State Plane Coordinates North East		City	Project I.D. No.	Project Station
89-71.8	Circular Pipe	DIA=72"	Corrugated Metal	U.S. 89 Tucson - Florence Highway	Rillito River	S. bank of Rillito River E. of Oracle Rd.	471800	790250	Tucson	F-031-1(7)	197+89	R
89-78.7	Open Channel	TW=15' D=4'	Concrete	U.S. 89 Tucson - Florence Highway	Tributary of Canada Del Oro	S.E. Quadrant of U.S. 89 & Greenock Dr.	507400	794400	Oro Valley	F-031-1(11)	564+00	R
89-78.9	Circular Pipe	DIA=42"	Concrete	U.S. 89 Tucson - Florence Highway	Tributary of Canada Del Oro	N.E. Quadrant of U.S. 89 & Greenock Dr.	507900	794700	Oro Valley	F-031-1(11)	569+00	R
89-79.9	Open Channel	TW=25' D=8'	Concrete	U.S. 89 Tucson - Florence Highway	Tributary of Canada Del Oro	S.E. Quadrant of U.S. 89 & Hanley Rd.	511800	798200	Oro Valley	BP-031-1-513	620+55	R
89-80.8	Open Channel	TW=30' D=10'	Concrete	U.S. 89 Tucson - Florence Highway	Canada Del Oro	N.W. Quadrant of U.S. 89 and Canada Del Oro.	515300	802200	Oro Valley	BP-031-1-513	675+74	L
210-1.2	Circular Pipe	DIA=96"	Concrete	S.R. 210 Aviation Parkway	Arroyo Chico	S.E. of intersection of 10th St. & 3rd Ave.	445500	795000	Tucson	AZP-824-9-510	Line A 185+16	L 234
210-2.7	Circular Pipe	DIA=108"	Concrete	S.R. 210 Aviation Parkway	Railroad Wash	N.W. quadrant @ intersection of Campbell Ave. & Aviation Pkw.	441000	800750	Tucson	M-824-9-514	18+07	L

DIA = Diameter

TW = Top Width

D = Depth

L = Left

R = Right

4.0 DISCHARGE CHARACTERIZATION

The purpose of this section of the application is to provide data that describes the character of the municipality's storm water discharges. The data requirements include existing precipitation data, existing water quality data, field screening data for illicit discharges, and a storm water characterization plan.

The characterization plan is required of the municipalities to describe a program for monitoring major outfalls whose drainage areas are representative, in terms of land use, of the municipality. The representative water quality data can then be applied to the entire municipality to estimate annual pollutant loadings and mean concentration of pollutants that are discharged to the receiving waters.

In ADOT's case, a characterization plan is not required for the simple reason that ADOT is not a municipality. ADOT's roadways represent one type of land use within a municipality which will be accounted for with the municipality's characterization plan.

ADOT's consultant has discussed the requirements for a characterization plan with EPA personnel at the Region 9 office. The EPA stated that there is no need for ADOT to have a representative storm water sampling program, since the municipalities where ADOT's roadways are located will all be developing characterization plans.

The City of Phoenix, the City of Tucson, and other municipalities within their metropolitan areas are currently developing characterization plans which will propose sampling storm water from representative land use areas. Since runoff from roadways will be included in those representative sampling locations and ADOT's only contribution is runoff from roadways, the objective to collect information for estimating annual pollutant loadings will be met without the need for ADOT to set up a monitoring program.

All of the municipalities in Arizona are pursuing individual applications and therefore each will be required to provide between 5 and 10 monitoring stations. That will result in a considerable amount of data in which to characterize storm water discharges. In the Phoenix Area alone, the Cities of Phoenix, Tempe, and Mesa are all proposing characterization plans which will involve between 15 and 30 monitoring sites. The Cities of Scottsdale and Glendale and Maricopa County will also be preparing characterization plans in the future which will add another 15 to 30 storm water monitoring stations.

4.1 Existing Precipitation and Water Quality Data

4.1.1 Precipitation Data

Precipitation data is included in each individual municipality's NPDES Part 1 application.

4.1.2 Storm Sewer Discharge Water Quality Data

In 1988, ADOT contracted with Malcolm Pirnie, Inc. to prepare an environmental assessment on the storm water collected in the East and West tunnels (Major Outfall No. 10-145.17 and 10.149.18). The tunnels were constructed with sags in their profiles upstream of where they discharge to the Salt River. Consequently, they remain full of water between storms. Twice each year ADOT pumps the water out into the Salt River in order to inspect the tunnels. The environmental assessment was performed to assess the impact to the Salt River.

The following is an excerpt from the environmental assessment and also provided is Table 1 from Malcolm Pirnie's report which summarizes the water quality testing.

"Water Quality Results - Results from the three storm water samples are presented in Attachment 3 and are summarized in Table 1. Only those parameters detected in the ADOT storm water samples are shown in Table 1. The values for these parameters have been compared to a range of reported values obtained from previous storm water quality monitoring programs conducted in Phoenix and various cities throughout the United States. Based on this comparison, the storm water

quality in the tunnels appears to be that of typical storm water. Also shown in Table 1, for comparison purposes only, are the Safe Water Drinking Act (SWDA) Maximum Contaminant Levels (MCLs) only for those parameters detected in the ADOT storm water. These MCLs are presented because they may serve as guidelines or standards by ADEQ in the review of an NOD and issuing of an Aquifer Protection Permit. As can be seen, the values of the detected parameters are below the established MCLs except for total dissolved solids which is slightly higher than the secondary MCL and total coliform which is significantly higher than the MCL. Based on the above assessment, it does not appear that discharge of the tunnel storm water to the Salt River will have any adverse environmental impacts under today's regulations."

TABLE 1

SUMMARY OF STORM WATER QUALITY ANALYSIS

Reprinted From
Environmental Assessment on the Stormwater in the ADOT East and West Tunnels
 Malcom Pirnie, Inc.
 March 27, 1989

<u>Parameter</u>	<u>East Tunnel</u> 5/12/88 (mg/L)	<u>West Tunnel</u> 5/12/88 (mg/L)	<u>West Tunnel</u> 6/16/88 (mg/L)	<u>Typical</u> <u>Stormwater</u> <u>Levels</u> (mg/L)	<u>Safe Water</u> <u>Drinking Act</u> <u>Level</u> (mg/L)
General Chemistry ⁽¹⁾					
Bicarbonate	130	112	182.7	58-327 ⁽¹⁾	-
Total Alkalinity	130	112	182.7		-
Chloride	100	55.2	177	8-1132 ⁽¹⁾	250 (SMCL)
Nitrate as Nitrogen	2.3	2.2	0.5	1-17 ⁽¹⁾	10 (MCL)
pH	7.9	8.1	-	6.5-7.8 ⁽¹⁾	6.5-8.5 (SMCL)
Ortho Phosphate	0.10	0.18	0.49		-
Total Dissolved Solids	512	240	562	90-2350 ⁽¹⁾	500 (SMCL)
Total Organic Carbon	5.3	6.0	6.3		-
Total Phosphate	0.12	0.18	0.5		-
Total Suspended Solids	1.0	3.0	398	147-1223 ⁽²⁾	-
Total Sulfide	ND	1.0	ND		250 (SMCL) for Sulfate
Metals					
Cadmium	0.003	0.003	NA	.0001-.014 ⁽³⁾	.01 (MCL)
Zinc	0.017	0.205	NA	.01-2.4 ⁽³⁾	5 (SMCL)
Pesticides (EPA Method No. 608)	ND	ND	NA	-	-
VOCs (EPA Method No. 624)	ND	ND	NA	-	-
Semi-VOCs (EPA Method No. 625)	ND	ND	NA	-	-
Biological Oxygen Demand (5 day)	5	5	9	7-56 ⁽²⁾	-
Chemical Oxygen Demand	24	27	76	48-170 ⁽²⁾	-
Total Coliform ⁽⁴⁾	>1600	>1600	>1600	-	(1/100 mL (MCL)
Fecal Coliform ⁽⁴⁾	300	1600	>1600	230-40,000 ⁽²⁾	-
Dissolved Oxygen	1.3	1.1	NA	-	-

TABLE 1 (cont'd)

Reprinted From
Environmental Assessment on the Stormwater in the ADOT East and West Tunnels
Malcom Pirnie, Inc.
March 27, 1989

Notes:

ND = None Detected

NA = Not Analyzed

MCL = Maximum Contaminant Level

SMCL = Secondary Maximum Contaminant Level

1. Kenneth D. Schmidt and Associates, Results of the Initial Groundwater Quality Monitoring Phase (November 1979 - January 1981), Maricopa Association of Governments, Phoenix, Arizona, May, 1981.
2. Metcalf and Eddy, Inc., Urban Stormwater Management and Technology Update and Users' Guide, U.S. Department of Commerce, Municipal Environmental Research Laboratory, Cincinnati, Ohio, September, 1977.
3. U.S. Environmental Protection Agency, NURP Priority Pollutant Monitoring Program Volume 1: Findings, September, 1982.
4. Reported as Most Probable Number/100 ml.

4.1.3 Receiving Waters

The following is a list of waters which receive storm water discharges from ADOT's storm drainage system. Refer to the individual Part 1 Applications for the Cities of Phoenix and Tucson for a compilation of existing water quality information on the receiving waters. Their applications summarize the local water quality data from the Section 305(b) Report and the Non Point Source Assessment prepared by the Arizona Department of Environmental Quality.

Phoenix Area

1. Agua Fria River
2. Salt River
3. Tempe Drain (a.k.a., 48th Street Drain)
4. Arizona Canal Diversion Channel
5. Dreamy Draw Wash
6. New River
7. Skunk Creek
8. Scatter Wash
9. Old Cross Cut Canal
10. East Maricopa Floodway
11. Sossaman Channel

Tucson Area

1. Julian Wash
2. Santa Cruz River
3. Rodeo Wash
4. Bronx Wash
5. Rillito River
6. Railroad Wash
7. Arroyo Chico

4.2 Field Screening Analysis

A field screening analysis was conducted for all of ADOT's major outfalls in both the Phoenix and Tucson Metropolitan Areas. The results are presented herein.

According to the EPA guidance manual, the purpose of the field screen analysis is to "provide a preliminary determination about the existence, extent, and location of illicit connections and illegal dumping."

Illicit discharges are those flows that are not composed entirely of storm water. Therefore, flows that occur during dry weather are illicit discharges, unless they are metered flows from a storm water detention basin.

In ADOT's case, since the only land use involved is roadways, the potential for dry weather flows is fairly small and would come chiefly

from malfunctioning landscape irrigation or accidental spills on the highway. ADOT currently has management programs in place that work to eliminate both of these types of illicit discharges (refer to Section 5).

The other major potential sources of illicit discharges in ADOT's storm drainage facilities come from 1) inflow from the storm sewer systems of the adjacent municipalities, 2) irrigation tailwater from adjacent agricultural fields, and 3) unpermitted connections.

With respect to discharges from adjacent Cities, it is ADOT's understanding that the municipalities which are required to submit a permit application will undertake management programs to detect and eliminate illicit discharges; thereby, eliminating the illicit discharges to ADOT's storm water collection system.

In the case of agricultural irrigation, there are several areas where irrigation tailwater enters ADOT storm water collection channels. This occurs in the less developed, more rural, areas of the Phoenix Metropolitan Area. It is ADOT's understanding that the agricultural industry is exempt from these regulations and therefore, the irrigation tailwater is an illicit discharge that does not have to be addressed with a management program.

The third potential source of illicit discharges, unpermitted connections, are identified during routine inspections by ADOT district personnel. Refer to Section 5.1.3 and Section 5.2.3 for a description of inspections for unpermitted connections.

4.2.1 Location of Field Screening Points

All of ADOT's major outfalls in both the Phoenix and Tucson Metropolitan Areas were field screened for dry weather flows. There are a total of 35 major outfalls in the Phoenix Area and 14 in the Tucson Area. Refer to Section 3 of this application for a description of each major outfall.

4.2.2 Field Screening Procedures

ADOT personnel and their consultants were given a field screening training seminar by representatives of the Flood Control District of Maricopa County (FCDMC). The FCDMC provided the attendees with a sample field screening report form, instructions in making field observations and instructions in using colormetric test kits. The FCDMC also provided everyone with a manual prepared by them entitled "Procedures for Field Screening Storm Drain Outfalls" dated June, 1991.

Each location was visited in dry weather (i.e., at least 96 hours after any precipitation). The following site report form was filled out for each major outfall. If flow was observed, the outfall was revisited within 24 hours, but not less than 4 hours, after the first visit. The form requires information on location, receiving water, dimensions of outfall, vegetative growth, date and time of visit, observed flow, sedimentation, floatables, odor, and biological observations. In addition, a photograph was taken at each outfall. If flow was observed, the water was tested for total chlorine, total copper, total phenol, detergents, and pH. The flow was also observed for turbidity, color, oil sheen, and surface scum.

SITE REPORT
 DRY WEATHER FIELD SCREEN

Structure Name: _____

Outfall Location Code: _____ L.U. Type: _____
 (see manual, pp. FCD-1-5) (see reverse)

Receiving Water _____
 (water of the U.S., USGS map waters, or ADEQ designated waters)

Access Instructions: _____
 (nearest intersection or landmark)

For discrepancies or omissions only:
 Outfall type, shape, material, and dimensions (see manual for codes): _____

Vegetative Growth (circle one): none normal excessive growth inhibited growth
 (If no flow but excessive or inhibited growth, schedule additional site visit).

1st Visit
 Date/Time _____
 Precipitation <96 Hrs? Y / N
 Flow? Y / N

2nd Visit (>4 hrs and <24 hrs later)
 Date/Time _____
 Precipitation <96 Hrs? Y / N
 Flow? Y / N

pH: _____ su Color: # _____
 Cl₂: _____ ppm Ammonia: _____ ppm
 Cu: _____ ppm Oil Sheen Y / N
 Phenols: _____ ppm Surface Scum Y / N
 Deterg: _____ ppm Air Temp: _____ °F
 Turbidity _____ NTU Water Temp: _____ °F

pH: _____ su Color: # _____
 Cl₂: _____ ppm Ammonia: _____ ppm
 Cu: _____ ppm Oil Sheen Y / N
 Phenols: _____ ppm Surface Scum Y / N
 Deterg: _____ ppm Air Temp: _____ °F
 Turbidity _____ NTU Water Temp: _____ °F

Attach copy of Chain of Custody Record
 (see manual for example form)

Attach copy of Chain of Custody Record
 (see manual for example form)

Physical Observations (1st Visit):
 (circle appropriate descriptors,
 for "other" write in description)

Deposits: none sediments oily other
 Odor: none musty sewage rotten eggs
 solvent chlorine other

Physical Observations (2nd Visit):
 (circle appropriate descriptors,
 for "other" write in description)

Deposits: none sediments oily other
 Odor: none musty sewage rotten eggs
 solvent chlorine other

Biological: none fish algae other

Biological: none fish algae other

Signature: _____

Signature: _____

1st Visit (cont.)	2nd Visit (>4 Hrs. and <48 Hrs., cont.)
-------------------	---

Use one of the following:

A. Free Fall into container:
Volume _____ (gal) Time _____ (sec)

B. Channel/pipe Flow (provide sketch):
Depth _____ (in) Width _____ (in)
Velocity _____ (ft/sec)

Discharge Estimate _____ gpm

Use one of the following:

A. Free Fall into container:
Volume _____ (gal) Time _____ (sec)

B. Channel/pipe Flow (provide sketch):
Depth _____ (in) Width _____ (in)
Velocity _____ (ft/sec)

Discharge Estimate _____ gpm

Photograph of Outfall (record roll number and exposure number)

Additional Notes (sketch, flow data, observations, specify visit, 1st or 2nd):

Land Use (L.U.) Type: Indicate dominant watershed land use as residential, industrial, commercial, agricultural, mixed, unknown

4.2.3 Testing Equipment

Observed flows were tested for total chlorine, total copper, total phenol, detergents and pH using Chemetrics Storm Water Discharges Test Kit M-1000.

4.2.4 Results of Field Screening (Phoenix Metropolitan Area)

The following table summarizes the results of the field screening in the Phoenix Area. Photographs of each major outfall are included in Appendix D.

As can be seen from the summary, dry weather flows were recorded at four of ADOT's outfalls. All four of these locations were known to have dry weather flows. They include the Papago Channel discharge into the Agua Fria River, the East and West Tunnel discharges into the Salt River, and the Loop 101 Channel into New River. The flows in the East and West Tunnels originate within the City of Phoenix. The flow in the Papago Channel is primarily a combination of discharges from the City of Phoenix's storm sewer system and irrigation tailwater from adjacent agricultural fields. The flow in the Loop 101 Channel is also a combination of municipal discharges from the Cities of Glendale and Peoria and irrigation tailwater.

The channel along the north side of State Route 360 (Superstition Freeway) also experiences dry weather flows. Those flows currently discharge into a City of Mesa open channel that parallels the Tempe Canal and eventually drain to a City of Mesa detention basin at Price Road and the Western Canal. When the Price Road Tunnel is completed, the flows in the Superstition Freeway open channel will discharge through the tunnel and into the Salt River.

SUMMARY OF FIELD SCREENING DATA (Phoenix Metropolitan Area)

Outfall Identifier (Route-Mile Post)	Location	First Site Visit										Second Site Visit									
		Date	Time	Flow	Rate	pH	C12	Cu	PN	DT	Date	Time	Flow	Rate	pH	C12	Cu	PN	DT		
10-130.30 (Papago Channel)	1/2 Mile W. of E1 Mirage Rd. & 100' N. of I-10.	10/01/91	11:30 AM	Y	9.5 cfs	8.4	0.6 PPM	0	0	0.5 PPM	10/01/91	3:45 PM	Y	11.3 cfs	9.2	0.4 PPM	0	0	0.25 PPM		
10-145.17 (West Tunnel)	Central Ave. - W. side @ N. bank of Salt River.	09/30/91	10:30 AM	Y	1.1 cfs	7.6	0.4 PPM	0	0	0.5 PPM	09/30/91	3:30 PM	Y	1.5 cfs	7.4	0.3 PPM	0.1 PPM	0	0.5 PPM		
10-149.18 (East Tunnel)	20th St. - E. side @ N. bank of Salt River.	10/01/91	10:15 AM	Y	0.7 cfs	9.6	0.7 PPM	0.1 PPM	0	0.5 PPM	10/01/91	2:15 PM	Y	0.6 cfs	10.3	0.6 PPM	0.1 PPM	0	1.0 PPM		
10-150.44	N. Bank of Salt River & W. side of I-10.	09/30/91	1:30 PM	N																	
10-150.45	N. Bank of Salt River & E. side of I-10.	09/30/91	12:20 PM	N																	
10-151.06	N. Quadrant of I-10 & University Traffic Interchange.	09/27/91	8:40 AM	N																	
17-198.48	2200' S. of Buckeye Rd. & 1700' E. of 27th Ave.	10/15/91	9:00 AM	N																	
51-5.45	300' N. & W. of Intersection of 18th St. & Ocotillo.	10/02/91	11:00 AM	N																	
51-7.04	400' S. & E. of Intersection of Northern Ave. & Squaw Peak Highway.	10/08/91	10:15 AM	N																	
101-7.76	1/4 Mile S. of Northern Ave. & 1000' W. of 99th Ave.	10/08/91	10:15 AM	N																	
101-10.84	1/2 Mile N. of Peoria Ave. along E. Bank of New River.	10/08/91	10:55 AM	Y	0.5 cfs	9.5	0.6 PPM	0	0	0	10/09/91	9:20 AM	Y	0.5 cfs	9.2	.25 PPM	0.1 PPM	0	0.15 PPM		
101-11.85	1/2 Mile S. of Thunderbird Rd. & 300' W.	10/08/91	11:55 AM	N																	

C12 = Chlorine Cu = Copper PN = Phenol DT = Detergents cfs = Cubic Feet Per Second
 ppm = Parts Per Million

SUMMARY OF FIELD SCREENING DATA (Phoenix Metropolitan Area)																			
Outfall Identifier (Route-Mile Post)	Location	First Site Visit									Second Site Visit								
		Date	Time	Flow	Rate	pH	C12	Cu	PN	DT	Date	Time	Flow	Rate	pH	C12	Cu	PN	DT
101-13.44	200' S. of S.B. Bridge over Skunk Creek & 250' ± W.	10/08/91	12:20 PM	N															
101-13.68	30' N. of N.B. Bridge over Skunk Creek & 80' E.	10/08/91	12:30 PM	N															
101-14.38	1200' S. of Bell Rd. Traffic Interchange & 300' W.	10/08/91	12:50 PM	N															
101-15.18	4/10 Mile N. of Bell Rd. @ 500' W.	10/08/91	1:00 PM	N															
101-16.31	4/10 Mile S. of Beardsley Rd. & 300' W.	10/08/91	1:40 PM	N															
101-16.62	2/10 Mile S. of Beardsley Rd. & 500' W.	10/08/91	1:50 PM	N															
101-16.74	150' S. of Beardsley Rd. & 2800' W. of 75th Ave.	10/08/91	2:00 PM	N															
101-20.19	1/2 Mile S. of Beardsley Rd. @ 51st Ave.	10/08/91	2:30 PM	N															
101-21.236	245' E. of 43rd Ave. & N. Side of Beardsley Rd.	10/08/91	2:45 PM	N															
101-21.239	260' E. of 43rd Ave. & N. Side of N. Frontage Rd.	10/08/91	2:50 PM	N															
101-21.83	2000' W. of 35th Ave. & S. Side of S. Frontage Rd.	10/08/91	3:00 PM	N															
101-21.869	1600' S. of 35th Ave. & N. Side of N. Frontage Rd.	10/08/91	3:05 PM	N															

C12 = Chlorine Cu = Copper PN = Phenol DT = Detergents cfs = Cubic Feet Per Second
 ppm = Parts Per Million

SUMMARY OF FIELD SCREENING DATA (Phoenix Metropolitan Area)

Outfall Identifier (Route-Mile Post)	Location	First Site Visit									Second Site Visit								
		Date	Time	Flow	Rate	pH	C12	Cu	PN	DT	Date	Time	Flow	Rate	pH	C12	Cu	PN	DT
101-21.873	1500' W. of 35th Ave. & N. Side of N. Frontage Rd.	10/08/91	3:10 PM	N															
101-51.58 (Price Rd. Tunnel)	1 Mile N. of University Dr. & 200' E.	10/09/91	11:15 AM	N															
143-2.90	600' N. of Van Buren St. & 350' E. of S.R. 143 in Relocated Old Cross Cut Canal.	09/27/91	9:25 AM	N															
143-3.33	350' N. of Loop 202 @ W. Bank of Relocated Old Cross Cut Canal.	09/27/91	9:33 AM	N															
202-3.57	N.E. Quadrant of S.R. 143 & Loop 202 Traffic Interchange @ bank of Relocated Old Cross Cut Canal.	09/27/91	9:25 AM	N															
202-5.14	1800' S. of Washington St. & 2500' W. of 56th St.	09/27/91	8:37 AM	N															
202-5.90	1000' E. of Priest Dr. & 2200' N. of 1st St.	09/27/91	8:21 AM	N															
202-7.44	1100' W. of Rural Rd. @ N. Bank of Salt River.	09/27/91	8:06 AM	N															
202-7.98	1100' E. of Rural Rd. @ N. Bank of Salt River.	09/27/91	7:52 AM	N															
360-15.42	1/2 Mile E. of Higley Rd. & S.R. 360 Traffic Interchange on N. Side of S.R. 360.	09/27/91	7:50 AM	N															
360-17.63	1/4 Mile E. of Sossaman Rd. & S.R. 360 Traffic Interchange.	09/27/91	7:40 AM	N															

C12 = Chlorine

Cu = Copper

PN = Phenol

DT = Detergents

cfs = Cubic Feet Per Second

ppm = Parts Per Million

4.2.5 Results of Field Screening (Tucson Metropolitan Area)

The following table summarizes the results of the field screening in the Tucson Area. Photographs of each major outfall are included in Appendix E.

There were no dry weather flows at ADOT's major outfalls in the Tucson Area. This was not surprising in light of the fact that, for the most part, the City of Tucson and Pima County do not typically experience dry weather flows in their storm drainage system.

SUMMARY OF FIELD SCREENING DATA (Tucson Metropolitan Area)																			
Outfall Identifier (Route - Mile Post)	Location	First Site Visit									Second Site Visit								
		Date	Time	Flow	Rate	pH	C12	Cu	PN	DT	Date	Time	Flow	Rate	pH	C12	Cu	PN	DT
10-260.7	N. side of Julian Wash at 10th Ave. S. of I-10	09/17/91	3:30 PM	N															
10-261.5	1400' W. of S. Park Ave. & 1300' N. of Ajo Way - E. of SPRR	09/17/91	4:30 PM	N															
10-264.6	1200' S. of I-10 & Palo Verde Rd. Traffic Interchange - W. side Palo Verde Rd. & N. bank of Julian Wash	09/18/91	11:15 AM	N															
19-59.0	1200' S. of I-19 & Valencia Rd. Traffic Interchange - S. of Valencia Rd. & E. bank of Santa Cruz River	09/18/91	3:15 PM	N															
19-61.7	900' S. of I-19 & Ajo Way Traffic Interchange - E. side of I-19 & S. bank of Rodeo Wash	09/17/91	4:00 PM	N															
86-171.1	1600' S. of I-19 & Ajo Way Traffic Interchange - W. bank of Santa Cruz River & S. of Ajo Way	09/17/91	2:45 PM	N															
89-68.2	W. of Oracle Rd. between Adams St. & Lee St.	09/20/91	11:45 AM	N															
89-71.8	S. bank of Rillito River E. of Oracle Rd.	09/17/91	10:30 AM	N															
89-78.7	S.E. Quadrant of U.S. 89 & Greenrock Dr.	10/14/91	10:20 AM	N															
89-78.9	N.E. Quadrant of U.S. 89 & Greenrock Dr.	10/14/91	11:20 AM	N															
89-79.9	S.E. Quadrant of U.S. 89 & Hanley Rd.	10/14/91	11:10 AM	N															

C12 = Chlorine Cu = Copper PN = Phenol DT = Detergents cfs = Cubic Feet Per Second
 ppm = Parts Per Million

SUMMARY OF FIELD SCREENING DATA (Tucson Metropolitan Area)																			
Outfall Identifier (Route - Mile Post)	Location	First Site Visit										Second Site Visit							
		Date	Time	Flow	Rate	pH	C12	Cu	PN	DT	Date	Time	Flow	Rate	pH	C12	Cu	PN	DT
89-80.8	N.W. Quadrant of U.S. 89 and Canada Del Oro.	10/14/91	11:00 AM	N															
210-1.2	S.E. of Intersection of 10th St. & 3rd Ave.	09/16/91	4:45 PM	N															
210-2.7	N.W. quadrant @ intersection of Campbell Ave. & Aviation Pkw.	09/16/91	4:30 PM	N															

C12 = Chlorine

Cu = Copper

PN = Phenol

DT = Detergents

cfs = Cubic Feet Per Second

ppm = Parts Per Million

5.0 MANAGEMENT PROGRAMS

ADOT understands the importance of reducing storm water pollution. As a result, ADOT carries out a number of maintenance programs to help control the amount of pollutants in storm water. In addition, ADOT along with several other agencies, is very responsive to accidental spills of hazardous materials.

The following paragraphs describe the existing maintenance programs that ADOT has in place. These programs are carried out by the ADOT District One office in the Phoenix Area and the ADOT District Two office in the Tucson Area.

Maintenance programs for the Phoenix and Tucson Areas are discussed separately since they are tailored to meet each individual District's needs. For example, ADOT's storm sewer system in the Phoenix Area is quite extensive and includes pipes, open channels, pump stations and detention basins, whereas, the storm drainage system in the Tucson Area is primarily cross-drainage (refer to Section 3). Also the volume of traffic in the Phoenix Area is much greater which results in a more frequent street sweeping and litter pick-up program.

The ADOT District offices plan their maintenance activities on an annual basis. They follow a maintenance program called PeCoS II which requires the maintenance supervisors to schedule and budget their regular annual maintenance activities at the beginning of each year.

5.1 Phoenix Metropolitan Area (ADOT District One)

5.1.1 Street Sweeping and Litter Pick-Up

Street Sweeping

Highways are swept once per week. This is done on a contract basis with several local street sweeping companies.

Mechanized Litter Pick-Up

Litter, debris, dead animals and other discarded materials are picked up off the roadway surface daily. This is done with a special truck that picks the litter and debris up off the roadway surface without the need for maintenance crews to walk into the highway traffic.

Manual Litter Pick-Up

Litter pickup is also done by ADOT personnel and contract labor on a weekly basis. The work includes cleaning up all types of litter and debris left at the roadway edge and within the right of way.

In the event that containers or other materials which appear to be hazardous are found during litter pickup, the crews are instructed to leave them in place so that they can be tested. If found to be hazardous, the wastes are properly disposed of. ADOT has a contract with a hazardous materials handler to test and dispose of such materials.

Adopt-A-Highway Program

The ADOT Adopt-A-Highway Program helps reduce litter on Arizona Highways by encouraging volunteers to clean up litter and by heightening public awareness of the need to keep the Highways clean.

The program allows organizations to adopt designated sections of highway for which they are responsible to pick up litter at least three times per year. ADOT erects signs which call the motorists attention to the litter control program. The signs also credit the adoptive organization for its effort in keeping the highway clean.

5.1.2 Storm Sewer System Maintenance

Pump Station Maintenance

All pump stations within ADOT's drainage system are inspected three times per year. If necessary, the wet wells are cleaned of sediment and debris. If, during the inspection, water is found in the wet well that appears to be polluted (evidenced by odor, color, etc.) a sample is taken for immediate laboratory testing. If found to be polluted, the water is pumped out and properly disposed of. ADOT also endeavors to determine the source of the pollution to prevent future occurrences.

Tunnel Maintenance

ADOT owns and operates three large drainage tunnels (18' to 21' diameter) in the Phoenix Area. The profiles of the tunnels have sag points upstream from their outlet structures into the Salt River. The water in the tunnels is pumped out twice each year and the tunnel inspected and cleaned of debris and sediment.

Once each year water in the tunnels is laboratory tested to determine levels of pollutants. The results of past water quality testing are included in Section 4 of this application.

Storm Sewer Maintenance

Large diameter storm sewers (those large enough to walk through) are inspected at least once each year. Required cleaning and maintenance is performed as found necessary from the inspection.

Storm Sewer Inlet/Catch Basin Maintenance

Inlets and catch basins on ADOT's drainage system are inspected and cleaned once each year.

Open Channel Maintenance

Open channels within ADOT's drainage system are inspected and cleaned on a continuous basis. Maintenance crews observe the condition of the open channels on at least a weekly basis and they are cleaned of debris, vegetative growth, and sediment as required.

5.1.3 Control of Illicit Discharges

Permit System

Storm sewers which connect and drain into ADOT's drainage system are controlled by one of two means. If the connection is made during construction of the ADOT storm sewer, there is normally an Intergovernmental Agreement formed between ADOT and the city/agency which is discharging to ADOT's facility. If the connection is made subsequent to construction, the discharger is required to obtain a permit pursuant to Rule 17-3-712 (refer to Section 2 of this application). In any case, the discharger is always required to either enter into an intergovernmental agreement with ADOT or obtain a permit from ADOT.

Inspection

ADOT District One, which operates and maintains ADOT highways in the Phoenix Metropolitan Area, has two full time employees which inspect for unpermitted activities within the ADOT's right of way. Their efforts include the identification of all types of illegal encroachments including construction work, dumping, and illicit discharges.

Pump Station Gas Detection

ADOT storm sewer pump stations are constructed with gas detection systems which sends an alarm signal to the District One office in the event that combustible substances are detected in the wet well. The alarm is monitored on a 24-hour basis. If the alarm is sounded, ADOT ALERT team members can respond in 15 - 20 minutes to shut off the pump if necessary.

5.1.4 Emergency Response Program for Accidental Spills

The State of Arizona has a plan in place to respond to accidental spills of hazardous materials. The plan is called the State of Arizona Hazardous Materials Response and Recovery Plan. It defines authority and responsibility for individual State agencies in response to accidental spills. It also establishes an emergency management framework for joint state agency operations. ADOT signed a memorandum of understanding along with other State agencies, committees, and commissions, that indicated their concurrence with the plan. Since then ADOT has been actively carrying out its responsibilities under the plan.

ADOT District One has created its own response team called ALERT (an acronym for ADOT Local Emergency Response Team) that responds to all types of emergencies on ADOT's roadways including spills of hazardous material. The ALERT members are on call 24 hours a day,

7 days a week. Their duty in the event of a hazardous material spill is to contain the spill, take care of traffic problems, and manage the cleanup of the spill.

ADOT District One has prepared an ALERT Manual which designates individual responsibilities and lists key emergency personnel within ADOT and within the local communities. Two employees of District One are on call 24 hours a day, 7 days a week to respond to emergencies. In addition, the Safety and Health Section of ADOT has a statewide emergency response specialists who also responds.

In the event of an accidental spill, the Arizona Department of Public Safety (Highway Patrol) contacts the ADOT on-call ALERT members directly. The Arizona Department of Public Safety, the Arizona Department of Environmental Quality and the Arizona Department of Transportation all respond to the accidental spill. ADOT's responsibilities include:

1. Coordinate with local fire and police departments.
2. Contain spill by blocking storm drains, building dikes, etc.
3. Take care of traffic problems.

4. Manage the cleanup of the hazardous materials.

In most cases, the individual or company that is guilty of the spill is held responsible for contracting with a waste management company to clean it up. However, in the event that the guilty party either can not be identified or does not have the necessary resources; ADOT has risk management funds in place to have the spill properly cleaned up.

5.1.5 Erosion Control Practices

Construction Activities

ADOT's 1990 Standard Specifications for Road and Bridge Construction requires the contractor to provide temporary and permanent erosion control.

Erosion Control Maintenance

ADOT District One has an ongoing maintenance program to provide permanent erosion control in areas of erodible soils. These maintenance programs include soil stabilization, reseeding bare ground, turf renovation, landscape irrigation maintenance, granite erosion control, and landscaping.

Roadside Vegetation Management Program

ADOT has a statewide roadside vegetation management program to control annual weeds that tend to choke out more desirable perennial grasses. The annual weeds provide little if any erosion control since they do not have extensive root systems and since they die out and blow away each year. On the other hand, grasses and other perennial species have extensive root systems that hold the soil in place.

The vegetation management activities include chemical spraying, mowing, blading, reseeding/planting, fertilizing, and brush removal. In the case of chemical spraying, ADOT commissioned a study to determine environmentally acceptable methods of applying herbicides. The following is an excerpt from the Arizona Department of Transportation Roadside Vegetation Management Program:

*Summary
of the
Environmental Requirements and Mitigation Measures*

1. *Qualified specialist supervisory personnel will be available to each district. Program supervisory personnel will possess the appropriate Arizona Agricultural Pesticide Control Advisor License.*

2. *It is ADOT procedure that applicators will possess the appropriate Restricted Use Applicators license. Chemical applicators will be trained in the safe storage, mixing, application, container disposal and recordation of chemicals used.*
3. *Well maintained spray equipment will be used in the application of chemicals.*
4. *Only E.P.A. labeled and registered herbicides will be used.*
5. *No E.P.A. listed prohibited or restricted chemicals will be used.*
6. *Review of research and testing will occur on a continual basis, adjustments to the proposed chemical list will reflect continuing public and environmental concerns.*
7. *Testing of the chemicals requiring further evaluation (Figure 2) will follow established guidelines.*
8. *Substituting an above tested chemical into the scenario applications will occur only after concurrence of the Roadside Review Committee, and preparation of updated environmental assessment.*

9. *All recommended label directions for rates of application and species treated will be strictly followed.*
10. *Drift control agents will be used with all herbicides as appropriate.*
11. *Spraying will not be attempted in adverse weather conditions. Applications will stop when wind velocities negatively affect accurate application.*
12. *All chemical treatments will be recorded in a daily spray log, and records will be kept.*
13. *The phenoxy herbicides will not be used in proximity of susceptible agricultural crops during the crop season in strict compliance to the herbicide label.*
14. *Threatened or Endangered federally listed proposed or candidate plant species known locations will be designated restricted management areas.*
15. *Special consideration will be given to areas where an encroachment potential by livestock can be anticipated.*
16. *ADOT will obtain all necessary permits from agencies who retain ownership of the right of way.*

Irrigation System Pressure Detection

Through the use of telemetry, ADOT's landscape irrigation system is continuously monitored for water pressure and flow. Any malfunctions or leaks in the irrigation system will be detected by the pressure sensors which in turn will be automatically sent to a computer terminal at the District One offices.

The main purpose of this system is for water conservation. The system provides immediate detection of broken sprinklers and water pipes and consequently repair crews can respond very quickly.

A side benefit of this system is control of erosion. Since ADOT repair crews can respond almost immediately to water system failures, there is less chance of soil erosion as a result of broken water pipes.

5.2 Tucson Metropolitan Area (ADOT District Two)

5.2.1 Street Sweeping and Litter Pick-Up

Street Sweeping

Highways are swept once per month by District Two except for U.S. Route 89 and State Route 86. The City of Tucson, through an intergovernmental agreement with ADOT, is responsible for surface

maintenance on U.S. 89 and S.R. 86 within the Tucson City limits. ADOT sweeps the portions of U.S. 89 and S.R. 86, that fall outside of the City, four times per year.

Mechanized Litter Pick-Up

Litter, debris, dead animals and other discarded materials are picked up off the roadway surface daily. This is done with a special truck that picks the litter and debris up off the highway without the need for maintenance crews to walk into the highway traffic.

Manual Litter Pick-Up

Litter pickup is also done by ADOT personnel and contract labor on a monthly basis. The work includes cleaning up all types of litter and debris left at the roadway edge and within the right of way.

In the event that containers or other materials which appear to be hazardous are found during litter pickup, the crews are instructed to leave them in place so that they can be tested. If found to be hazardous, the waste are properly disposed of. ADOT has a contract with a hazardous materials handler to test and dispose of such materials.

Adopt-A-Highway Program

The ADOT Adopt-A-Highway Program helps reduce litter on Arizona Highways by encouraging volunteers to clean up litter and by heightening public awareness of the need to keep the Highways clean.

The program allows organizations to adopt designated sections of highway for which they are responsible to pick up litter at least three times per year. ADOT erects signs which call the motorists attention to the litter control program. The signs also credit the adoptive organization for its effort in keeping the highway clean.

5.2.2 Storm Sewer System Maintenance

Pump Station Maintenance

ADOT does not have any pump stations in the Tucson Area.

Tunnel Maintenance

ADOT does not have any tunnels in the Tucson Area.

Storm Sewer Maintenance

Storm sewers are inspected after large flows occur or at least once every two years. Required cleaning and maintenance is performed as found necessary from the inspection.

Storm Sewer Inlet/Catch Basin Maintenance

Inlets and catch basins on ADOT's drainage system are inspected and cleaned after large flows or at least once every two years.

Open Channel Maintenance

Open channels within ADOT's drainage system are inspected and cleaned on a continuous basis. Maintenance crews observe the condition of the open channels on at least a weekly basis and they are cleaned of debris, vegetative growth, and sediment as required.

Culvert Maintenance

Cross drainage culverts under ADOT highways undergo a formal inspection once every two years. They are also inspected after large flows.

5.2.3 Control of Illicit Discharges

Permit System

The system of permitting storm sewer connections is the same as District One follows in the Phoenix Area (Refer to Section 5.1.3).

Inspection

ADOT District Two, which operates and maintains ADOT highways in the Tucson Metropolitan Area, has three maintenance supervisors which work in the Tucson Area. Each supervisor has a crew of 12 to 13 people. During their normal inspection and maintenance routine they inspect for unpermitted uses within ADOT's right of way which includes the identification of all types of illegal encroachments including construction work, dumping, and illicit discharges.

Pump Station Gas Detection

ADOT does not have any pump stations in the Tucson Area.

5.2.4 Emergency Response Program for Accidental Spills

The emergency response program described in Section 5.1.4 also applies to the Tucson Area.

ADOT District Two has three separate maintenance groups that respond to all types of emergencies on ADOT's roadways including spills of hazardous material. Each maintenance group has three people who are available to the Department of Public Safety (Highway Patrol) 24-hours a day, 7 days a week. As is the case in the Phoenix Area, their duty in the event of a hazardous material spill is to contain the spill, take care of traffic problems, and

manage the cleanup of the spill. In addition, the Safety and Health Section of ADOT has a statewide emergency response specialists who also responds.

5.2.5 Erosion Control Practices

Construction Activities

ADOT's 1990 Standard Specifications for Road and Bridge Construction requires the contractor to provide temporary and permanent erosion control.

Erosion Control Maintenance

ADOT District Two has an ongoing maintenance program to provide permanent erosion control in areas of erodible soils. These maintenance programs include soil stabilization, reseeding bare ground, landscape irrigation maintenance, granite erosion control, and landscaping.

Roadside Vegetation Management Program

The roadside vegetation management program described in Section 5.1.5 also applies to the Tucson Area.

5.3 Cost of Management Programs

The following maintenance costs are based on an annual period and represent budgeted funds for 1991.

Phoenix Metropolitan Area (ADOT District One)

Litter Pick-Up	\$ 404,000
Street Sweeping	432,000
Inspection/Cleaning of Pump Stations	192,000
Tunnel Cleaning and Inspection	45,000
Storm Drain and Catch Basin Cleaning and Inspection	134,000
Maintenance of Open Channels	135,000
Response to Hazardous Spills	25,000
Landscape and Erosion Control Maintenance (Includes Litter Pick-Up in the Landscaped Areas)	2,302,000
Total	\$3,669,000

Tucson Metropolitan Area (ADOT District Two)

Litter Pick-Up	\$ 72,000
Street Sweeping	85,000
Storm Drain Inspection and Cleaning	14,000
Catch Basin Cleaning	6,000
Maintenance of Open Channels	2,000
Response to Hazardous Spills	10,000
Erosion Control Maintenance	<u>21,000</u>
Total	\$ 210,000

6.0 FISCAL RESOURCES

The Arizona Department of Transportation does not have a separate fund strictly for its storm water programs.

If storm water issues or concerns are construction related, it is included in the department's 5-year highway construction program and is approved by the State Transportation Board.

If storm water issues or concerns are maintenance related, they are covered under a lump sum from the Highway Maintenance Fund.

A copy of the Department of Transportation approved appropriation and general funds for fiscal year 1992 is attached.

Also included in the following information are graphical illustrations of 1) Fund Sources and Uses: Highway Program, 2) 1991-92 ADOT Highway Financial Plan and a copy of the Highway Five-Year Construction Program Funding for fiscal year 1992-1996.

In addition, Section 5.0 (Management Programs) includes a summary of budgeted funds for existing maintenance programs which reduce the amount of pollutants in the storm water runoff from ADOT's highways.

DEPARTMENT OF TRANSPORTATION - SUMMARY

A.R.S. § 28-101

Charles E. Cowan, Acting Director

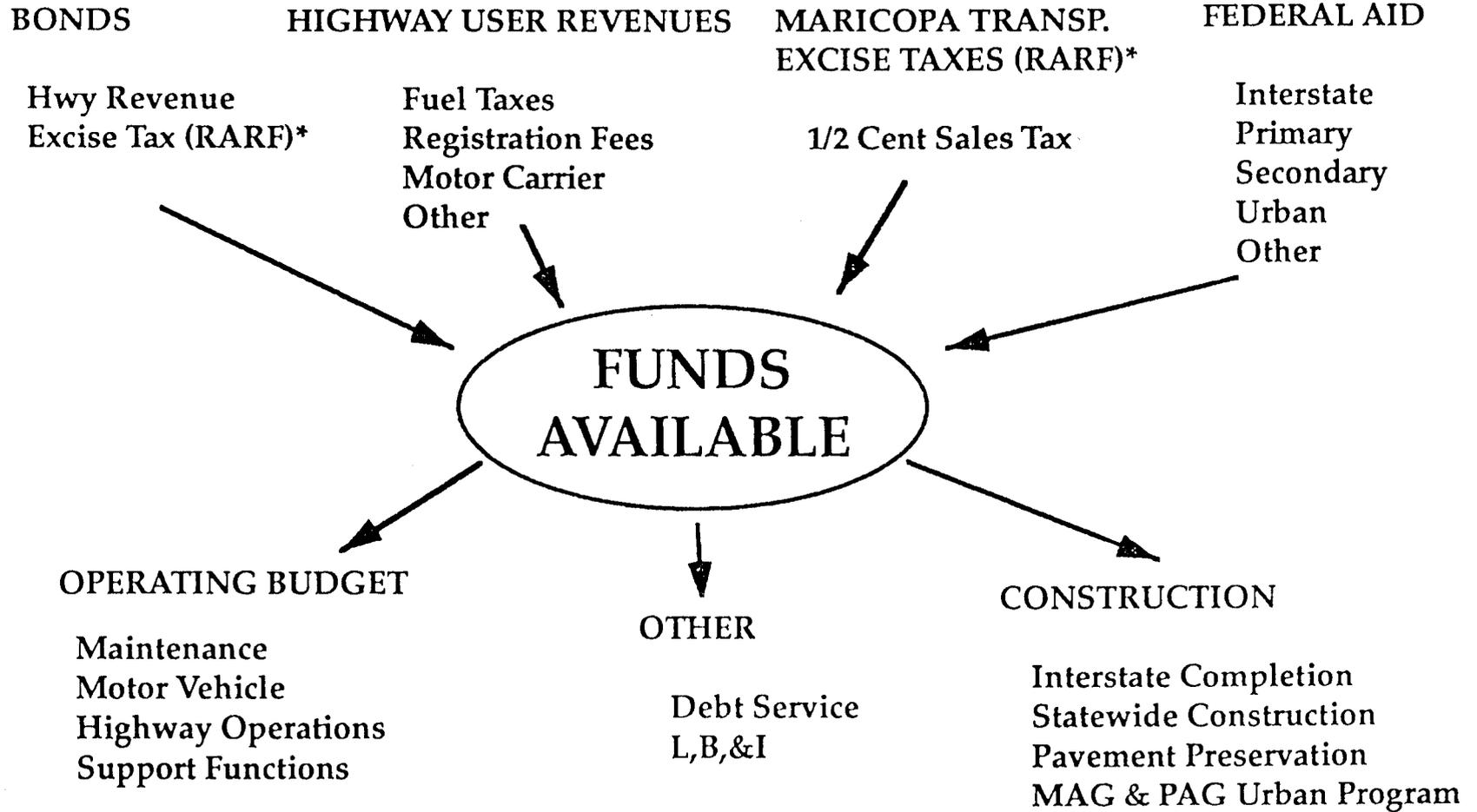
JLBC Analyst: Blanton

GENERAL FUND AND OTHER APPROPRIATED FUNDS	FY 1990 Actual	FY 1991 Estimate	FY 1992 Approved
<u>Program Summary</u>			
Director's Staff	405,200	447,700	460,600
Transportation Planning Division	3,401,300	3,816,200	4,347,300
Administrative Services Division	30,961,800	32,938,900	34,109,100
Special Support Group	3,337,300	3,886,900	3,915,200
Motor Vehicle Division	29,498,500	31,964,300	32,446,500
Highways Division	100,857,800	109,285,800	111,824,300
Aeronautics Division	1,113,600	1,683,100	1,780,800
Public Transit Division	76,800	107,700	100,200
TOTAL APPROPRIATIONS	169,652,300	184,130,600	188,984,000
<u>Expenditure Detail</u>			
FTE Positions ^{1/}	3,328.5	3,334.0	3,295.3
Personal Services	61,515,200	64,725,800	63,948,200
Employee Related Exp.	12,063,900	15,450,100	16,348,600
Prof. & Outside Services	2,465,900	1,517,400	1,778,000
Travel - State	1,287,500	1,792,300	1,697,800
Travel - Out of State	138,700	159,300	143,200
Other Operating Exp.	20,814,100	24,894,700	25,030,100
Equipment	2,073,200	913,600	1,495,100
All Other Operating Exp.	26,779,400	29,277,300	30,144,200
OPERATING SUBTOTAL	100,358,500	109,453,200	110,441,000
Special Line Items ^{2/}	69,293,800	74,677,400	78,526,400
Additional Appropriations ^{2/}	--	--	16,600
TOTAL APPROPRIATIONS	169,652,300	184,130,600	188,984,000
<u>Fund Summary</u>			
State Highway Fund	168,395,200	182,308,800	185,601,100
State Aviation Fund	1,113,600	1,683,100	1,780,800
General Fund	76,800	76,200	67,300
Air Quality Fund	66,700	62,500	63,100
Highway User Revenue Fund	-0-	-0-	1,372,900
Abandoned Vehicle Administration Fund	-0-	-0-	98,800
TOTAL APPROPRIATIONS	169,652,300	184,130,600	188,984,000

^{1/} Includes the following FTE positions funded in Special Line Items. 839.5 in FY 1990, 850 in FY 1991, and 896 in FY 1992.

^{2/} Details for the Special Line Items and Additional Appropriations are included on the individual program pages.

FUNDS SOURCES & USES: HIGHWAY PROGRAM

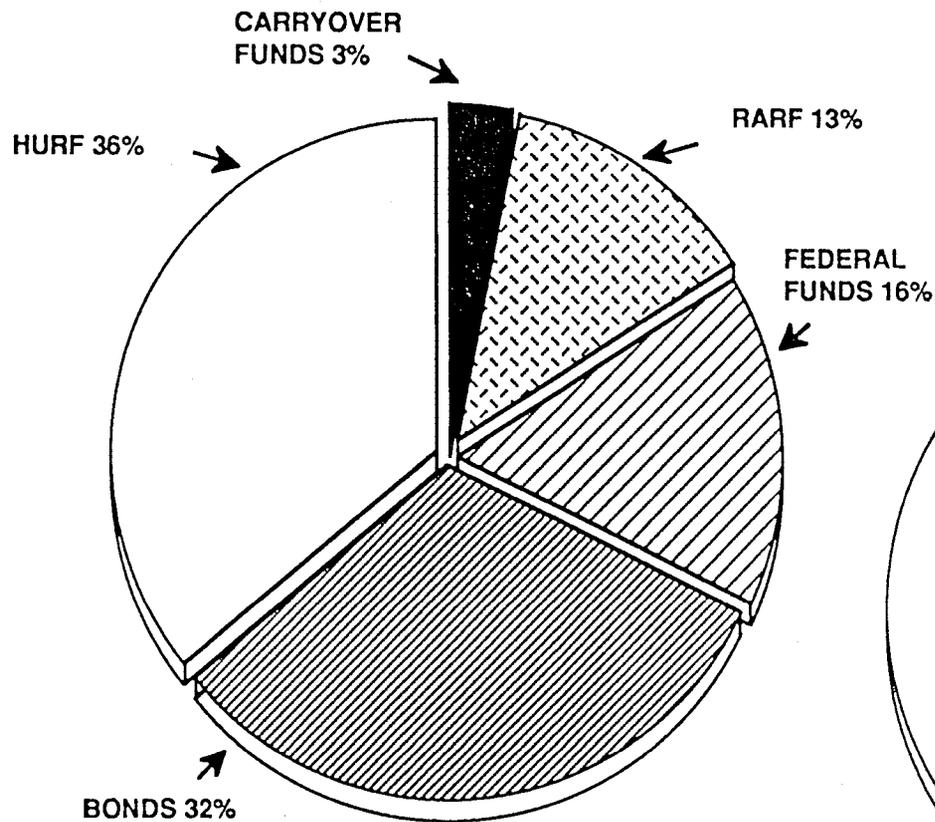


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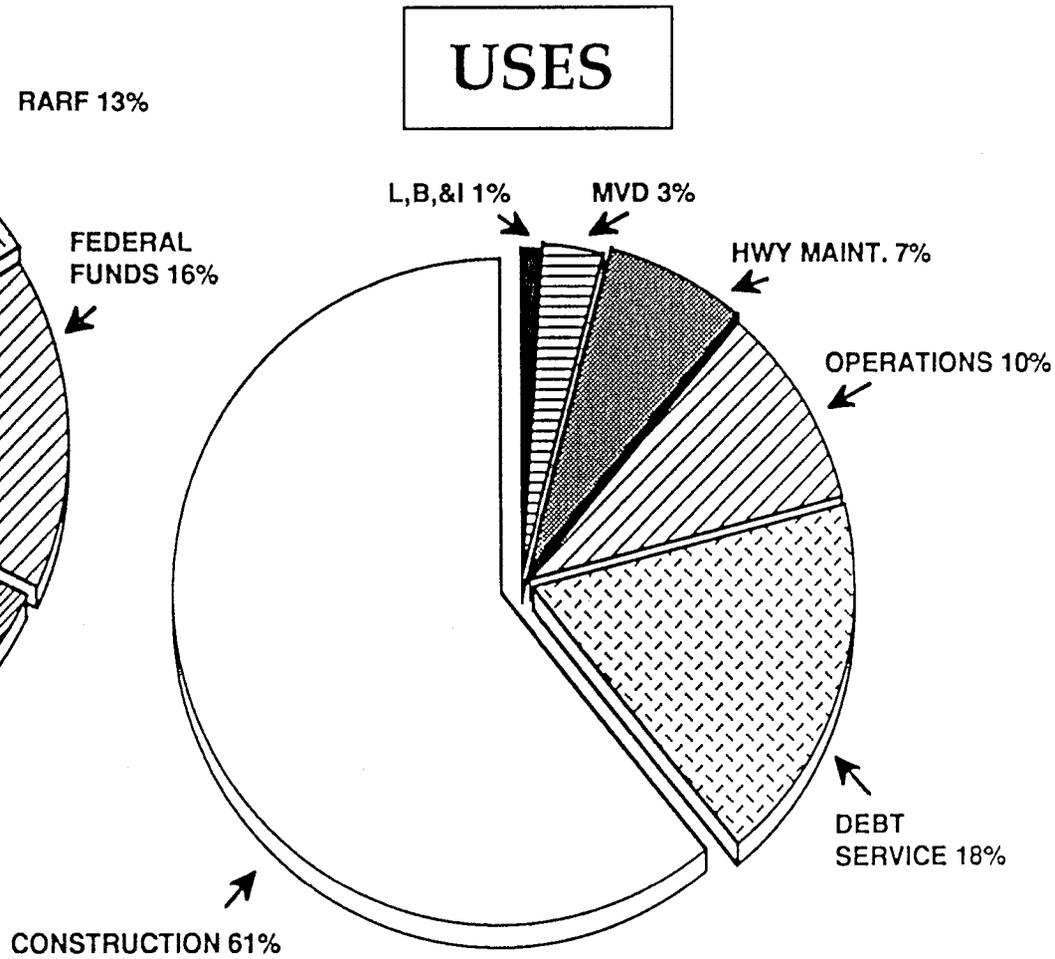
* Regional Area Road Fund

1991-92 ADOT HIGHWAY FINANCIAL PLAN

TOTAL PROGRAM: \$925.2 M



SOURCES



USES

HIGHWAY FIVE-YEAR CONSTRUCTION PROGRAM

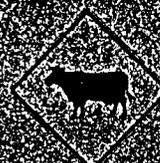
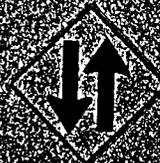
FY 1992 - FY 1996

(Thousands)

<u>PROGRAM CATEGORIES</u>	<u>FY 92</u>	<u>FY 93</u>	<u>FY 94</u>	<u>FY 95</u>	<u>FY 96</u>	<u>TOTAL</u>
Interstate	\$1,500	\$0	\$0	\$0	\$0	\$1,500
Interstate 4R	71,485	76,290	84,450	56,500	39,300	328,025
67 System Maintenance *	87,330	72,290	72,570	68,000	68,000	368,190
Non-Interstate	149,480	105,920	106,560	90,330	85,205	537,495
Urban Controlled Access	200,855	121,570	41,720	163,240	177,290	704,675
Other	54,205	37,955	36,895	41,145	38,890	209,090
	<u>\$564,855</u>	<u>\$414,025</u>	<u>\$342,195</u>	<u>\$419,215</u>	<u>\$408,685</u>	<u>\$2,148,975</u>

* This includes Interstate 4R preservation work.

**Arizona Revised
Statutes and Rules**



Title 28

TRANSPORTATION LAWS OF ARIZONA

Published by
ARIZONA DEPARTMENT OF TRANSPORTATION
Administrative Services Division
Procedures and Publications

Extracted from
ARIZONA REVISED STATUTES
Updated 1988

Charles E. Miller
Director
AZ Department of Transportation

Suzanne H. Salt
Assistant Director
Admin. Services Division

50. "State airports" means state-owned airports.
51. "State engineer" means the assistant director of the highway division of the department of transportation.
52. "State highway" means any state route or portion of a state route, that is accepted and designated by the transportation board as a state highway and maintained by the state.
53. "State route" means any right-of-way, whether actually used as a highway or not, designated by the transportation board as a location for the construction of a state highway.
54. "Street" or "highway" means the entire width between the boundary lines of every way when any part thereof is open to the use of the public for purposes of vehicular travel.
55. "Superintendent" means the assistant director for the motor vehicle division of the department of transportation.
56. "Trailer" means a vehicle with or without motive power, other than a pole trailer, designed for carrying persons or property and for being drawn by a motor vehicle and so constructed that no part of its weight rests upon the towing vehicle. A semitrailer equipped with an auxiliary front axle commonly known as a dolly shall be deemed to be a trailer.
57. "Truck" means any motor vehicle designed or used primarily for the carrying of property other than the effects of the driver or passengers and includes a motor vehicle to which has been added a box, a platform or other equipment for such carrying.
58. "Truck tractor" means any motor vehicle designed and used primarily for drawing other vehicles and not constructed to carry a load other than a part of the weight of the vehicle and load drawn.
59. "Vehicle" means a device in, upon or by which any person or property is or may be transported or drawn upon a public highway, excepting devices moved by human power or used exclusively upon stationary rails or tracks.
60. "Vehicle transporter" means either:
- (a) A truck tractor that is capable of carrying a load and drawing a semitrailer.
 - (b) A truck tractor with a stinger-steered fifth wheel capable of carrying a load and drawing a semitrailer or a truck tractor with a dolly mounted fifth wheel which is securely fastened to the truck tractor at two or more points and capable of carrying a load and drawing a semitrailer.

28-102. Motor vehicle registration; resident; definition

A. Except as provided by subsection B of this section, "resident", for the purpose of registration and operation of motor vehicles, means the following:

1. Any person who, regardless of domicile, remains in this state for an aggregate period of six months or more during any calendar year.
2. Any person who engages in a trade, profession or occupation in this state or who accepts employment in other than seasonal agricultural work.
3. Any person placing children in a public school without payment of nonresident tuition.
4. Any person who declares himself to be a resident of this state

for the purpose of obtaining at resident rates a state license or tuition fees at an educational institution maintained by public funds.

5. Any individual, partnership, company, firm, corporation or association which maintains a main office, branch office or warehouse facilities in this state, and which bases and operates motor vehicles in this state.

6. Any individual, partnership, company, firm, corporation or association which operates motor vehicles in intrastate transportation, for other than seasonal agricultural work.

B. The term "resident" does not mean:

1. A nonresident owner of a foreign vehicle registered and licensed in a state adjoining this state, which is used in this state for other than the transportation of passengers or property for compensation, if the nonresident owner and vehicle are domiciled in an adjoining state but within twenty-five miles of the border of this state, and if the state in which the owner has his residence and in which the vehicle is registered exempts from payment of registration and weight fees like vehicles from this state, regardless of whether the nonresident owner engages in a trade, profession or occupation in this state or accepts employment in other than seasonal agricultural work. A nonresident owner may apply for exemption from payment of the registration and weight fees in the manner prescribed by section 28-501, subsections E and G.

2. An out-of-state student enrolled with seven or more semester hours, regardless of whether the student engages in a trade, profession or occupation in this state or accepts employment in this state.

3. A nonresident daily commuter as defined by section 28-361.

C. The nonresident owner of a foreign vehicle registered and licensed in a state adjoining this state, if the foreign vehicle is exempt from partial or total payment of lieu taxes, and partial or total payment of registration fees by virtue of an agreement entered into with an adjoining state under authority of section 28-202, subsection C, may apply for exemption from payment of partial or total lieu taxes, registration and payment of partial or total fees in the manner prescribed by section 28-501, subsections F and G.

D. For the purposes of this section "out-of-state student" means a person who is enrolled at an educational institution maintained by public monies and is not classified as an in-state student under section 15-1802 or is a student at a private educational institution and would not be classified as an in-state student under section 15-1802 if the student were attending a public educational institution.

28-103. Department of transportation

A. There is established a department of transportation which shall provide for an integrated and balanced state transportation system.

B. The administration of the department is the responsibility of the director.

C. The transportation board shall have the policy powers and duties prescribed in section 28-106 and shall be advisory to the director on other matters as required.

28-104. Department jurisdiction; organization

A. The exclusive control and jurisdiction over state highways, state routes, state airports and all state owned transportation systems or modes is vested in the department of transportation.

B. The department shall:

1. Register motor vehicles and aircraft, license drivers, collect revenues, enforce motor vehicle and aviation statutes, and perform related functions.

2. Do multi-modal state transportation planning, cooperate and coordinate transportation planning with local governments, and establish an annually updated priority program of capital improvements for all transportation modes.

3. Design and construct transportation facilities in accordance with a priority plan; and maintain and operate state highways, state airports, and state public transportation systems.

4. Investigate new transportation systems and cooperate with and advise local governments concerning the development and operation of public transit systems.

5. Have administrative jurisdiction of transportation safety programs and implement them in accordance with applicable law.

C. In order to carry out the responsibilities enumerated in subsection B, the department shall be organized into the following divisions:

1. Motor vehicle.
2. Transportation planning.
3. Highways.
4. Aeronautics.
5. Public transit.
6. Administrative services.

28-104.01. Transportation districts

The state is divided into six transportation districts as follows:

1. First district, Maricopa county.
2. Second district, Pima county.
3. Third district, Cochise, Greenlee and Santa Cruz counties.
4. Fourth district, Gila, Graham and Pinal counties.
5. Fifth district, Apache, Coconino and Navajo counties.
6. Sixth district, La Paz, Mohave, Yavapai and Yuma counties.

28-105. Transportation board; members; appointments; terms; compensation

A. There shall be a transportation board in the department of transportation.

B. The transportation board shall consist of seven members, one from each of the six transportation districts and one from the state at large. At least two members of the board shall have experience in aviation.

C. The governor shall appoint members of the transportation board for terms of six years pursuant to section 38-211 to expire on the third Monday in January of the appropriate year.

D. A person shall not be qualified to be a member of the transportation board representing a transportation district who has not

been a resident and taxpayer of the state and county from which he is chosen for at least five years immediately prior to his appointment.

E. A member shall not be appointed to serve two terms in succession. If a transportation district includes more than one county, the governor shall rotate the appointment of members for the district between each county in the district.

F. If a member who represents a transportation district changes his residence to another county his office shall become vacant.

G. Each member shall receive compensation as determined pursuant to section 38-611.

H. The transportation board may meet, when necessary, at any place within the state. The transportation board shall meet for the purpose of organizing on the third Monday in January of each year at which time they shall designate the district member with the shortest period of time remaining to serve a complete term as chairman who shall preside at all sessions. The board shall designate the district member with the next shortest period of time remaining to serve a complete term as vice-chairman who shall preside in the absence of the chairman. If the district member with the least time to serve does not choose to serve as chairman, then the members shall select a chairman from the remaining board members.

I. If the chairman's membership on the transportation board is terminated for any reason, the remaining members of the transportation board shall select another member to serve as chairman until the regular organizational meeting on the third Monday in January of each year.

J. The transportation board shall hold other regular meetings as it may determine. Special meetings may be called by the chairman, with the concurrence of not less than two members.

28-106. Powers and duties of the board; definition

A. With respect to aeronautics, the transportation board shall distribute monies appropriated to the division from the state aviation fund for planning, design, development, acquisition of interests in land, construction and improvement of publicly owned and operated airport facilities in counties and incorporated cities and towns. The transportation board shall distribute the monies according to the needs for such facilities as determined by the board.

B. With respect to highways, the transportation board shall:

1. Establish a complete system of state highway routes.
2. Determine which state highway routes or portions of such routes shall be accepted into the state highway system, and which state highway routes shall be improved.
3. Establish, open, relocate, alter, vacate or abandon any portion of a state route or state highway.

C. The transportation board shall establish policies and the relative weights given to criteria to guide the development or modification of the five-year transportation facilities construction program, award all construction contracts for transportation facilities and monitor the status of such construction projects.

D. The transportation board shall determine priority program planning with respect to transportation facilities.

E. With respect to transportation facilities other than highways, the transportation board shall establish, open, relocate, alter, vacate or abandon all or portions of such facilities.

F. For purposes of subsection A, a "publicly owned and operated airport facility" means an airport and appurtenant facilities in which one or more agencies, departments or instrumentalities of this state or any city, town or county of this state holds an interest in the land upon which the airport is located which is clear of any reversionary interest, lien, easement, lease or other encumbrance which might preclude or interfere with the possession, use or control of the land for public airport purposes for a minimum period of twenty years.

G. The transportation board shall prescribe rules and regulations for the effective administration of its powers, duties and responsibilities including rules and regulations relating to:

1. Priority programs.
2. Establishing, altering or vacating highways.
3. Construction contracts.
4. Revenue bonds.
5. Local government airport grants.
6. Designating or establishing scenic or historic highways.
7. Prohibiting bid rigging.

28-106.01. Construction of new airports; approval by board; criteria; definitions

A. No new airport shall be constructed within the boundaries of any urbanized area or within twenty-four statute miles of the exterior boundary of any urbanized area without approval of the transportation board. This section does not apply to heliports or to additions to any existing airport.

B. The board shall approve construction of a new airport only if:

1. The construction of such new airport is consistent with the state, regional and local aviation system plans; and
2. The state, regional and local aviation plans have considered relevant criteria including airspace and air safety, land use compatibility and priority of funding.

C. For the purposes of this section:

1. "Airport" means any area of land or water designed and set aside for the landing and taking off of aircraft and utilized or to be utilized for those purposes.
2. "Heliport" means an area of land, water or structure used or intended to be used for the landing and takeoff of rotorcraft.
3. "Rotorcraft" means a heavier-than-air aircraft that depends principally for its support in flight on the lift generated by one or more rotors.
4. "Urbanized area" means an urbanized area as defined in the decennial census by the United States bureau of the census.

28-107. Director; deputy director; appointment; compensation

A. The director shall be appointed by the governor pursuant to section 38-211 from a list of qualified candidates submitted by the

transportation board and shall serve at the pleasure of the governor.

B. The state personnel commission shall prepare a job description for the position of director and recruit candidates for the position. The transportation board shall receive and review applications for the position of director and shall forward the names of all qualified applicants to the governor. The governor may ask for additional names and recommendations at any time.

C. Compensation for the director shall be established pursuant to section 38-611.

D. There may be a deputy director of the department who shall be appointed by the director with the approval of the governor. The deputy director shall serve at the pleasure of the director. The deputy director will be directly responsible for the duties delegated to him by the director.

28-108. Powers and duties

A. The director shall:

1. Supervise and administer the overall activities of the department, its divisions and employees.
2. Appoint assistant directors for each of the divisions which assistant directors shall be exempt from the state personnel system.
3. Prescribe such rules and regulations as he deems necessary for the collection of taxes and license fees.
4. Provide for the assembly and distribution of information to the public concerning the department activities.
5. Prescribe such rules and regulations as he deems necessary for public safety and convenience.
6. Prescribe rules and regulations for the expenditure of all money in the state highway fund.
7. Prescribe standard board and road signs, or other devices, and provide a uniform system of marking and signaling on state routes and state highways, which shall correlate with and so far as possible conform to the system as approved by the American association of state highway officials, and regulate the use of advertising signboards and road signs on state roads or state highways.
8. Prescribe rules and regulations for closing state highways under construction or repair.
9. Receive, allocate, control and disperse all funds designated for state mass transit programs by federal or state law, regulation or rule.
10. Pass upon projects for construction in cooperation with the United States, and negotiate and enter into contracts on behalf of the state with the United States for the cooperative construction and maintenance of federal aid mass transit systems within the state.
11. Enter into agreements on behalf of the state with counties, cities, towns, mass transit districts, or with any other political subdivision for the improvement or maintenance of mass transit systems, or for the joint improvement or maintenance thereof, and enter into contracts for the construction of state mass transit systems.
12. Prescribe rules and regulations for the application for and the expenditure of all mass transit funds.
13. Exercise such other powers and duties as are necessary to fully

carry out the policies, activities and duties of the department.

14. Delegate such functions, duties or powers as he deems necessary to carry out the efficient operation of the department.

15. Contract for both the operation of state owned airports and for the purpose of securing air search and rescue services.

16. Plan, build and develop, in conjunction with local authorities, airports, airport terminals and other related navigational facilities.

17. Operate and maintain the Grand Canyon national park airport located in the Kaibab national forest, Coconino county.

18. Enter into agreements on behalf of the state with counties, cities, towns or rural districts for the improvement or maintenance of state routes, or for the joint improvement or maintenance thereof.

19. Exercise complete and exclusive operational control and jurisdiction over the use of state highways and routes and prescribe such rules and regulations regarding such use as he deems necessary to prevent the abuse and unauthorized use of such highways and routes.

20. Coordinate the design, right-of-way purchase and construction of controlled-access highways which are either state routes or state highways and related grade separations of controlled-access highways and the design, right-of-way purchase, construction, standard and reduced clearance grade separation, extension and widening of arterial streets and highways under chapter 9 of this title and assist counties and municipalities in the counties in the development of their regional transportation plans under chapter 9 of this title to ensure that the streets and highways within each county form a regional system.

21. On or before December 1 present an annual report to the speaker of the house of representatives and the president of the senate documenting the expenditures of monies under chapter 9 of this title during the previous fiscal year relating to the design, right-of-way purchase or construction of controlled-access highways which are accepted in the state highway system as state routes or state highways or related grade separations of controlled-access highways which are included in the regional transportation plans of the counties.

22. In the fifth and fifteenth year in which a transportation excise tax is in effect in a county as provided in title 42, chapter 8.3, article 1, review past expenditures and future planned expenditures and determine the impact of the expenditures in solving transportation problems within the county. The board of supervisors of a county which has approved a transportation excise tax as provided in title 42, chapter 8.3, article 1 shall review past expenditures and future planned expenditures of the monies on projects which are not in the state highway system and determine the impact of the expenditures in solving transportation problems within the county. The board of supervisors shall transmit the information to the director in the form and manner that the director determines.

23. In the tenth year in which a transportation excise tax is in effect in a county as provided in title 42, chapter 8.3, article 1, review projects completed to date and projects to be completed during the remaining years in which a transportation excise tax is in effect and within six months after the end of the tenth year present a report to the speaker of the house of representatives and the president of the senate detailing findings and making recommendations. The board of supervisors

of a county which has approved a transportation excise tax as provided in title 42, chapter 8.3, article 1 shall review projects completed to date which are not in the state highway system and projects to be completed during the remaining years in which the tax is in effect which are not in the state highway system. The board of supervisors shall transmit the information to the director in the form and manner that the director determines.

24. Enter into agreements by direct contract with nonpublic entities for services or jointly exercise any powers common to the contracting parties that he deems necessary and in the best interests of the department subject to the limitations of section 41-2544.

B. The director may provide technical transportation planning expertise to local governments when requested, coordinate local government transportation planning with regional and state transportation planning and guide local transportation planning to assure compliance with federal requirements. Such planning authority shall not, however, preempt planning responsibilities and decisions of local governments.

C. If the governor declares a state of emergency the director may, as necessary, contract and do all things necessary to provide emergency transportation services for the residents in the affected areas whether such emergency transportation is by streets, by rail or by air.

28-109. Legal counsel

The attorney general shall be the legal advisor of the department and shall give legal services as the department requires. Compensation for personnel assigned by the attorney general to perform such services shall be a charge against appropriations to the department. He shall prosecute and defend in the name of the state all actions necessary to carry out the provisions of this title.

28-110. Reproduction of records; notification of reproduction; admissibility of reproductions as originals; destruction of nonessential or obsolete records; computer storage of information

A. The director may cause any records kept by the department to be photographed, microphotographed, photostated or reproduced on film. The film or reproducing material shall be of durable material and the device used to reproduce the records on the film or material shall be such as to accurately reproduce and perpetuate the original records in all details.

B. When such photostatic copies, photographs, microphotographs or reproductions on films are placed in conveniently accessible files and provisions made for preserving, examining and using them, the director may certify such fact to the director of the department of library, archives and public records, who shall thereafter, within ninety days, direct the disposal, archival storage or destruction of the records or papers.

C. Such photostatic copy, photograph, microphotograph or photographic film of the original records shall be deemed to be an original record for all purposes, and shall be admissible in evidence in all courts or administrative agencies. A facsimile, exemplification or certified copy thereof shall, for all purposes recited in this section, be

6. Knowingly stores, services, repairs or otherwise works upon any vehicle wholly or partly within any highway other than upon a vehicle which is temporarily disabled.

7. Knowingly removes, damages or destroys any tree or shrub standing on a highway right-of-way.

8. Knowingly obstructs or injures any public highway, runway or taxiway by causing or permitting flow or seepage of water under his control to escape onto the highway, runway or taxiway.

B. Each day of violation of any provision of subsection A of this section is a separate violation upon failure to remove or to diligently prosecute the removal of any encroachment after notice under section 28-1871. Each encroachment shall be treated as a separate violation.

C. In addition to the penalties prescribed by this section, an act committed contrary to this section is a public nuisance and may be abated by injunction, and a person who commits any such act is subject to an action for damages by the state brought by the attorney general, or the county attorney of the county in which the act is committed upon direction of the attorney general.

D. The provisions of this section do not apply to any department personnel or agents performing normal construction and maintenance functions and do not apply to any person who has prior authorization in writing from the director to perform any of the acts referred to in this section.

28-1871. Additional remedies against particular highway or airport encroachments

A. If an encroachment is a fixed advertising device or a movable object, notice for the removal of the encroachment may be given to the occupant or owner of the reversionary interest of the land or person causing or owning the encroachment by personal service or by registered or certified mail at his place of residence if known, and if unknown notice may be posted upon the encroachment. If a highway encroachment, the notice shall specify the width of the highway, the place and extent of encroachment and require the removal of the encroachment within thirty days thereafter if the encroachment is a fixed advertising device and within fifteen days after notice is given or posted if the encroachment is a movable object. If an airport encroachment, the notice shall specify the location of the runway or taxiway, the place and extent of the encroachment and require the removal of the encroachment within thirty days thereafter if the encroachment is a movable object. If this procedure is used and if the removal is not commenced within the required period or after being commenced is not diligently prosecuted, the department or if not a state highway or airport facility, then the governing body of the appropriate political subdivision, may remove such encroachment without commencing any action. The person responsible for the encroachment shall bear the cost of removal, and an action may be filed in the superior court in and for the county where such encroachment is made or exists, and where such removal is manifested, to secure reimbursement of the necessary cost of removal to the subdivision of the

state in which the custody and control of the highway or airport facility is lodged by law.

B. The use of any procedure provided for in this section is not exclusive and shall not prohibit the use of any other remedy provided by law to protect any highway or airport facility or the authority of officers of the department of public safety to cause the immediate removal of obstructions, encroachments, vehicles or aircraft.

28-1872. Leaving gate open when road crosses fenced land; classification

A. A person traveling on a road or highway open for use and used by the public which passes into or over any part of an enclosed field or pasture of another person, and which has a gate or bars across the road or highway at the point of entrance to or exit from such enclosed field or pasture, shall securely close the gate or bars after opening them.

B. A person violating this section is guilty of a petty offense.

28-1873. Dumping refuse, rubbish or debris on highways or airports; classification

A. A person who dumps, deposits, places, throws or leaves refuse, rubbish, debris, filthy or odoriferous objects, substances or other trash upon a state or county highway, road, public thoroughfare, public airport or the right-of-way thereto or within twenty yards of a state or county highway, road, public thoroughfare or public airport is guilty of a class 3 misdemeanor.

B. If a class 3 misdemeanor is committed as set forth in subsection A from a motor vehicle or aircraft, the driver of the vehicle or pilot of the aircraft shall be presumed to be the offender.

C. The director, the board of supervisors of each county, and the governing body of each city or town shall cause signs to be erected at suitable intervals on highways, airports and public thoroughfares in their respective areas of authority, including public parks, informing the public that it is unlawful to perform the acts prohibited by subsection A.

D. The Arizona highway patrol, the sheriff's office of each county, and the peace officers of each city or town are charged with the duty of enforcing the provisions of this section.

28-1874. Publication of law relating to dumping refuse, rubbish or debris on highways

The director shall cause to be printed and distributed with each license plate and each original or renewal of a driver's or chauffeur's license material relating to the provisions of section 28-1873 as he deems advisable.

Effective 1/1/90

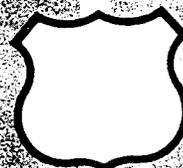
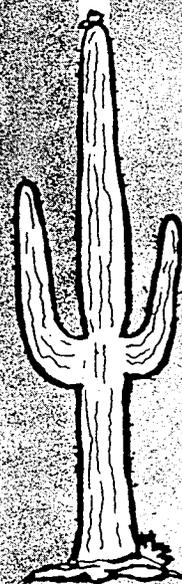
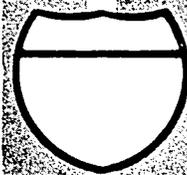
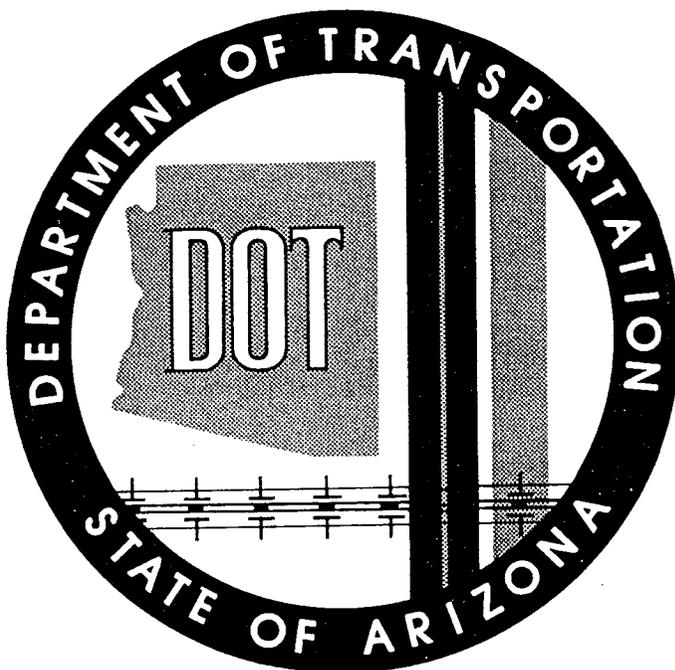
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ARIZONA

Encroachments in Highway Rights - of - Way

RULE NO. R17-3-712



HIGHWAYS DIVISION
MAINTENANCE PERMITS SERVICES
APRIL 14, 1981

CERTIFICATION OF RULES ADOPTED

ARIZONA DEPARTMENT OF TRANSPORTATION

(Name of Agency, Board, Commission, Department, Officer)

The undersigned hereby certifies that attached hereto is a true and correct copy of the Order of Rule Adoption dated January 6, 1981 which provides as follows:

ADOPTED Arizona Encroachments in Highway Rights-of-Way, Rules No. R17-3-712
A.C.R.R. Rule No.(s)

AMENDED R17-3-712
A.C.R.R. Rule No.(s)

REPEALED _____
A.C.R.R. Rule No.(s)

Dated this 6th day of January, 1981

ARIZONA DEPARTMENT OF TRANSPORTATION

(Name of Agency, Bd., Commission, Dept., Officer)

E.F. Sandlin

(Signature of Officer) E.F. SANDLIN

Deputy State Engineer

(Title of Officer)

(PLACE STAMP OR SEAL, IF ANY)

Certification, Attorney General's Office

APPROVED & CERTIFIED pursuant to
A.R.S. Section 17-3-01 of this
14th April 1981
Bob Corbin

Attorney General

NOTE: Three (3) copies of the rule changes shall be filed with an original and two (2) copies of this Certification form following certification by the Attorney General. The rule changes shall be typewritten, double spaced, on standard size paper, 8½" X 11".

ARIZONA DEPARTMENT OF TRANSPORTATION
ENCROACHMENTS IN HIGHWAY RIGHTS-OF-WAY

Rule No. R 17-3-712

This pamphlet presents information regarding Arizona State law concerning encroachments in highway rights-of-way. It also gives definitions, authority, responsibility, and exhibits for encroachment permit application procedures, traffic control and detours, city issued state permits, rest area coffee breaks, maintenance responsibility, unauthorized encroachments and other rules relative to the safe and efficient placement of utility lines within our highway rights-of-way.

PREPARED AND DISTRIBUTED BY:

Maintenance Permits Services
Maintenance Section, Highways Division
Arizona Department of Transportation

ENCROACHMENTS IN HIGHWAY RIGHTS-OF-WAY
 Rule No. R17-3-712
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ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAY DIVISION

HIGHWAY OPERATIONS GROUP

Order of Rule Adoption

Pursuant to A.R.S. 28-108, the Arizona Department of Transportation hereby adopts the following Rule:

A new Section R 17-3-712, Encroachments in Highway Rights-of-Way is adopted to read as follows:

A. Purpose and Authority

1. Purpose

In order to adequately control highway rights-of-way, prevent their abuse, and unauthorized use, the Director herein wishes to prescribe the above referenced rule.

2. Authority ARS 28-108(19)

"The Director shall: . . . 19. Exercise complete and exclusive operational control and jurisdiction over the use of state highways and routes and prescribe such rules and regulations regarding such use as he deems necessary to prevent the abuse and unauthorized use of such highways and routes."

B. Scope

The rules and regulations herein established include permit application procedures, permit processing procedures, initial placement, adjustment, relocation, reconstruction and replacement for use of State highway rights-of-way.

C. Encroachment Permit Application Procedures

1. Completed ADOT applications shall be sent to the appropriate District Engineer. (See list of District offices in Exhibit 1). The District Engineer is responsible within the District for all phases of implementing the control of encroachment permits from the initial application, review, approval, construction and final inspection.

2. Plans Required

Applicants shall submit a set of plans indicating highway route number, mileposts, highway engineering stations, and physical features such as building, bridges, culverts, poles and other

stationary landmarks necessary to adequately describe the location. Permit applicants are encouraged to employ competent design professionals such as registered professional engineers or architects when preparing plans of a complex nature. Permit applications shall include four sets of plans on primary and secondary highways and five sets on Interstate highways. Commonly used construction standards are included as Exhibit Numbers 2 -10.

3. Each Application Reviewed

All permit applications are initially submitted to respective districts. Only when necessary, will the districts route them to the appropriate department, for comments. The findings will be forwarded to the district office for final evaluation and issuance. A copy of the permit is sent to Maintenance Permits Services for filing as well as for quality control, i.e., review for uniformity and consistency in compliance with ADOT standards, specifications and special requirements in the issuance of permits. No work is to be performed until the permit is approved. All work is to be in accordance with Arizona Department of Transportation standards.

4. Time Limit

Ninety (90) calendar days will be the normal time allowed for completion of construction. Time limits beyond ninety days' time may be granted as determined by the Arizona Department of Transportation.

5. Time Extension

Applicants may apply for a time extension beyond the allotted time indicated on the permit by contacting the District office. If work has changed, a reapplication may be required.

6. Transfer of Permits

Permits are transferable upon sale of ownership provided new owner furnishes the Arizona Department of Transportation with a notification within 30 days after date of sale. It is the obligation of the permittee to notify the new owner of the necessity to apply for a change of ownership.

7. Bonding

- a. Performance bonds or other assurance of construction may be required to insure faithful performance of a permittee's

obligation. The amount shall be equal to one half the amount of the cost of the work or any other possible financial loss to the State (as determined by the District Engineer).

- b. The performance bonds shall be executed by the applicant as principal with a corporation duly authorized to transact surety business in the State of Arizona. The bond shall be in favor of the Arizona Department of Transportation, shall be continuous in form, and shall be limited to the face amount of the bond irrespective of the number of years the bond is in force. The bond shall be released upon satisfactory performance and acceptance of the work or may be cancelled after the applicant has provided other security satisfactory to the Arizona Department of Transportation which will cover obligations that remain.
- c. In instances where an applicant is issued numerous small permits throughout the year, he may post a continuing bond to cover work under more than one permit. The continuing bond shall be of a value sufficient to cover all work under construction by the permittee at any time and shall be satisfactory to the District Engineer.
- d. The bonding requirement may be waived when it can be determined by the District Engineer that adequate protection is provided the Department to ensure satisfactory completion of the construction.

8. Access

- a. No access will be granted where access control rights have been legally established unless waived by the State Engineer in accordance with FHWA standards.
- b. Access to abutting property from within Interstate or other freeway rights-of-way where permitted will be limited to:
 - i. Frontage roads except the merging entrance and exit ramp areas which will be subject to traffic engineering evaluation.
 - ii. Intersecting or nearby public roads and streets within Interstate rights-of-way. At interchanges control for connections to the crossroad is normally effected beyond the ramp terminals by purchasing

of access rights. Such control should extend along the crossroads beyond the ramp terminal 100 feet or more in urban areas and 300 feet or more in rural areas subject to traffic engineering evaluation.

- c. Access from within primary, secondary or other conventional highway rights-of-way will be permitted in accordance with appropriate standards. (See Exhibits 2, 3 and 8).
- d. Median openings may be allowed on divided highways except Interstate or other freeways provided they conform to Arizona Department of Transportation policy regarding the design and spacing of such openings. This policy will be provided applicants upon request.
- e. Permits shall be only for the construction of new turnouts and driveways or changing the location of an existing driveway. They shall not be issued for the purpose of providing a parking area or for servicing of vehicles on highway right-of-way.
- f. Joint driveways may become desirable for landowners of adjacent properties to require a joint driveway to service both properties. If this is the case, only one of the two adjacent landowners need apply for the access permit but a notarized written mutual agreement, signed by all parties involved, must accompany the application form.

9. Signs

On-premise signs, displays, canopy, awning, or devices may be erected on structures occupying highway right-of-way airspace, but shall be limited to those indicating ownership and type of on-premise activities and shall be constructed in accordance with Arizona Department of Transportation Standards (See Exhibit 10). No portion of the structure support is allowed within highway right-of-way.

10. Landscaping

- a. The highway roadside is an integral unit of a total highway facility. The term "roadside" generally refers to the area between the outer edge of the roadway and the right-of-way boundary. These include all unpaved areas within the right-of-way.
- b. All plans and specifications shall be sufficiently complete and detailed for easy

analysis, cost estimating and compliance inspection and shall be submitted in accordance with "Roadside Development Landscaping Permit Guidelines" available to applicants upon request.

- c. Permit applicants or their professional consultants may be required to discuss and coordinate landscape plans with the Roadside Development Services prior to permit approval.
- d. Plans shall be designed to select plant materials appropriate for the intended use and location, to arrange plants for optimum effect, and to insure reasonable maintenance within the capability of the proposed permittee. Permit application will be reviewed for consideration of the factors which can affect the safe and efficient operation of the highway facility. It will be the responsibility of the permit applicant to assure that all landscaping is maintained after construction.
- e. A clear line of sight must be maintained at all highway intersections and entrances; therefore, all plantings in this zone must be limited to an ultimate height of 30 inches or less.
- f. Plants shall not be used where they may encroach upon drainage-ways and impede their functional value or increase maintenance. It shall be the responsibility of the permit applicant to assure that all landscaping is maintained after construction.

11. Hydraulics

At the discretion of the District Engineer the following information shall be submitted by permit applicants when any changes are made in drainage conditions:

- a. A narrative report including a description of the existing drainage conditions, the proposed revisions and the effect of the proposed changes on existing conditions;
- b. Maps and/or drawings sufficient to show all pertinent features of the proposed modifications. This may include site maps, drainage area maps, contour maps, grading plans, structure profiles, channel profiles, etc;

- c. Hydrologic and hydraulic calculations when applicable for design discharge, headwater elevations, tailwater elevations, flow depths and flow velocities in channels.

12. Utilities

All use permits will be in accordance with the Arizona Department of Transportation Guide for Accommodating Utilities on Highway Rights-of-Way. If applicant has a utility agreement with Arizona Department of Transportation, this agreement shall be included with the application. Utility plans shall adequately show such features as pavement and right of way lines in relation to their proposed facilities. Plans shall clearly indicate any existing utilities in the area. (See Exhibit 9). If plan symbols are used that are not standard, they shall be defined on the plans submitted.

13. Fences, Gates and Cattleguards

Applicants shall be responsible for assuring that stock do not enter upon the highway modifying or installing fence, gates or cattleguards. Backfences shall be maintained in a stockproof condition. (See Exhibits 6 and 7).

14. Jack or Bore

Pipes, conduit or other utilities shall be jacked or bored through beneath paved area. Pits may be placed in the median for boring, jacking or driving of pipes or conduits under divided roadways. The pit areas shall be completely fenced or barricaded and placed at a minimum distance of thirty feet from the edge of shoulder. Pavement cuts shall be considered only when jacking, boring or other alternatives are proven impractical and then only when approved by the District Engineer. (See Exhibits 4 and 5).

D. Parades, Motion Pictures

Parade and Motion Picture requests shall be made in writing with an accompanying sketch and submitted directly to the appropriate District Engineer as listed in Exhibit 1. The request shall include:

1. Location
2. Purpose
3. Time - - date and hour
4. Length of time

5. Traffic control
6. Traffic re-route
7. A statement holding the Arizona Department of Transportation harmless in the event of any damage to persons or property which is caused by the event.

E. Temporary Signs or Banners, Including Christmas Decorations

No temporary signs, banners or Christmas decorations shall be attached to any traffic control device, nor shall any such signs, banners or decorations interfere with operation of such devices. Requests for temporary signs or banners shall be made in writing and submitted directly to the appropriate District Engineer as listed in Exhibit 1. The request shall include:

1. Location
2. Height of sign or banner across Highway (18' Minimum)
3. Size of sign or banner and wording
4. Inclusive dates sign or banner will hang
5. A statement holding the Arizona Department of Transportation harmless in the event of any damage to persons or property which is caused by this event.
6. Legend

F. Traffic Control and Detours

Traffic shall be protected at all times in accordance with the Arizona Department of Transportation Traffic Control Manual. All signs, placement of signs, barricades, lights, and necessity of flagmen shall be the responsibility of the Permittee.

G. Minimum Setback

1. 50 MPH or greater design speed:
 - a. Minimum setback of a fixed object from the edge of the traffic lane should be 30 feet unless one of the following reasons will allow for a lesser distance:
 - i. Cuts of 3 to 1 or steeper - obstacles are allowed 10 feet behind the point of vertical intersection (P.V.I) at the toe of the slope.

- ii. Where concrete barriers, walls, abutments, or other rigid obstructions are used - fixed objects may be placed 4' behind the obstructions.
 - iii. Where flexible guardrail (Box-Beam, W-Beam, or cable) is used 6 to 20 feet behind the face of the guardrail, depending upon the type.
 - iv. Where there are barrier curbs (5" or more vertical face) near a traveled lane - 6 feet behind the face of the curb; adjacent to a parking lane - no definite setback distance.
- b. Where limited right-of-way or the necessity for planting would result in less clearnace, all factors in the particular problem area should be weighed to decide if a special exception is warranted.
2. 50 MPH or Less Design Speed:
 - a. Minimum setback of a fixed object from the edge of the traffic lane may be 25 feet unless one of the reasons set forth under (1) will allow for a lesser distance.
 - b. On curves, adequate sight distance for the design speed of the highway must be maintained.

H. Rest Area Coffee Breaks

Free coffee is allowed in rest areas for which donations may be accepted but not required if the following conditions are met:

1. The activity must be conducted for the expressed purpose of improving the safety of highway travel and not as an advertisement of any organization or activity.
2. The applicant must be a nonprofit organization with a concern for automotive, highway or driver safety.
3. The activity must be carried on solely within the rest area apart from any ramp or other surface used for the movement of vehicles. The intent is to assure an absolutely safe operation. Permission will not be granted for such activity at rest areas where the activity could cause a backup along the ramps to the main lanes of the highway.

4. The activity must have the approval of the appropriate ADOT District Engineer and must meet other requirements of State law:
- a. Applicant shall specify the rest area to be utilized on interstate or primary highway including route number and milepost. If on a divided highway with dual rest areas, both shall be utilized. This is to promote highway safety by alleviating the need of vehicles to cross the median illegally.
 - b. Specific time and date that a "safety break" is to be in operation shall be stated by the applicant.
 - c. In order to provide the least rest area interruption, the District shall designate the location to be utilized for the coffee break facility.
 - d. Applicants must submit a sketch indicating the location, legend and size for any proposed signs. The District Engineer shall have authority over type, size up to the maximum as stated in Item 5 below, and location of signs on or off the right-of-way.
 - e. A letter for each request must state that the applicant agrees to abide by the following requirements:
 - i. The State accepts no liability for such activities.
 - ii. There shall be no impeding of traffic or normal use of the rest area.
 - iii. Erection and removal of all signs will be at no cost to the State.
 - iv. After the specified time for the activity has terminated, the applicant will be given 24 hours to remove all signs.
 - v. The maximum size of signs shall be limited to a rectangular 4' x 8' or one with an equivalent area.
 - vi. Any connection to rest area power shall be done in full compliance with OSHA safety requirements. The use of electrical cords outside the area of the facility will not be permitted.
 - vii. The connector to the rest area power source shall be so placed that it does not constitute a hazard to the public nor

be an inconvenience to them. Permittee shall use only the connector furnished by the State. If no power is available, the permittee shall provide his own.

- viii. Applicant shall be responsible for cleaning the site following use. Failure to do so will result in the district billing applicant for costs.
- ix. No tools other than those manufactured for use on water faucets shall be used to secure water from rest area facilities.
- x. Approval for requests will be made on a first come, first served basis; however, requests will not be accepted earlier than 45 days nor later than 7 days before the first date of proposed service. No formal permit will be issued; however, a letter of response will originate from the appropriate District Engineer with copies to the appropriate maintenance highway crew supervisor, DPS office and Maintenance Permit Engineer. The letter may also contain additional specific conditions for use of that particular rest area.

I. City-Issued State Permits

When authorized by maintenance agreements with Arizona Department of Transportation, cities may issue permits to use State highway RIGHT-OF-WAY. A city authorized to issue State highway permits is required to use State Standard Permit forms and follow such general State policies regarding encroachments as may be specified by Arizona Department of Transportation. State design standards may be modified in cases where city standards of design are more restrictive than State requirements, in which case City standards of design will be followed.

J. Maintenance Responsibility

The adjacent property owners having access to a State highway shall be fully responsible for the maintenance of their driveway including the portion from the highway right-of-way line to the outside edge of the highway shoulder or curblin. This maintenance responsibility includes the removal of snow and ice and keeping the portion within the highway right-of-way in a safe condition for the general public. The owner shall be responsible for the maintenance of ditches, pipes, catch basins, grates, poles, gates, aerial wires, buried cables and other structures or installations placed in connection with encroachment permits. The owner will be given ten days notice to

perform the required maintenance. After this period, the Director may then perform the required maintenance, and the owner shall be liable for the costs of such maintenance. If an emergency exists wherein there is an immediate hazard to the highway, the Director may perform the required remedial maintenance, and the owner shall be liable for all such costs incurred. The owner shall be responsible for any revisions or improvements required as a result of changed conditions of use after the permit is issued and/or after construction is completed, upon the direction of the Arizona Department of Transportation.

K. Unauthorized Encroachments

A.R.S. 28-1870 defines misuse of public highways or airports. Use of State highway rights-of-way shall be limited to authorized uses herein described. Any other uses will be permitted only by specific approval by the Director of Transportation. Owners of unauthorized property located in the State highway right-of-way will be notified that they are in violation of State law. If the encroachment has not been removed within the time prescribed, the Director may remove the unauthorized encroachment, and the owner shall be liable for the cost of such removal.

1. The following encroachments or uses of state highway right-of-way will normally not be permitted:
 - a. Advertising signs
 - b. Parking areas
 - c. Sales of any article, service or thing
 - d. Bicycle, walking, equestrian or other activities on Urban Freeways
 - e. Any commercial or industrial activity
2. None of the above uses of state highway right-of-way will be permitted except for applications in special circumstances, and the use in no way conflicts with safe and efficient highway uses nor with highway maintenance or other authorized activities. Permits will always need to be acquired for these encroachments.

L. Traffic Hazards and Permits

No permit shall be issued for any encroachment if it creates traffic hazard. Applicants will adhere to the manual on Uniform Traffic Control Devices, R-17-3-01. (Copy of which is on file with the Secretary of State).

No work shall be allowed without a properly approved permit.

DATED this 6th day of July, 1981.



E. F. SANDLIN
Deputy State Engineer
for Highway Operations

EFS/JEU/bk
Attachments - 10 Exhibits

Arizona Department of Transportation

**STANDARD
SPECIFICATIONS**

for
**ROAD AND BRIDGE
CONSTRUCTION**

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The criteria for establishing the existence of Red Flag Conditions is when sustained high winds are predicted or are occurring. A Red Flag Day identifies those few critical days throughout the fire season that strong winds and low humidity constitute an unusual threat to the National Forest resources.

Under unusually severe conditions or with operations that constitute an unusual risk, the District Ranger may institute any or all of the above stipulations, or he/she may require additional action in certain specialized cases.

In specific instances where it can be adequately demonstrated that little or no risk is incurred, the District Ranger may permit certain construction activities to take place under carefully controlled conditions.

107.14 Prevention of Air and Noise Pollution:

The contractor shall control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work.

The contractor shall comply with the applicable requirements of Title 49 - Public Health and Safety, Chapter 3, Air Quality, of the Arizona Revised Statutes and with the Arizona Administrative Code, Title 18 - Environmental Quality, Chapter 2, Air Pollution Control and Chapter 3, Air Pollution Control Hearing Board, adopted by the Arizona Department of Environmental Quality pursuant to the authority granted by the Statutes.

The contractor shall comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract.

Each internal combustion engine used for any purpose on the work or related to the work shall be equipped with a muffler of a type recommended by the manufacturer. No internal combustion engine shall be operated on the work without its muffler in good working condition.

107.15 Prevention of Landscape Defacement; Protection of Streams, Lakes and Reservoirs:

The contractor shall give special attention to the effect of the contractor's operations upon the landscape and shall take special care to maintain natural surroundings undamaged.

The contractor shall take sufficient precautions, considering various conditions, to prevent pollution of streams, lakes, and reservoirs with fuels, oil, bitumens, calcium chloride, fresh portland cement, fresh portland cement concrete, raw sewage, muddy water, chemicals or other harmful materials. None of these materials shall be discharged into any channels leading to such streams, lakes or reservoirs.

Where the contractor's working area encroaches on a running or an intermittent stream, barriers shall be constructed and maintained between the working areas and the stream or stream bed adequate to prevent the discharge of any contaminants into the stream or stream bed.

Frequent fording of running streams with construction equipment will not be permitted; therefore, temporary bridges or other structures shall be used whenever an appreciable number of crossings is necessary.

Unless approved in writing by the Engineer, mechanical equipment shall not be operated in running streams.

Streams, lakes and reservoirs shall be promptly cleared of all falsework, piling, debris or other obstructions placed thereby or resulting from construction operations.

At the time of the preconstruction conference, the contractor shall submit, for the Engineer's approval, a program which includes all the measures which the contractor proposes to take for the construction of permanent erosion control work specified in the contract and all the temporary control measures to prevent erosion and pollution of streams, lakes and reservoirs.

Permanent erosion control work and pollution prevention measures shall be performed at the earliest practicable time consistent with good construction practices. Temporary work and measures are not meant to be performed in lieu of permanent work specified in the contract.

Construction of drainage facilities as well as the performance of other contract work which will contribute to the control of erosion and sedimentation shall be carried out in conjunction with earthwork operations or as soon thereafter as possible.

Except for that approved in writing by the Engineer, the contractor shall perform no clearing and grubbing or earthwork until the contractor's program has been approved.

If in the opinion of the Engineer, clearing and grubbing, excavation, or other construction operations are likely to create an erosion problem because of the exposure of erodible earth material, the Engineer may limit the surface area to be disturbed until satisfactory control measures have been accomplished. Unless otherwise permitted by the Engineer, the contractor shall not expose an area of erodible earth material greater than 750,000 square feet at any one location.

The Engineer may order the contractor to provide immediate measures to control erosion and prevent pollution. Such measures may involve the construction of temporary berms, dikes, dams, sediment basins and slope drains; the use of temporary mulches, mats and seeds and the use of other devices, methods, items, etc., as necessary.

At any time the contractor proposes to change his/her schedule of operations, the contractor shall review and update his/her erosion and pollution control program and submit it to the Engineer for approval.

The contractor shall not be entitled to additional compensation or an extension of contract time for any delays to the work because of the contractor's failure to submit an acceptable erosion and pollution control program.

Erosion control and pollution prevention work specified in the contract which is to be accomplished under any of the various contract items will be paid for as specified under those items.

The cost of any erosion control and pollution prevention work which may be proposed by the contractor in his/her program, in addition to that specified in the contract, will be considered as included in the prices bid for contract items.

107.16 Responsibility for Damage Claims:

The contractor shall indemnify, defend, and save harmless the State of Arizona, acting by and through the Arizona Department of Transportation, from any and all claims, demands, suits, actions, proceedings, loss, cost and damages of every kind and description, including any attorneys' fees and/or litigation expenses, which may be brought or made against or incurred by the Department on account of loss of or damage to any property or for injuries to or death of any person, caused by, arising out of, or contributed to, in whole or in part, by reasons of any alleged act, omission, professional error, fault, mistake, or negligence of the contractor, its employees, agents, representatives, or subcontractors, their employees, agents, or representatives in connection with or incident to the performance of the work, or arising out of Workmen's Compensation claims, Unemployment Compensation claims, or Unemployment Disability Compensation claims of employees of the contractor and/or its subcontractors or claims under similar such laws or obligations. The contractor's obligation under this Subsection shall not extend to any liability caused by the sole negligence of the Department, or its employees.

The contractor shall indemnify, defend and save harmless any county or incorporated city, its officers and employees, within the limits of which county or incorporated city work is being performed, all in the same manner and to the same extent as provided in the above paragraph.

107.17 Insurance:

Prior to the execution of the contract, the contractor shall file with the Department a certificate or certificates of insurance executed by an insurance company doing business in the State of Arizona and acceptable to the Department. The certificate of insurance shall be on the form provided by the Department and shall

state that with respect to the contract awarded the contractor, the contractor carries insurance in accordance with the requirements of this Subsection.

Without limiting any liabilities or any other obligations of the contractor, the contractor shall provide and maintain, if commercially available, the minimum insurance coverage listed below until all obligations under this contract are satisfied:

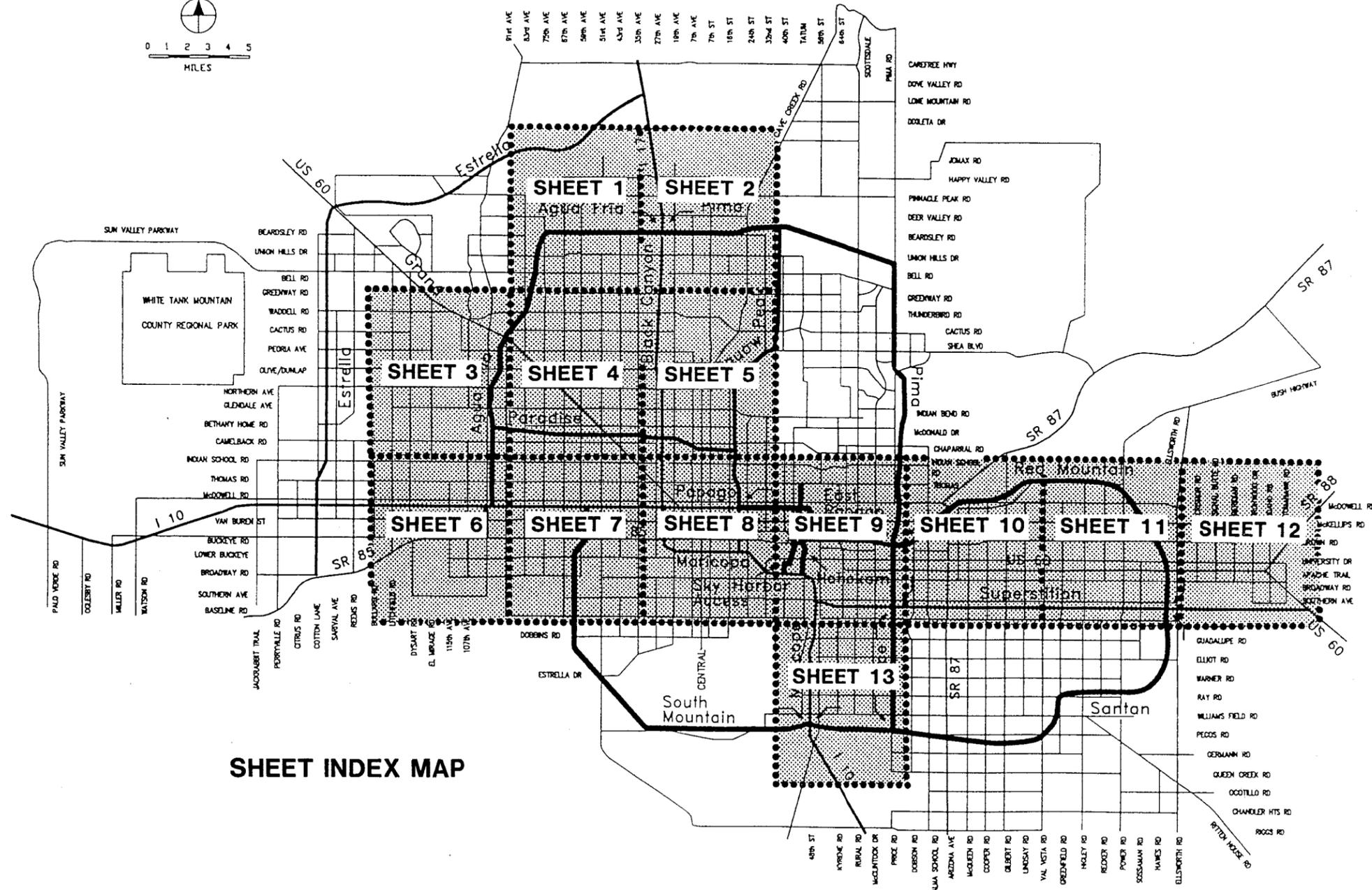
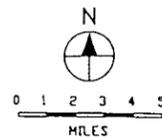
- (1) General Liability insurance with a minimum combined single limit of \$1,000,000.00 each occurrence applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contractors, products and completed operations. Further, the policy shall include coverage for the hazards commonly referred to as XCU (explosion, collapse and underground). The products and completed operations coverage shall extend for one year past acceptance, cancellation or termination of the work. The policy shall contain a severability of interests provision.
- (2) Comprehensive Automobile Liability insurance with a combined single limit for bodily injury and property of not less than \$1,000,000.00 each occurrence with respect to contractor's owned, hired, or non-owned vehicles, assigned to or used in performance of the work.
- (3) Workers' Compensation insurance to cover obligations imposed by Federal and State statutes having jurisdiction of its employees engaged in the performance of the work, and Employers' Liability insurance with a minimum limit of \$100,000.00. Evidence of qualified self-insured status will suffice for this section.

The policies required by 1 and 2 above shall be endorsed to include the Department, its agents, officials, employees and the State of Arizona as additional insureds and shall stipulate that the insurance afforded the contractor shall be primary insurance and that any insurance carried by the Department, its agents, officials, employees or the State of Arizona shall be excess and not contributory insurance to that provided by the contractor as provided by Arizona Revised Statute 41-621C.

All insurance policies or certificates shall include a requirement providing for 30 days prior written notice to the Department of any cancellation or reduction of coverage. The contractor shall cease operations on the occurrence of any such cancellation or reduction and shall not resume operations until the required insurance is in force and new certificates of insurance have been filed with the Department.

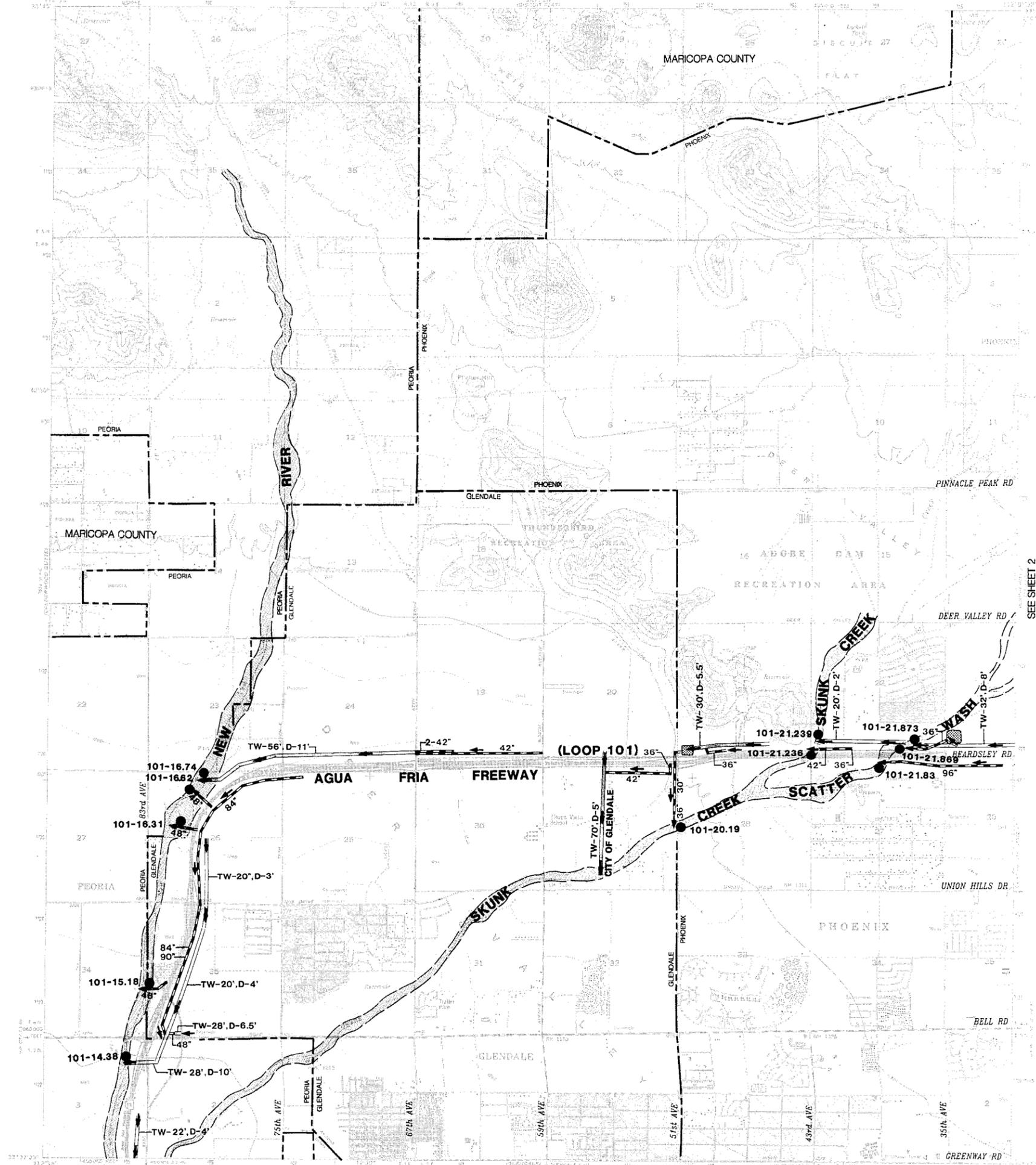
**Maps of Drainage
System and Major
Outfalls - Phoenix Area**

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



SHEET INDEX MAP

MARICOPA COUNTY



SEE SHEET 2

SEE SHEET 4

Mapped, edited, and published by the Geological Survey
Control by URS and MODS/DCA
Topography from aerial photography by raster plotter and
planimetry surveys 1997, 1998 photographs taken 1993
planimetry projection 1983 UTM and 1983 based on
Arizona coordinate system, datum 1983
LIDAR data provided by the Arizona Department of
Transportation, 1997 North American Datum 1983
to project on the present North American Datum 1983
more the projection lines 2 meters south and
60 meters east to correct for datum errors.
There may be slight variations within the boundaries of
the Material or State's jurisdiction shown on this map.

ROAD CLASSIFICATION
Met road
Light road
Unimproved road

CONTOUR INTERVAL 20 FEET
ELEVATION IN FEET
VERTICAL CURVATURE
NATIONAL GEODESIC SURVEY SYSTEM OF 1983

PHOENIX
GLENDALE
CITY OF GLENDALE
CITY OF PHOENIX (TEMPE)

AGUA FRIA FREEWAY
NEW RIVER
SKUNK CREEK
SCATTER CREEK
SKUNK CREEK
WASH CREEK

101-16.74
101-16.82
101-16.31
101-15.18
101-14.38
101-21.239
101-21.236
101-21.873
101-21.868
101-21.83
101-20.19

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



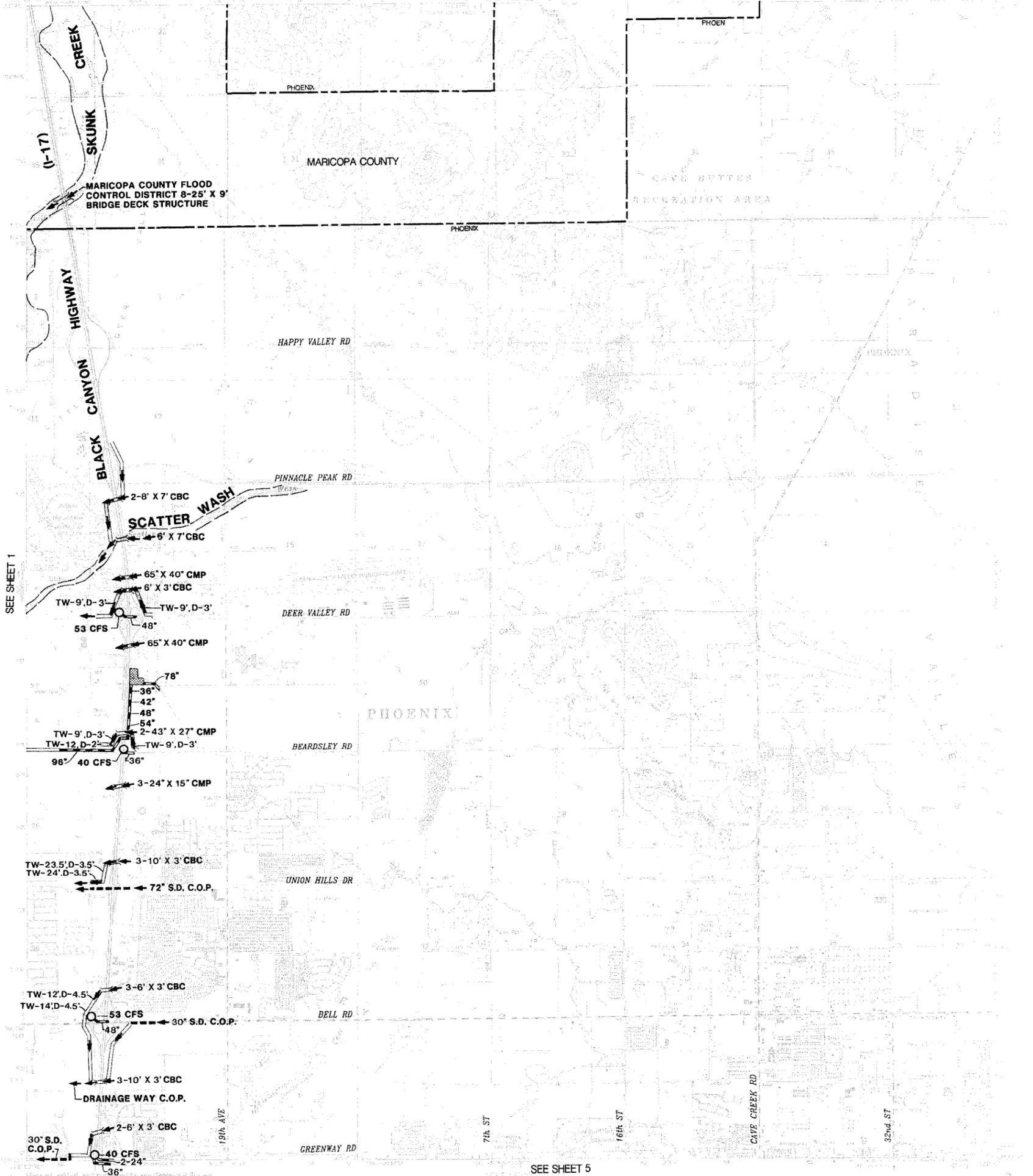
LEGEND

- | | | | |
|--------------|--|--|--------------------------|
| TW-48', D-8' | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | | DETENTION BASIN |
| 48' | ADOT STORM DRAIN PIPE (48' DIA.) | | RETENTION BASIN |
| | OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| | DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| | PUMP STATION (15 CFS CAPACITY) | | CONCRETE BOX CULVERT |
| | MAJOR OUTFALL WITH IDENTIFIER | | REINFORCED CONCRETE PIPE |
| | DIRECTION OF FLOW | | CORRUGATED METAL PIPE |
| | CROSS DRAINAGE STRUCTURE | | STORM DRAIN |
| | DROP STRUCTURE | | CITY OF PHOENIX (TEMPE) |



NOVEMBER 1991

The WLB Group



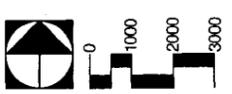
SEE SHEET 1

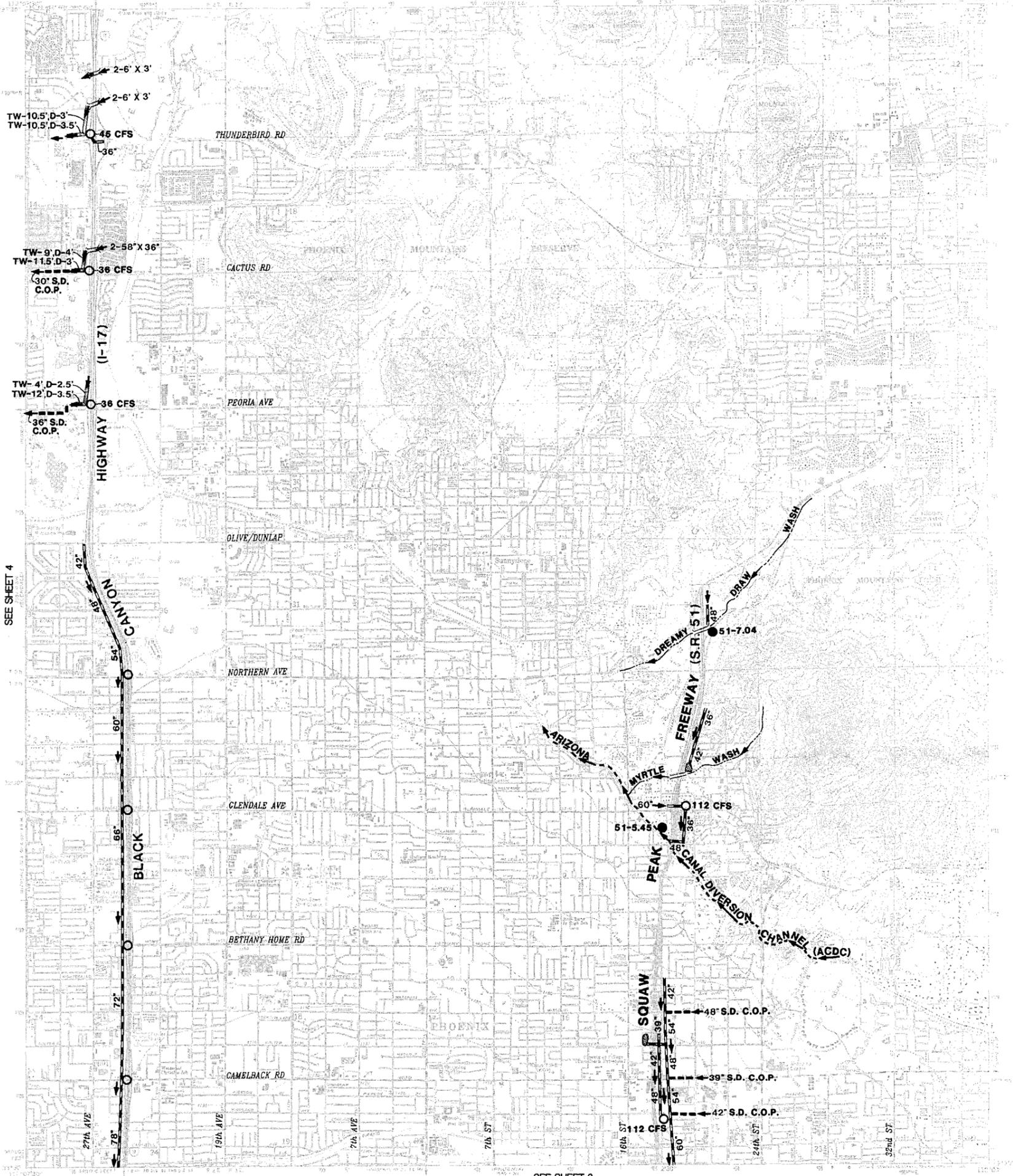
SEE SHEET 5

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX

LEGEND

<p>TW-48', D-8' 48" ----- ----- ----- ----- ○ 15 CFS ● 101-1 ← ← ← ← ← → ← → *</p>	<p>OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') ADOT STORM DRAIN PIPE (48" DIA.) OTHER AGENCY STORM DRAIN PIPE DRAINAGE TUNNEL PUMP STATION (15 CFS CAPACITY) MAJOR OUTFALL WITH IDENTIFIER DIRECTION OF FLOW CROSS DRAINAGE STRUCTURE DROP STRUCTURE</p>	<p>----- ----- ----- ----- ○ ● ← ← ← ← ← → ← → *</p>	<p>DETECTION BASIN RETENTION BASIN FLOODWAY BOUNDARY MUNICIPAL BOUNDARY CBC RCP CMP S.D. C.O.P. (C.O.T.)</p>	<p>CONCRETE BOX CULVERT REINFORCED CONCRETE PIPE CORRUGATED METAL PIPE STORM DRAIN CITY OF PHOENIX (TEMPE)</p>
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SEE SHEET 4

SEE SHEET 8

Mapped, edited, and published by the Geological Survey
funded by USGS, ARIZONA, and U.S. Bureau of Reclamation
Topography by photogrammetric methods from aerial
photography taken 1962. Field checked 1985.
Subsidence evaluations, 10,000-foot grid lines based on
vertical measurements at various control points.
1:50,000-scale horizontal projection for grid lines.
New 12, 100-foot grid lines (NAD 83) shown. Vertical datum
is plane which predicted North American Datum 1983
mean sea level projection was 2 meters above and
62 meters below as shown by dashed circle lines.
Flow and drainage areas in which only buildings, etc. shown
There may be some buildings within the boundaries of
the National or State Reservations shown on this map.

SCALE 2:48,000
SUNNYVALE, CALIF. FILE
UNITED STATES GEOLOGICAL SURVEY
NATIONAL GEOGRAPHIC SURVEY OF 1987
THIS MAP COMES WITH THE ORIGINAL MAP IN SHEETS 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
FOR SALE BY U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR, WASHINGTON, DC 20508.
A 1:50,000-scale topographic map and symbols in accordance with the
Public Land Survey System of 1983.

RAMP: GLETT BRIDGE
Primary highway, all other
Secondary highway, all other
Private Road
U.S. Route
State Route

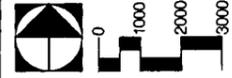
SUNNYVALE, ARIZ.
N 33° 00' 00" W 101° 15' 00" E
1:50,000
PHOTOGRAPHIC 1:50,000
DATE 1985

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



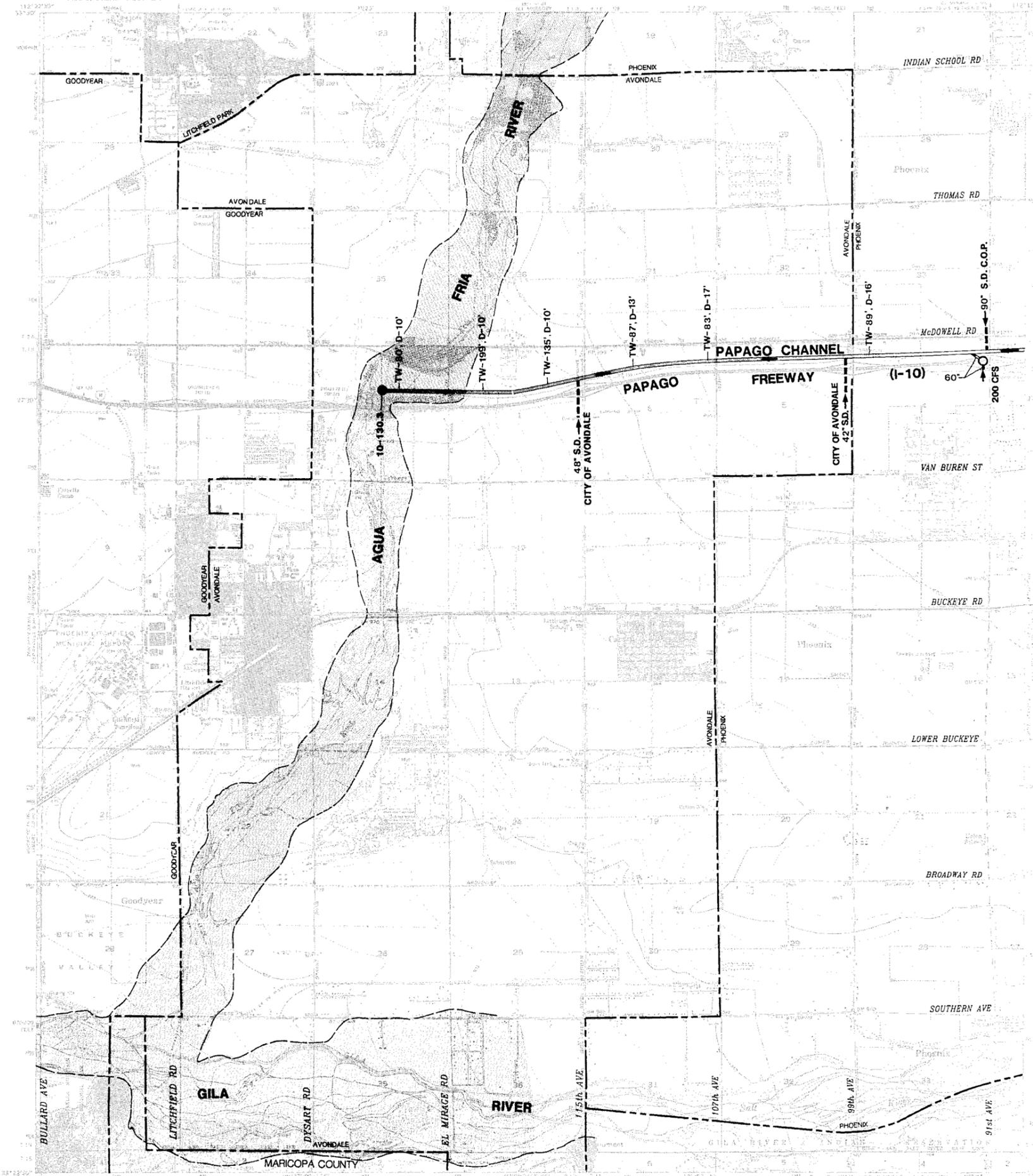
LEGEND

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|---------------------|--|--|--------------------------|
| TW-48', D-8' | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | | DETENTION BASIN |
| | ADOT STORM DRAIN PIPE (48" DIA.) | | RETENTION BASIN |
| | OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| | DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| | PUMP STATION (15 CFS CAPACITY) | | CONCRETE BOX CULVERT |
| | MAJOR OUTFALL WITH IDENTIFIER | | REINFORCED CONCRETE PIPE |
| | DIRECTION OF FLOW | | CORRUGATED METAL PIPE |
| | CROSS DRAINAGE STRUCTURE | | STORM DRAIN |
| | DROP STRUCTURE | | CITY OF PHOENIX (TEMPE) |



NOVEMBER 1991

The WLB Group



Mapped, edited, and published by the Geological Survey
Control by URS and MDS/DGA
Aerial and ground control points used in this map were taken in 1994. Transforms by geospatial address 1597
Photometric projection. UTM projection and ticks based on Arizona coordinate system, zone 12N
1500-meter UTM zone. Azimuthal projection. Zone 12N, UTM projection. Datum 1983
Based on the datum of the Arizona State Plane
GS projection zone is shown by dashed corner ticks
Part of this map is based on aerial and ground control points
Location of points is shown
There may be private property within the boundaries of the National or State Reservations shown on this map

ROAD CLASSIFICATION
Primary Highway, Interstate, Arterial, Major Arterial, Minor Arterial, Collector, Local, Residential, Unimproved, Road, Fenced, No Fence, Other
Interstate Route, State Route, State Route
TOLLESON, ARIZ.
NEW AVONDALE, AZ
PHOENIX, ARIZ.
PROGRAMMED AND
DRAWN BY: WLB

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



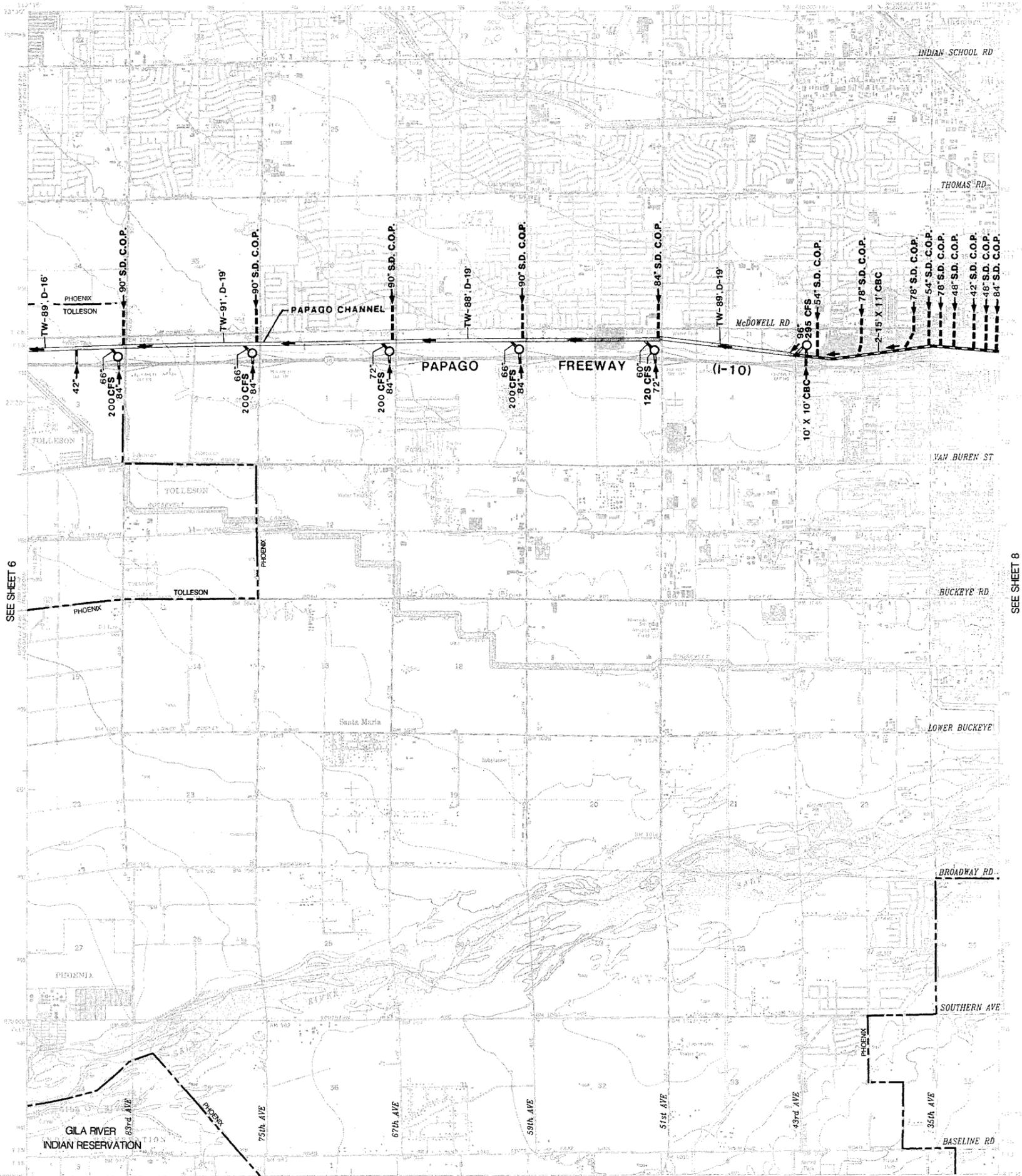
LEGEND

- | | | | |
|--|--|--|--------------------------|
| | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | | DETENTION BASIN |
| | ADOT STORM DRAIN PIPE (48' DIA.) | | RETENTION BASIN |
| | OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| | DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| | PUMP STATION (15 CFS CAPACITY) | | CONCRETE BOX CULVERT |
| | MAJOR OUTFALL WITH IDENTIFIER | | REINFORCED CONCRETE PIPE |
| | DIRECTION OF FLOW | | CORRUGATED METAL PIPE |
| | CROSS DRAINAGE STRUCTURE | | STORM DRAIN |
| | DROP STRUCTURE | | CITY OF PHOENIX (TEMPE) |



NOVEMBER 1991

The WLB Group



SEE SHEET 6

SEE SHEET 8

Maped by the Army Map Service
Published for direct use by the Geological Survey
Control by USGS, HOSNAGA and USOT
Topography by photogrammetric methods from aerial
photographs taken 1961. Field checked 1972-1985
Polymer projection, 10,000-foot grid. Level based on
mean sea level system. Contour interval
100-foot intervals. Triangulation base station
zone 16, shown in blue. 1927 North American Datum. 200
feet above the projected North American Datum. 200
feet above the projected North American Datum. 200
feet above the projected North American Datum.
Red line indicates area in which only temporary
disturbance is shown.
They may be private holdings within the boundaries of
the National or State Reservations shown on this map.



THIS MAP IS LIMITED TO NATIONAL HIGHWAY ACQUISITION PURPOSES
FOR SALE BY U.S. GEOLOGICAL SURVEY, FEDERAL CENTER, RESTON, VIRGINIA 20192
* OTHER TECHNICAL INFORMATION MAY BE AVAILABLE ON REQUEST

ROAD CLASSIFICATION
Highway
Mediumway
Local Road
Lightly
Unimproved
State Road
U.S. Route
State Route
FOWLER, ARIZ.
NADA 1000000 1000000
PHOTOGRAPHIC
DATE 1972-1985
DATE 1972-1985

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX

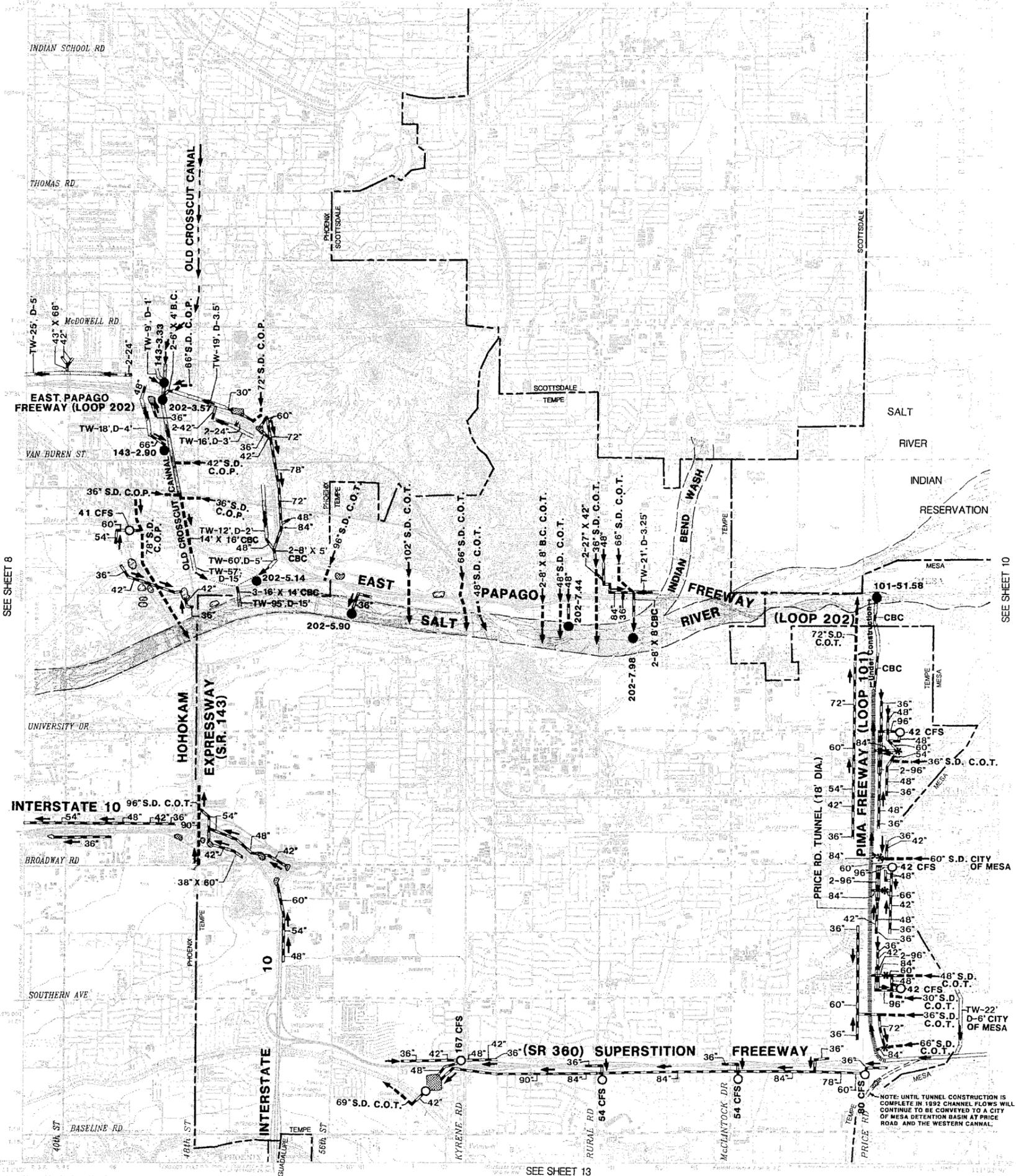
LEGEND

- | | | | |
|--|---|--|--|
| <p>TW-48', D-8'</p> <p>48"</p> <p>-----</p> <p>-----</p> <p>○ 15 CFS</p> <p>● 101-1</p> <p>←</p> <p>←</p> <p>*</p> | <p>OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')</p> <p>ADOT STORM DRAIN PIPE (48" DIA.)</p> <p>OTHER AGENCY STORM DRAIN PIPE</p> <p>DRAINAGE TUNNEL</p> <p>PUMP STATION (15 CFS CAPACITY)</p> <p>MAJOR OUTFALL WITH IDENTIFIER</p> <p>DIRECTION OF FLOW</p> <p>CROSS DRAINAGE STRUCTURE</p> <p>DROP STRUCTURE</p> | <p>▨</p> <p>▨</p> <p>▨</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> | <p>DETENTION BASIN</p> <p>RETENTION BASIN</p> <p>FLOODWAY BOUNDARY</p> <p>MUNICIPAL BOUNDARY</p> <p>CBC</p> <p>RCP</p> <p>CMP</p> <p>S.D.</p> <p>C.O.P. (C.O.T.)</p> |
|--|---|--|--|



NOVEMBER 1991

The WLB GROUP



SEE SHEET 8

SEE SHEET 10

SEE SHEET 13

Maped by the Army Map Service
Prohibited for civil use by the Geological Survey
Scales in miles, kilometers and feet
Topographic by photogrammetric methods from aerial
photographs taken 1951. Final checked 1952
Photocopy available. \$7.000 per set. Includes an
Arizona contour map, road map, and
topographic map of the Phoenix area. The set is
available in black and white. Army Map Service
To order see the publication North American Catalog 1954
order the publication in its 2 volume set and
\$5.000 set to obtain by request contact
Red line indicates when in urban areas. Buildings are shown
They may be present but not within the boundaries of
the National or State rivers which, when not
shown, are shown as dashed lines.

ARIZONA DEPARTMENT OF TRANSPORTATION
DRAINAGE SYSTEM AND MAJOR OUTFALLS
IN METROPOLITAN PHOENIX

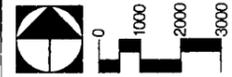
ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX

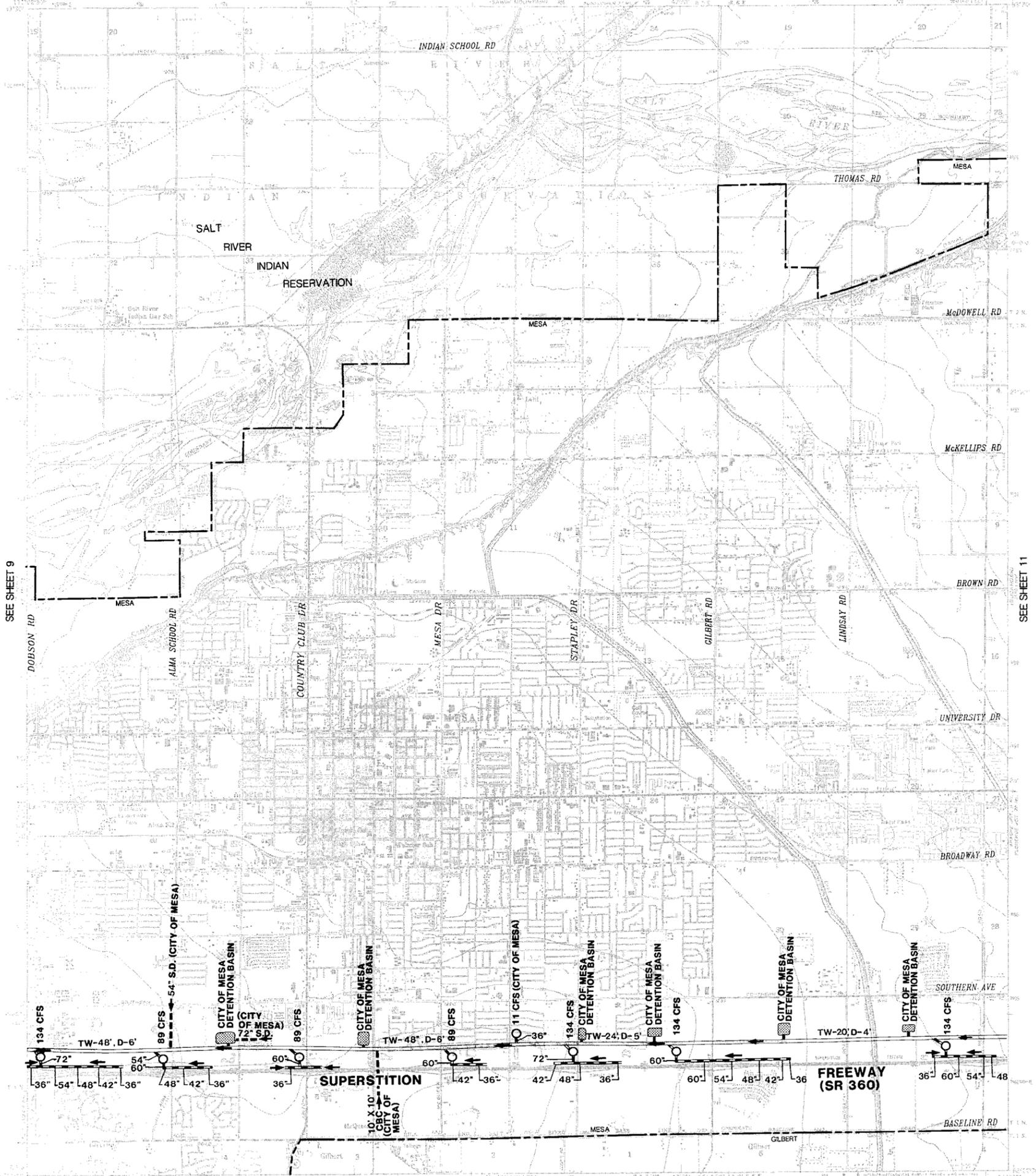
LEGEND

- | | | | |
|--|--|--|--------------------------|
| | OPEN CHANNEL (TOP WIDTH 48", DEPTH 8") | | DETENTION BASIN |
| | ADOT STORM DRAIN PIPE (48" DIA) | | RETENTION BASIN |
| | OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| | DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| | PUMP STATION (15 CFS CAPACITY) | | CONCRETE BOX CULVERT |
| | MAJOR OUTFALL WITH IDENTIFIER | | REINFORCED CONCRETE PIPE |
| | DIRECTION OF FLOW | | CORRUGATED METAL PIPE |
| | CROSS DRAINAGE STRUCTURE | | STORM DRAIN |
| | DROP STRUCTURE | | CITY OF PHOENIX (TEMPE) |

NOTE: UNTIL TUNNEL CONSTRUCTION IS
COMPLETE IN 1992 CHANNEL FLOWS WILL
CONTINUE TO BE CONVEYED TO A CITY
OF MESA DETENTION BASIN AT PRICE
ROAD AND THE WESTERN CANAL.

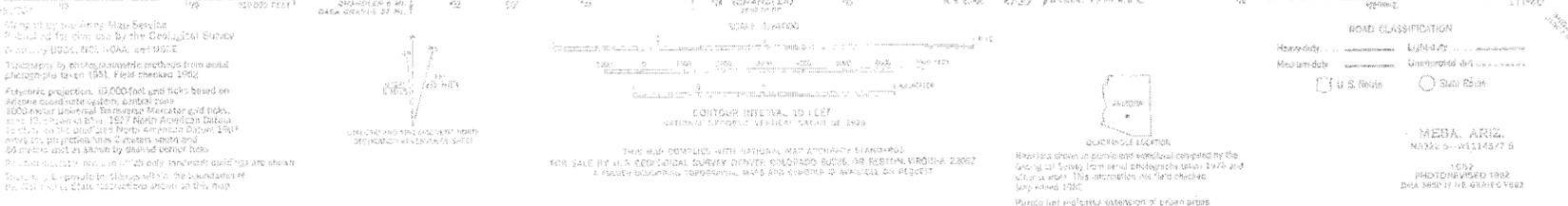
NOVEMBER 1991





SEE SHEET 9

SEE SHEET 11

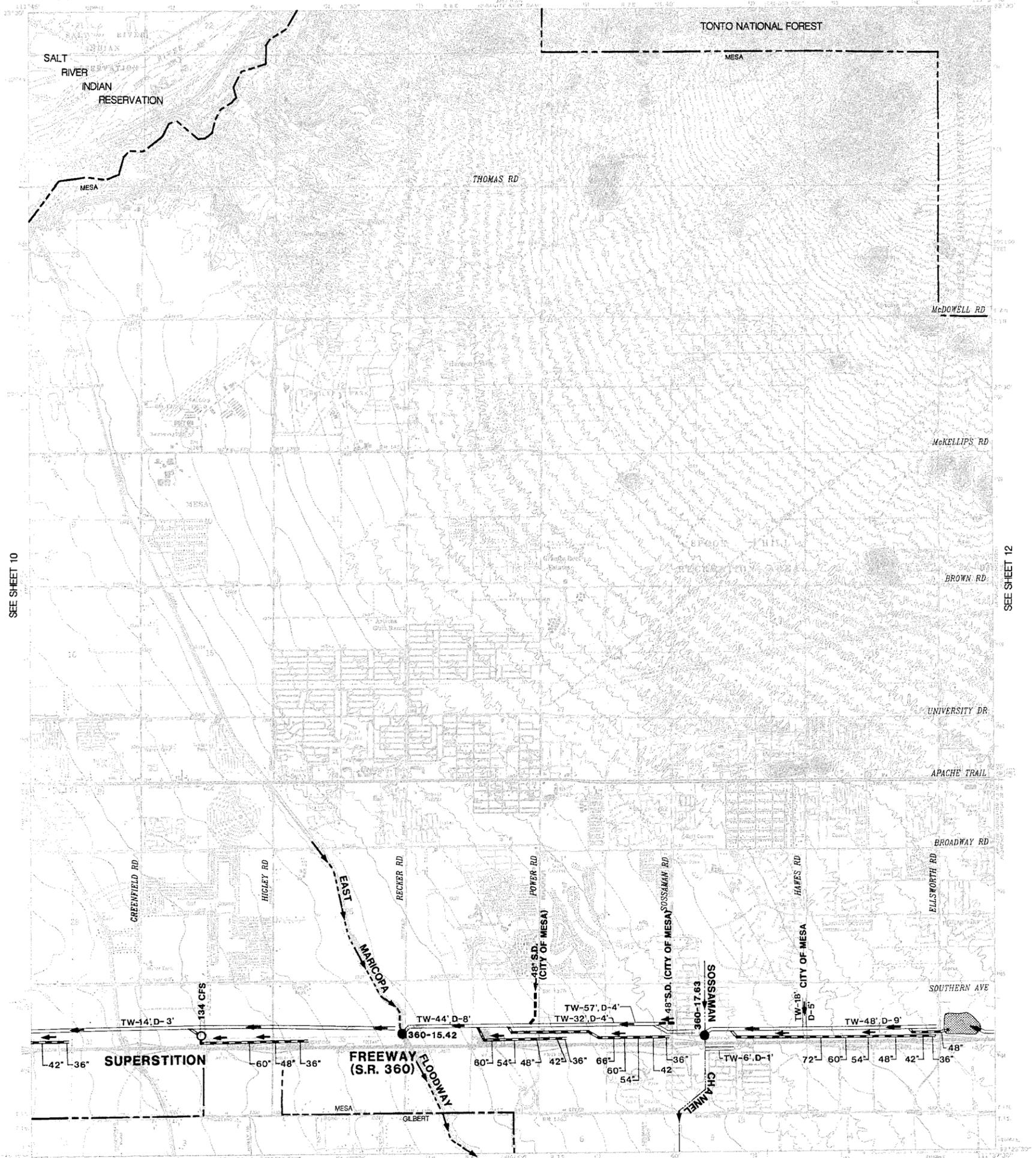


ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



LEGEND			
	OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')		RETENTION BASIN
	ADOT STORM DRAIN PIPE (48" DIA.)		RETENTION BASIN
	OTHER AGENCY STORM DRAIN PIPE		FLOODWAY BOUNDARY
	PUMP STATION (15 CFS CAPACITY)		MUNICIPAL BOUNDARY
	MAJOR OUTFALL WITH IDENTIFIER		CONCRETE BOX CULVERT
	DIRECTION OF FLOW		REINFORCED CONCRETE PIPE
	CROSS DRAINAGE STRUCTURE		CORRUGATED METAL PIPE
	DROP STRUCTURE		STORM DRAIN
			CITY OF PHOENIX (TEMPE)

NOVEMBER 1991



SEE SHEET 10

SEE SHEET 12

Map made by the Army Map Service, Washington, D.C., and the Geological Survey, Tucson, AZ, 1963. NG2 ND48 and 151-C. Topography by photogrammetric methods from aerial photographs taken 1955. Grid UTM 125E. Polyconic projection. 30,000-foot grid based on Arizona standard spheroid. Contour interval 100 meters. Underlines indicate drainage and flow. 2000, 10, and 5000 ft. 1927 North American Datum. To show the projection error, a graphic scale and 54 meters apart is shown by dashed corner ticks. There are no water features within the boundaries of this quadrangle. State boundaries shown in thin purple. Purple hatched areas represent urban areas.

Contours show in solid and dashed lines by the reference. Survey data and photographs taken 1975 and 1976. This map is not to be used for navigation. Map scale 1:50,000. Purple hatched areas represent urban areas.

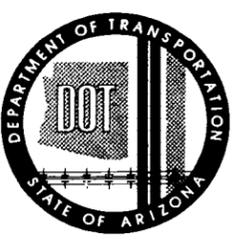
This map complies with National Map Accuracy Standards for a Geological Survey Service (NGS) 7.5-MINUTE QUADRANGLE. A graphic scale is provided. Map scale 1:50,000. National Geographic Society, Washington, D.C., 1975.

ROAD CLASSIFICATION
 Major roads
 Secondary roads
 U.S. Road
 BUCKHORN, ARIZ.
 NG2 ND48 151-C
 PHOTOGRAPHED 1975
 MAP SCALE 1:50,000

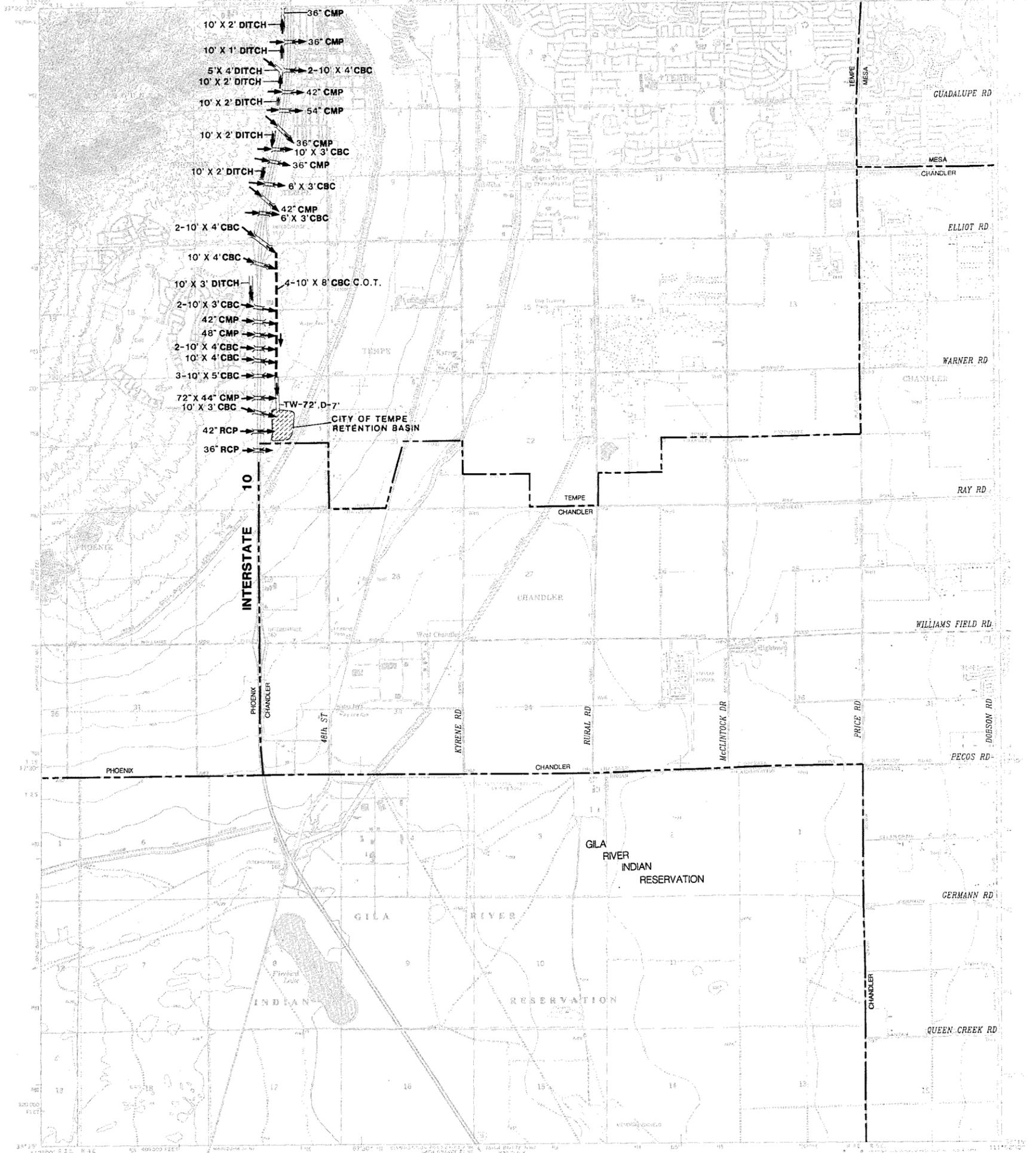
ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX

LEGEND

- | | | | |
|--|--|--|--------------------------|
| | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | | RETENTION BASIN |
| | ADOT STORM DRAIN PIPE (48" DIA) | | FLOODWAY |
| | OTHER AGENCY STORM DRAIN PIPE | | MUNICIPAL BOUNDARY |
| | DRAINAGE TUNNEL | | CONCRETE BOX CULVERT |
| | PUMP STATION (15 CFS CAPACITY) | | REINFORCED CONCRETE PIPE |
| | MAJOR OUTFALL WITH IDENTIFIER | | CORRUGATED METAL PIPE |
| | DIRECTION OF FLOW | | STORM DRAIN |
| | CROSS DRAINAGE STRUCTURE | | CITY OF PHOENIX (TEMPE) |
| | DROP STRUCTURE | | |



NOVEMBER 1991

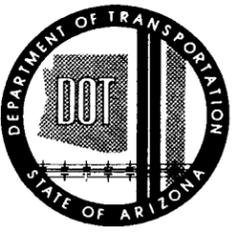


Mapped by the Aerial Map Service
Published for civil use by the Geological Survey
Control by USGS, NGS/NOAA and USCE
Topographic and photogrammetric data from aerial
photographs taken 1950. Photo control 1:50,000
Photographic projection, 10,000-foot grid based on
Kovalevsky coordinate system, United States
1929 meter datum. Horizontal accuracy is 10 feet,
vertical accuracy is 10 feet. Arizona-Arizona Datum
to place on the projected North American Datum 1983
datum the projection maps 2 meters (6.56 feet) and
6.56 meters (21.52 feet) by ground control lines.
There may be some irregularities within the boundaries of
the National or State relationships shown on this map.

Scale 1:24,000
CONTROLS INTERNAL TO FEET
NATIONAL GEODETIC SURVEY DATUM 1983
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80227 OR RESTON, VIRGINIA 22092
A POLAR PROJECTION TOPOGRAPHIC MAP AND VERTICAL IS AVAILABLE THROUGH THE PRODUCT

QUADRUANGLE LOCATION
QUADRUANGLE, ARIZ.
1:50,000
PHOTOGRAPHIC CONTROL
1:50,000
1:50,000

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN PHOENIX



LEGEND

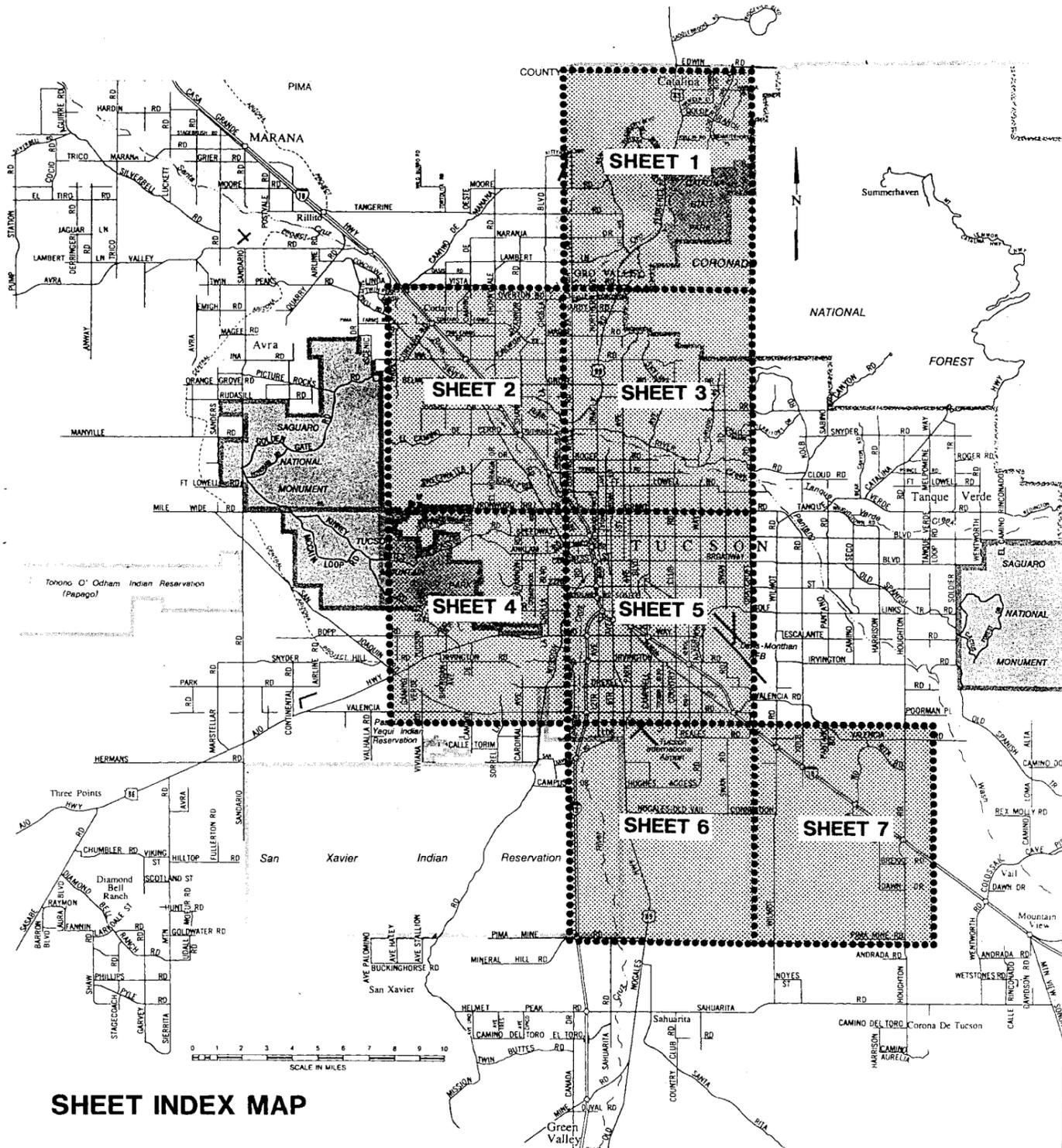
- | | | | |
|--------------|--|--|--------------------|
| TW-48', D-8' | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | | RETENTION BASIN |
| 48" | ADOT STORM DRAIN PIPE (48" DIA.) | | FLOODWAY BOUNDARY |
| | OTHER AGENCY STORM DRAIN PIPE | | MUNICIPAL BOUNDARY |
| | DRAINAGE TUNNEL | | CBC |
| | PUMP STATION (15 CFS CAPACITY) | | RCP |
| | MAJOR OUTFALL WITH IDENTIFIER | | CMP |
| | DIRECTION OF FLOW | | S.D. |
| | CROSS DRAINAGE STRUCTURE | | C.O.P. (C.O.T.) |
| | DROP STRUCTURE | | |



NOVEMBER 1991
The WLB Group

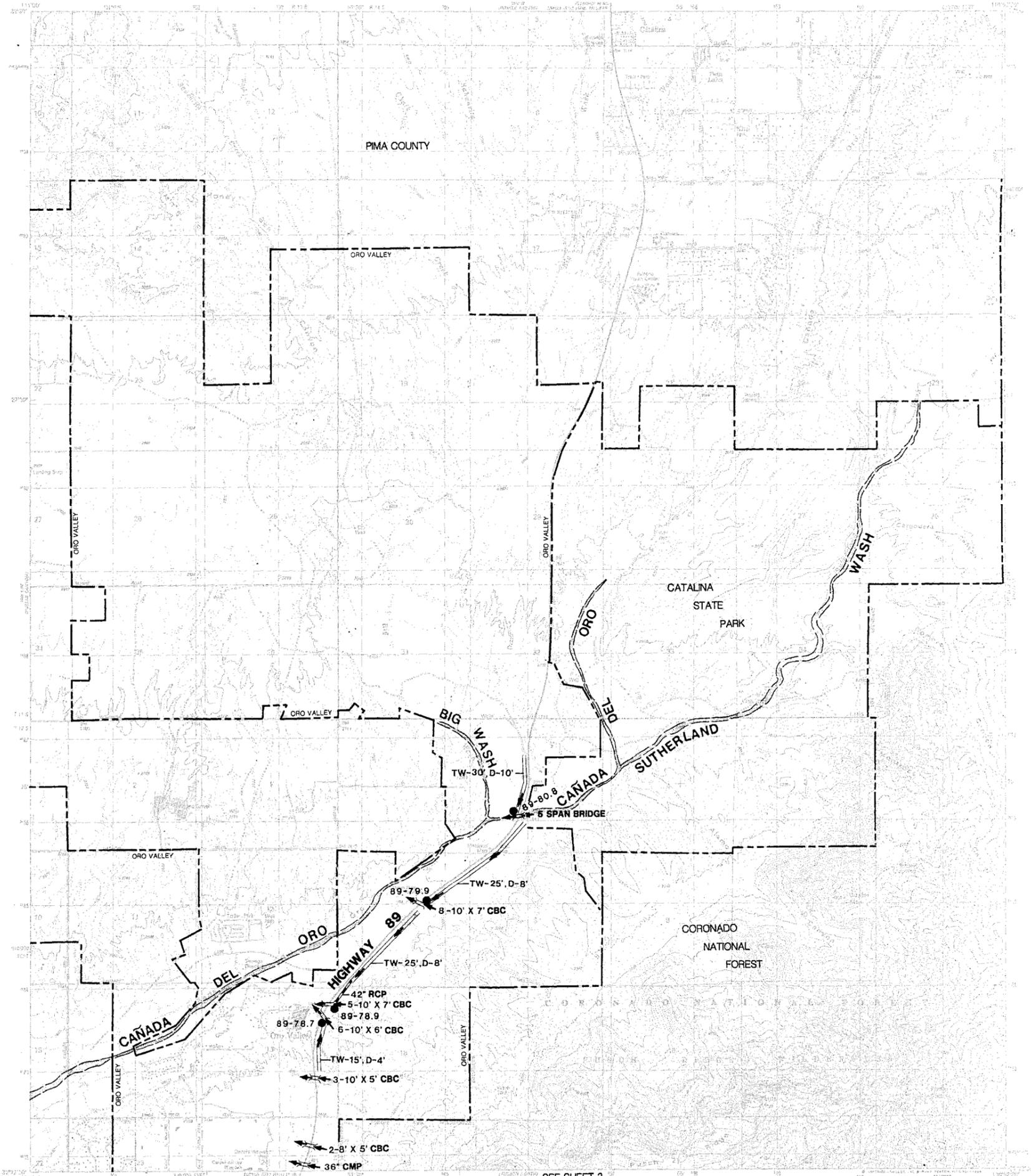
**Maps of Drainage
System and Major
Outfalls - Tucson Area**

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON



SHEET INDEX MAP

The WLB Group Inc. WLB
 Engineering • Planning • Surveying
 Landscape Architecture • Urban Design
 Offices located in Tucson, Phoenix, Las Vegas and Rancho Cucamonga, CA
 333 East Osborn Road, Suite 380
 Phoenix, Arizona 85012 (602) 279-1427



Map prepared, edited, and published by the Geological Survey Center by USGS and DOT-ARIZONA.

Topography by stereogram from aerial photographs taken 1976. Elevation 1000, 2000, 3000.

Projection: UTM (Universal Transverse Mercator) system, central meridian 109° 00' 00" W, zone 12N.

1000-meter Universal Transverse Mercator zone 12N, datum 1927 Mean Sea Level Datum.

The data on this published map were derived from 1983 aerial photography and 1984 ground truth data.

These data were processed by the National and State agencies, shown on this map.

Scale: 1:24,000

Contour Interval: 10 Feet

Vertical Datum: 1927 Mean Sea Level Datum

Horizontal Datum: Universal Transverse Mercator Datum, Zone 12N

Map Accuracy: This map conforms with National Map Accuracy Standards for sale by U.S. Geological Survey, Colorado, Sonora, or Boston, Virginia 22009.

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ORO VALLEY, ARIZ. 82114-B-10-001

1991

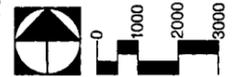
DATE 2010 BY N751-220010-001

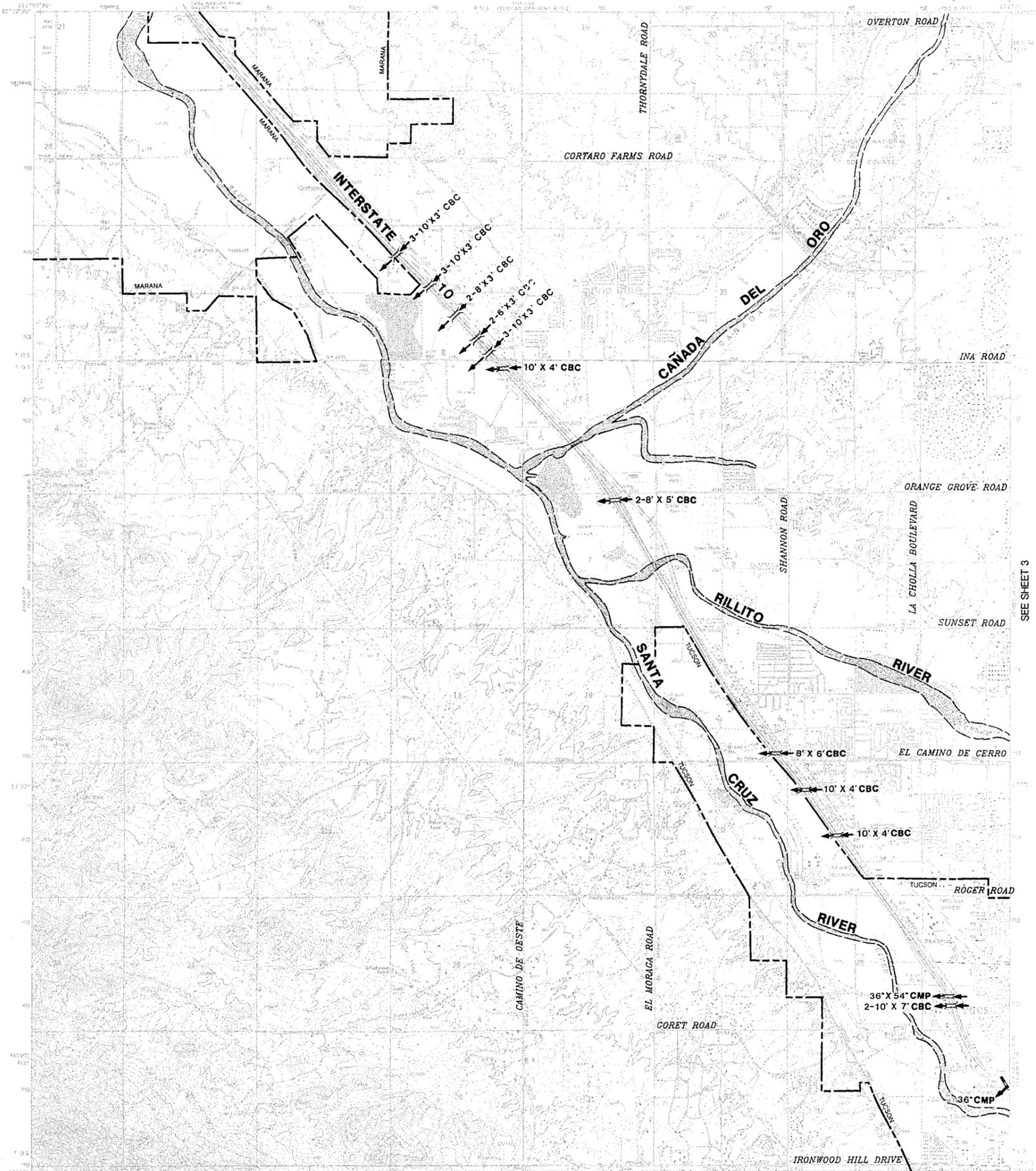
ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON

LEGEND

- | | | |
|-------------------------------|--|--------------------|
| TW-48', D-8' | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | DETENTION BASIN |
| 48' | ADOT STORM DRAIN PIPE (48' DIA.) | RETENTION BASIN |
| OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| 15 CFS | PUMP STATION (15 CFS CAPACITY) | CBC |
| 101-1.25 | MAJOR OUTFALL WITH IDENTIFIER | RCP |
| DIRECTION OF FLOW | | CMP |
| CROSS DRAINAGE STRUCTURE | | S.D. |
| DROP STRUCTURE | | C.O.T. |

NOVEMBER 1991

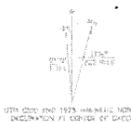




SEE SHEET 3

SEE SHEET 4

Mapped, edited, and published by the Geological Survey
Control by USGS and USGS/AGS
Topography by photogrammetric methods from aerial
photographs taken 1956. Field checked 1968.
Photographic projection: 1927 North American datum
10,000-foot grid based on Arizona state plane system, modified with
1000-meter Universal Transverse Mercator grid lines,
zone 13, shown as 5-foot
To state on the projected North American Datum 1983
more the projection datum 0 meters south and
60 meters east as shown by section corner ticks



THIS MAP COMPILED WITH ANTIPODAL MAP SCALARITY STANDARDS
TOP SCALE BY U.S. GEOLOGICAL SURVEY DRAINAGE RECORDING METHOD OF FEDERAL SURVEYING STANDARD 250-992
A FURTHER DRAINAGE RECORDING METHOD AND STANDARDS IS AVAILABLE ON REQUEST

Boundaries shown in purple compiled from aerial photographs
taken 1975. This information not held checked
Purple not delineates extension of urban areas

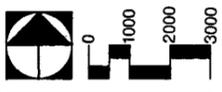
ROAD CLASSIFICATION
Heavy-duty Light-duty
Medium-duty Interrupted d.t.
Intermediate Road Safe Road
JAYNES, ARIZ.
1983
PHOTOGRAPHIC 1975
DATE 1/28/83 BY WLB/ML

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON

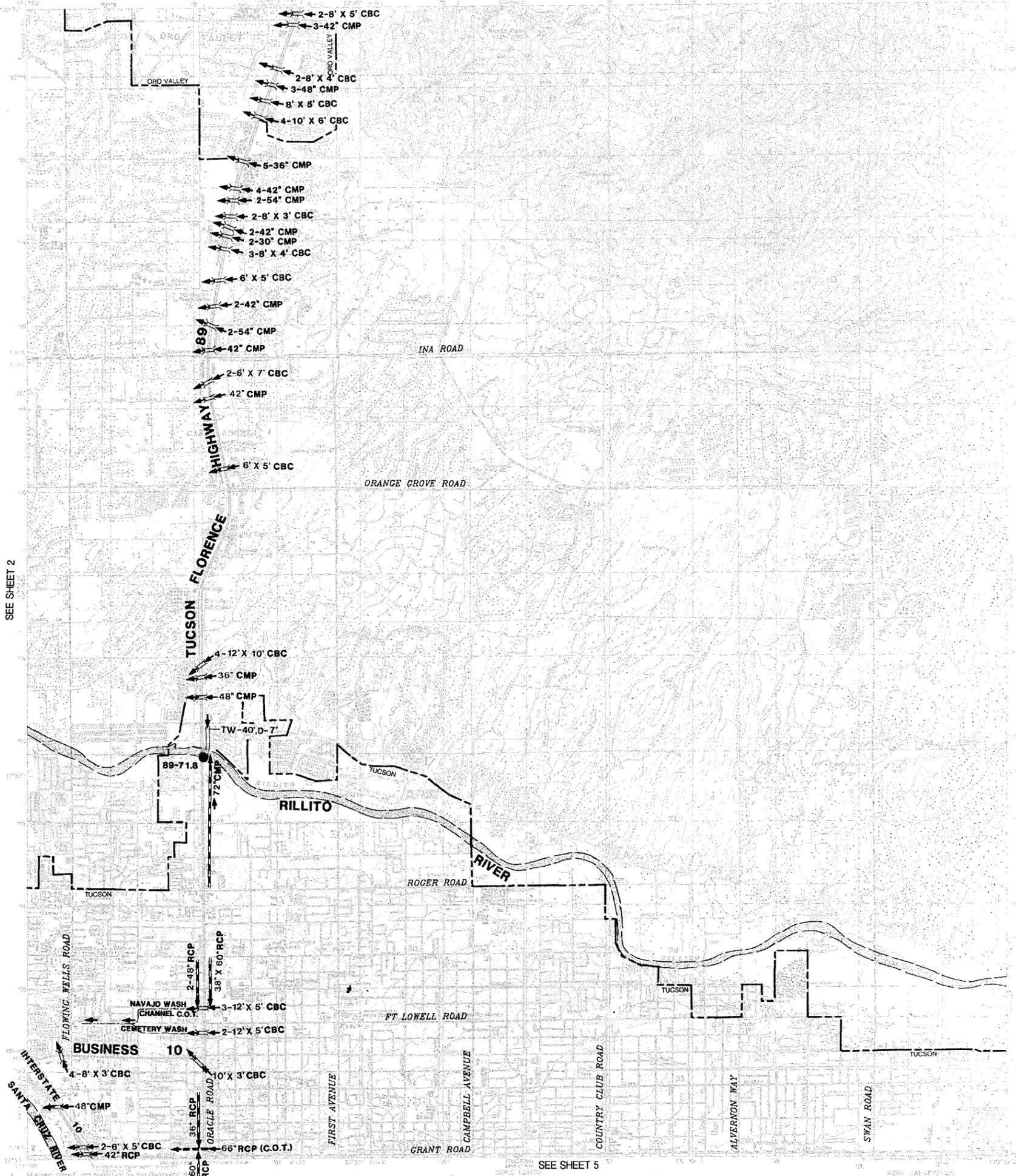


LEGEND

- | | | |
|-------------------------------|--|--------------------|
| TW-48' D-8' | OPEN CHANNEL (TOP WIDTH 48', DEPTH 8') | DETENTION BASIN |
| 48" | ADOT STORM DRAIN PIPE (48' DIA.) | RETENTION BASIN |
| OTHER AGENCY STORM DRAIN PIPE | | FLOODWAY BOUNDARY |
| DRAINAGE TUNNEL | | MUNICIPAL BOUNDARY |
| 15 CFS | PUMP STATION (15 CFS CAPACITY) | CBC |
| 101-1.25 | MAJOR OUTFALL WITH IDENTIFIER | RCP |
| DIRECTION OF FLOW | | CMP |
| CROSS DRAINAGE STRUCTURE | | S.D. |
| DROP STRUCTURE | | C.O.T. |



NOVEMBER 1991



SEE SHEET 2

SEE SHEET 5

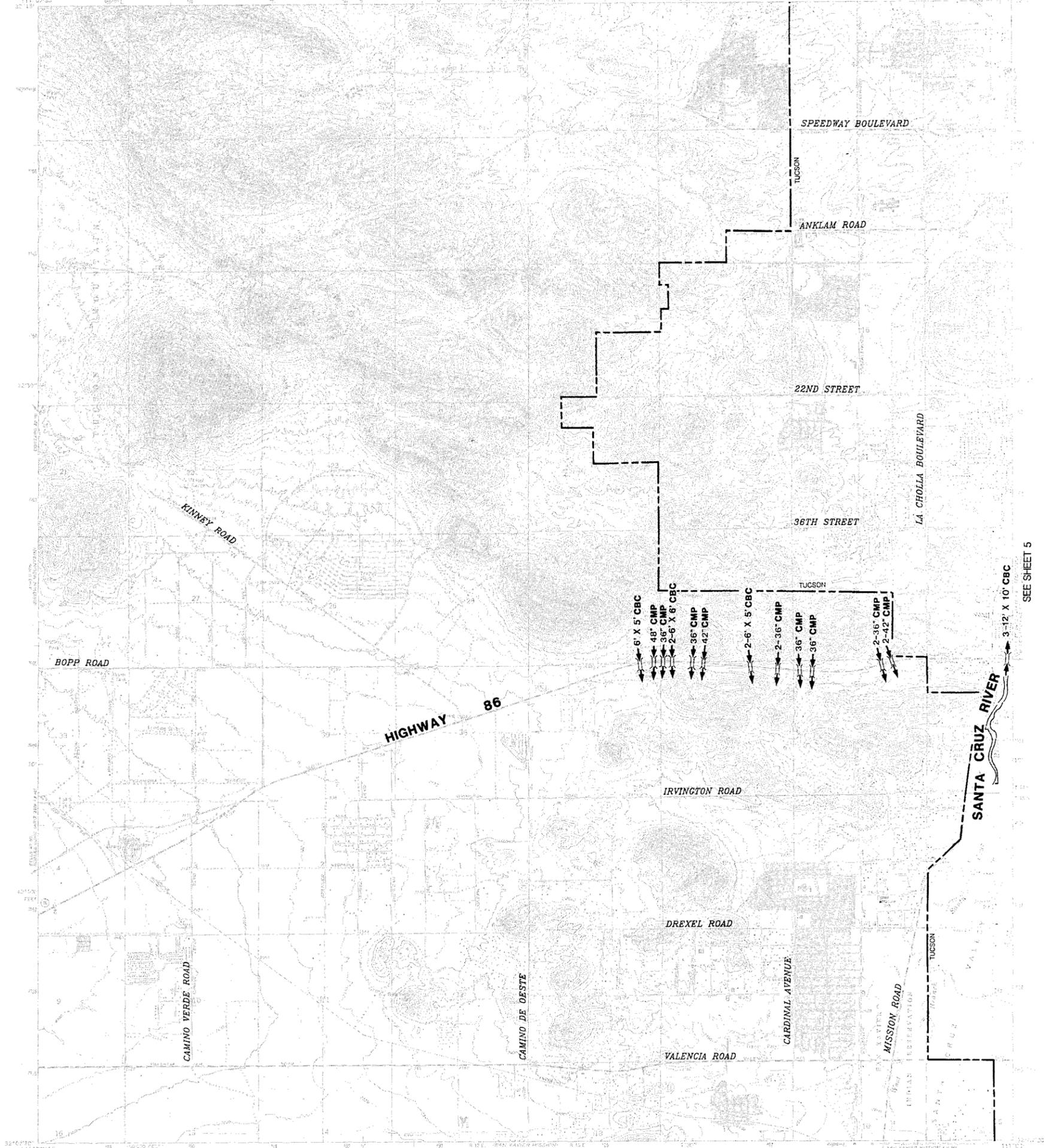
Map of Tucson, Arizona, showing drainage system and major outfalls. The map is based on the USGS 7.5 Minute Quadrangle Map of Tucson, Arizona, 1954. It shows the Rillito River, major roads, and various drainage structures including concrete box culverts (CBC), reinforced concrete pipes (RCP), corrugated metal pipes (CMP), storm drains (S.D.), and city of Tucson (C.O.T.) infrastructure. A legend at the bottom explains the symbols used for different types of drainage structures and basins. The map also includes a scale bar and a north arrow.

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON

LEGEND

	OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')		DETENTION BASIN
	ADOT STORM DRAIN PIPE (48" DIA.)		RETENTION BASIN
	OTHER AGENCY STORM DRAIN PIPE		FLOODWAY BOUNDARY
	DRAINAGE TUNNEL		MUNICIPAL BOUNDARY
	PUMP STATION (15 CFS CAPACITY)		CBC
	MAJOR OUTFALL WITH IDENTIFIER		RCP
	DIRECTION OF FLOW		CMP
	CROSS DRAINAGE STRUCTURE		S.D.
	DROP STRUCTURE		C.O.T.





SEE SHEET 5

Map made, edited, and published by the Geological Survey
Center by USGS and individuals.
Topography by stereographic methods from aerial
photographs taken 1956. Field checked 1969.
Polycon projection. 1927 North American datum.
U.S.G.S. road data based on Arizona state highway system, central zone
1:250,000 scale. Unimproved roads shown in blue.
Scale 1:250,000 in blue.
Red dots indicate areas in which water treatment buildings are shown.
Floodway shown in pink. Floodway shown in pink.
Reference shown in pink. Reference shown in pink.
Scale 1:250,000. This information has been checked.
Scale 1:250,000. This information has been checked.



CONTOUR INTERVAL 20 FEET
VERTICAL CURVE INTERVALS 10 FEET
NATIONAL TRIANGULATION SYSTEM 1983

ROAD CLASSIFICATION
Main road
Unimproved road
State Road

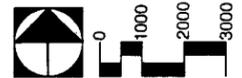
CAT MOUNTAIN AREA
TUCSON, ARIZONA
1938
HYDROGRAPHIC 1:250,000
500 SCALE 1:250,000

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON



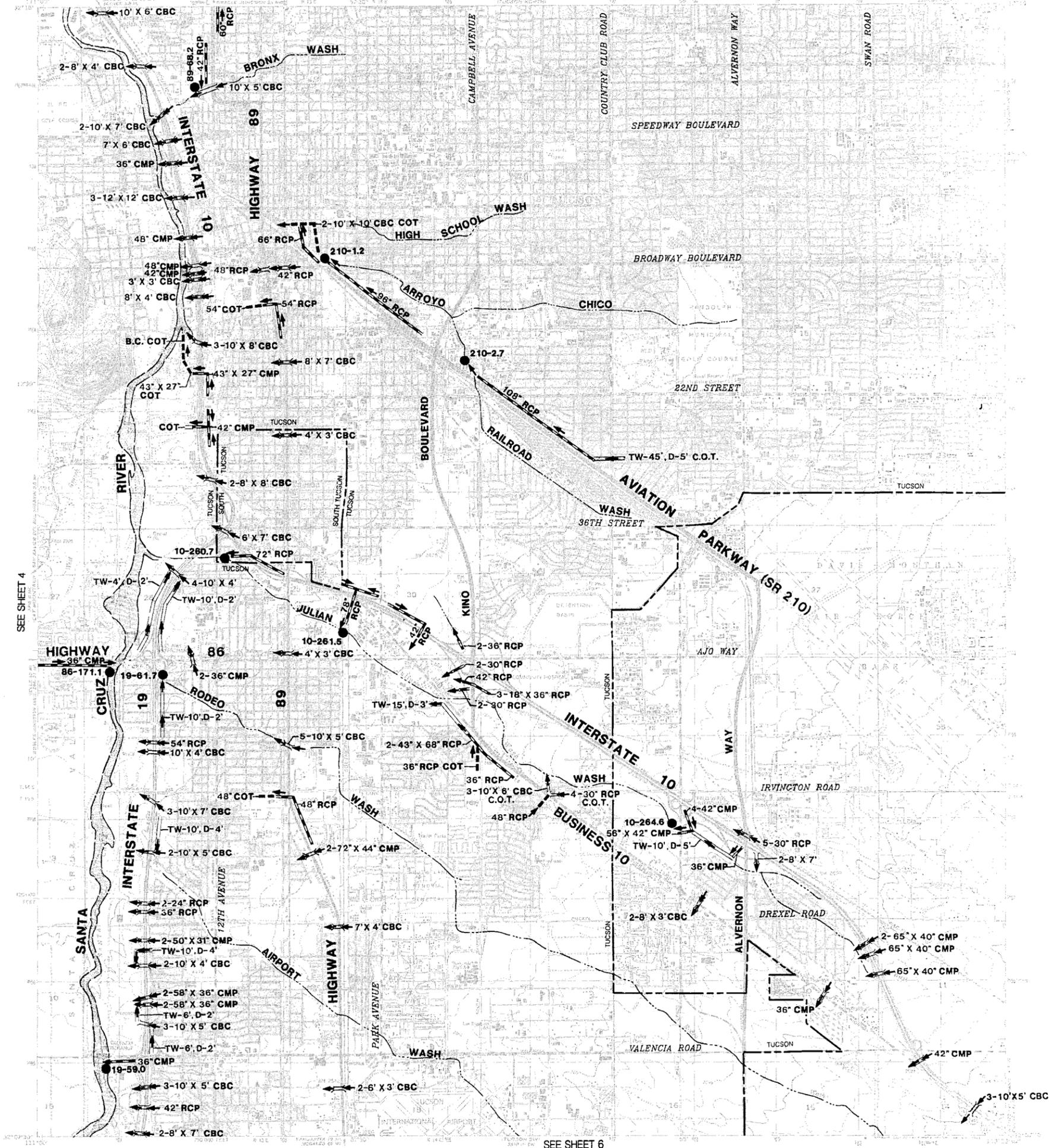
LEGEND

TW-48' D-8'	OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')	DETENTION BASIN
48"	ADOT STORM DRAIN PIPE (48" DIA.)	RETENTION BASIN
OTHER AGENCY STORM DRAIN PIPE	DRAINAGE TUNNEL	FLOODWAY BOUNDARY
15 CFS	PUMP STATION (15 CFS CAPACITY)	MUNICIPAL BOUNDARY
101-1.25	MAJOR OUTFALL WITH IDENTIFIER	CBC
DIRECTION OF FLOW		RCP
CROSS DRAINAGE STRUCTURE		CMP
DROP STRUCTURE		S.D.
		C.O.T.



NOVEMBER 1991

The WLB Group **WLB**



SEE SHEET 4

SEE SHEET 6

Map prepared and published by the Geological Survey
Contract by USGS and PDES/ADOT
Topographic data by photogrammetric methods from aerial
photography taken 1968. RCPs collected 1967
Revised map uses photogrammetry to 1967
Tucson file check 1981. Map revised 1982

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1000 National Center, Reston, Virginia 20192
For sale to the public through the National Center
1000 National Center, Reston, Virginia 20192
\$2.00 per copy plus shipping and handling charges
Red and orange areas in which only landmarks
or buildings are shown

There may be ground knowledge within the boundaries
of the National or State Plane coordinate systems on this map



ROAD CLASSIFICATION
Major Road
Medium Road
Improved Road

ROAD TYPE
Interstate Route
U.S. Route
State Route

TUCSON, ARIZ.
1982
7.5 MINUTE QUADRANGLE

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON

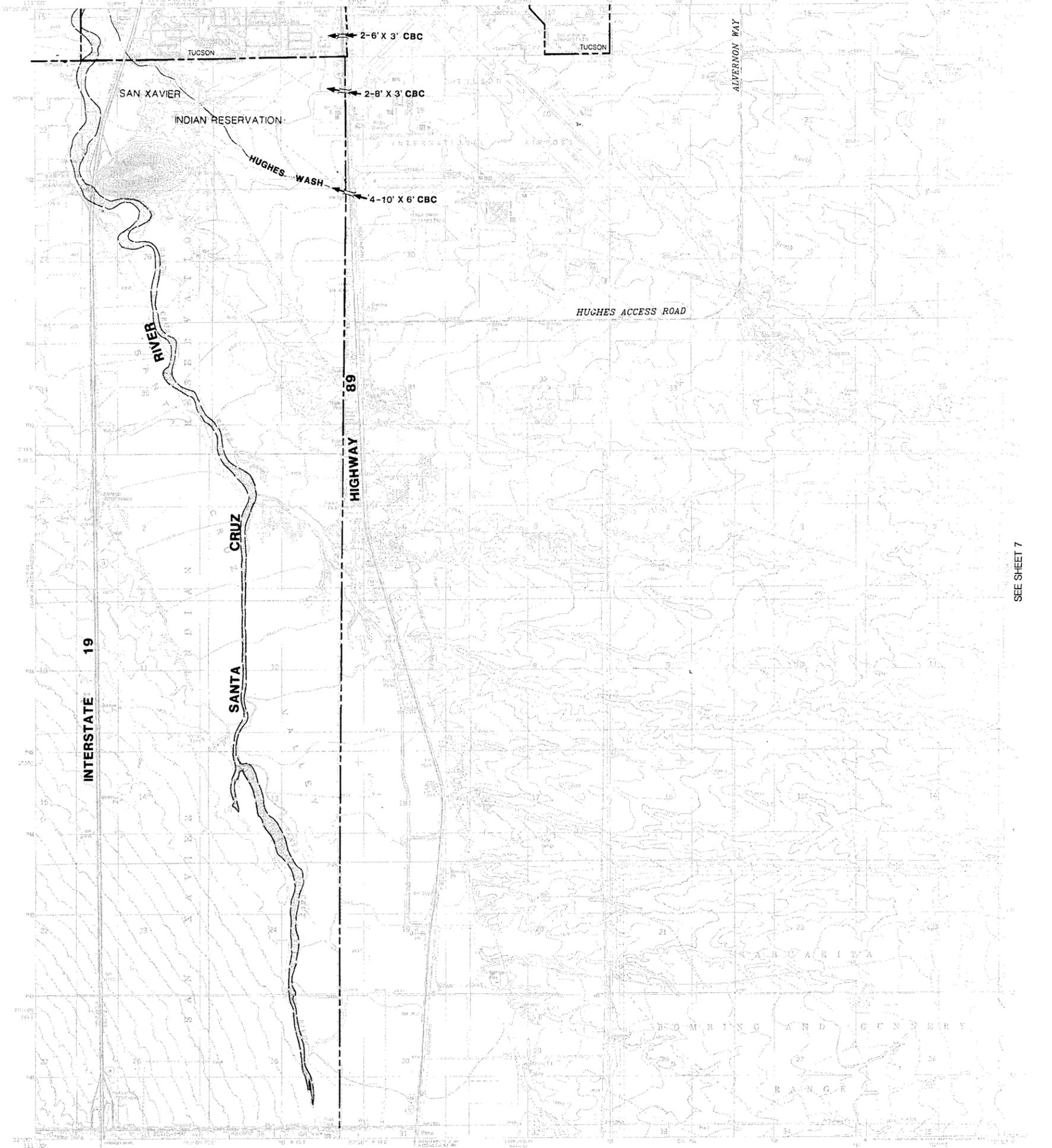


LEGEND

	OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')		DETENTION BASIN
	ADOT STORM DRAIN PIPE (48" DIA.)		RETENTION BASIN
	OTHER AGENCY STORM DRAIN PIPE		FLOODWAY BOUNDARY
	DRAINAGE TUNNEL		MUNICIPAL BOUNDARY
	PUMP STATION (15 CFS CAPACITY)		CONCRETE BOX CULVERT
	MAJOR OUTFALL WITH IDENTIFIER		REINFORCED CONCRETE PIPE
	DIRECTION OF FLOW		CORRUGATED METAL PIPE
	CROSS DRAINAGE STRUCTURE		STORM DRAIN
	DROP STRUCTURE		CITY OF TUCSON



NOVEMBER 1991



SEE SHEET 7

Map compiled, edited, and published by the Geological Survey
Compiled by USGS and AGS/ARIZONA
Topography by photogrammetry, 1:50,000 scale, first edition 1955
San Xavier Indian Reservation boundary from 1952
Elevation from 1981. Map dated 1985.
Projection and 10,000-foot grid from Arizona coordinate
system, central station (Tucson, Arizona).
1:50,000 scale (1 inch = 1.609 kilometers).
To locate this project, see Arizona Department of Transportation
map of the Tucson area, 2 inches scale, and
62 miles, enter the system by double arrow index
(and of mileages) in which only the
boundaries are shown.
There may be private easements within the boundaries
of the National or State Reservations shown on this map.

SCALE 1:25,000
CONTOUR INTERVAL, 10 FEET
NATIONAL GEODESIC DATUM OF 1983

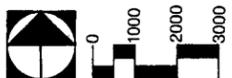
ROAD CLASSIFICATION
Primary
Secondary
Tertiary
Quaternary
Federal
State
County
Local
U.S. Route
State Route

THIS MAP COMPLETES THE NATIONAL MAP GEOLOGICAL REVISION
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80260. OFF FORTY-FIVE
A POWER TRANSMISSION TOWER AND SUPPORTS IS AVAILABLE ON REQUEST.

ARIZONA DEPARTMENT OF TRANSPORTATION DRAINAGE SYSTEM AND MAJOR OUTFALLS IN METROPOLITAN TUCSON



LEGEND	
	OPEN CHANNEL (TOP WIDTH 48', DEPTH 8')
	ADOT STORM DRAIN PIPE (48" DIA.)
	OTHER AGENCY STORM DRAIN PIPE
	DRAINAGE TUNNEL
	PUMP STATION (15 CFS CAPACITY)
	MAJOR OUTFALL WITH IDENTIFIER
	DIRECTION OF FLOW
	CROSS DRAINAGE STRUCTURE
	DROP STRUCTURE
	DETENTION BASIN
	RETENTION BASIN
	FLOODWAY BOUNDARY
	MUNICIPAL BOUNDARY
	CONCRETE BOX CULVERT
	REINFORCED CONCRETE PIPE
	CORRUGATED METAL PIPE
	STORM DRAIN
	CITY OF TUCSON



NOVEMBER 1991

The WLB Group

**Photographs of Field
Screening Locations
- Phoenix Area**



Outfall Identifier: 10-130.30

Description: I-10 Channel Outlet Into Agua Fria River 1/2 Mile West of El Mirage Road.

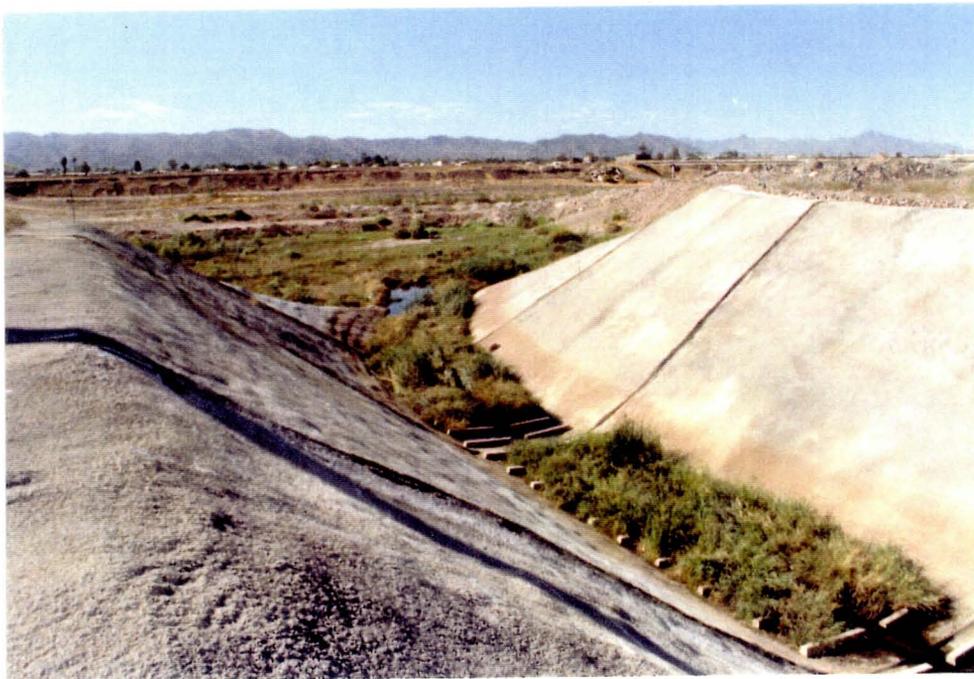
Photograph Orientation: Looking North Along the East Bank of the Agua Fria River (McDowell Road Bridge in Background)



Outfall Identifier: 10-145.17

Description: West Tunnel Outfall at West Side of Central Avenue and North Bank of Salt River

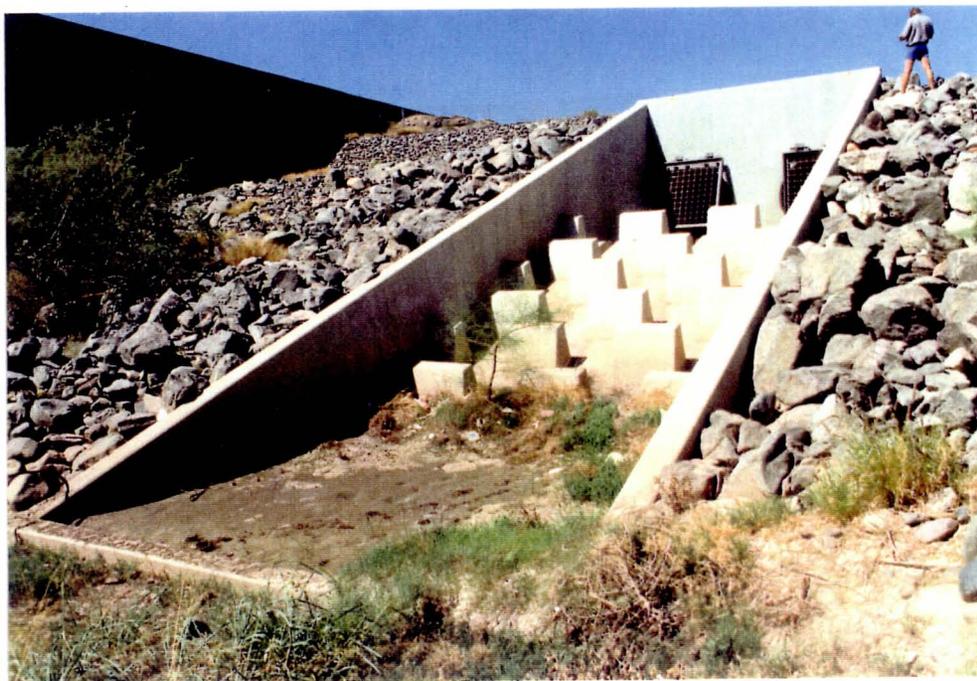
Photograph Orientation: Looking South from Outfall Structure into Salt River



Outfall Identifier: 10-149.18
Description: East Tunnel Outfall at East Side of 20th Street and North
Bank of Salt River
Photograph Orientation: Looking South along Concrete Lined Channel
Outfall into Salt River



Outfall Identifier: 10-150.44
Description: Outfall Structure for 36" RCP at North Bank of Salt River
and Southwest Side of I-10
Photograph Orientation: Looking Northwest from Bottom of Outfall Structure



Outfall Identifier: 10-150.45
Description: Outfall Structure for Dual 72" RCP at North Bank of Salt River and Northeast Side of I-10
Photograph Orientation: Looking West - Northwest at Dual 72" Outfall Structure from Bottom of Salt River



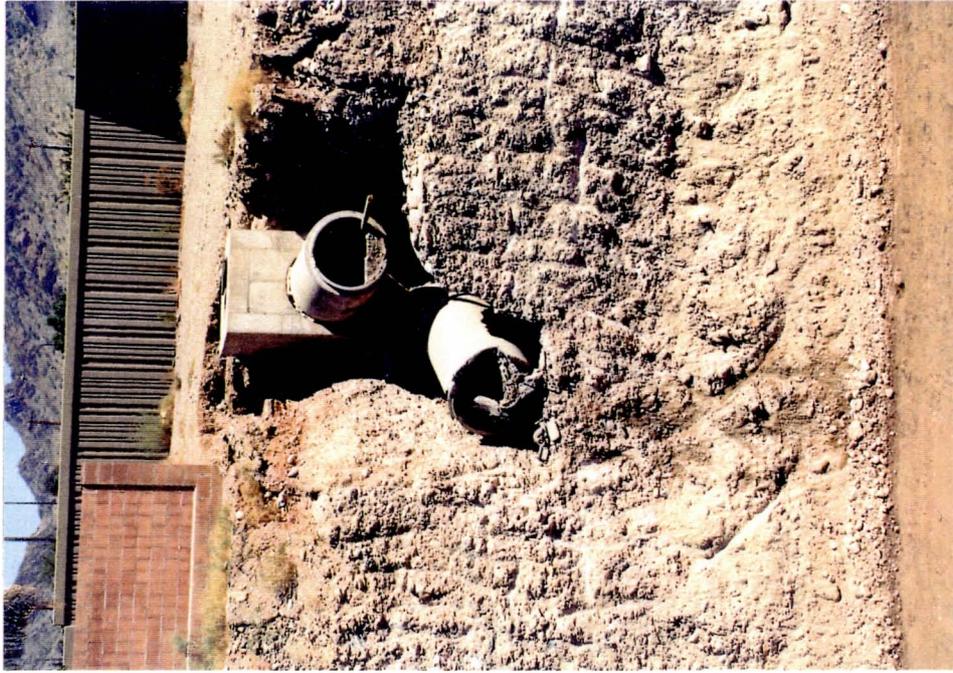
Outfall Identifier: 10-151.06
Description: 66" Pipe Outfall into Tempe Drain 660' West of I-10 and University Drive Traffic Interchange on North Side of I-10
Photograph Orientation: Looking South at 66" Pipe Outfall into Tempe Drain



Outfall Identifier: 17-198.48

Description: 102" RCP Outfall into the Salt River at about
24th Avenue

Photograph Orientation: Looking North from Salt River at
Outfall Structure



Outfall Identifier: 51-5.45
Description: 36" RCP (Upper) Outfall into ACDC
Photograph Orientation: Looking North - Northeast to 36" RCP (Upper Pipe)
Outfall Located in Northwest Quadrant at Squaw Peak Highway and
ACDC Crossing



Outfall Identifier: 51-7.04
Description: 48" RCP Outfall into Dreamy Draw Wash 400' South of Northern
Avenue at Northeast Quadrant of Dreamy Draw Wash and Squaw Peak
Highway Crossing
Photograph Orientation: Looking North Along East Side of Squaw Peak Highway
(Northern Avenue in Background)



Outfall Identifier: 101-7.76

Description: Open Channel Outfall into New River

Photograph Orientation: Looking East Along South Side of Open Channel
1/4 Mile South of Northern Ave. and 1/4 Mile West of 99th Avenue
(Box Culvert at 99th Avenue in Background)



Outfall Identifier: 101-10.84

Description: Open Channel Outfall into New River

Photograph Orientation: Looking East from End of Channel at Outfall into
New River 1/2 Mile North of Peoria Avenue and \pm 600' West of Loop
101 (In Background)



Outfall Identifier: 101-11.85

Description: Open Channel Outfall into New River

Photograph Orientation: Looking West from West Side of Southbound Loop 101
at Channel Outfall into New River 1/2 Mile South of Thunderbird Road



Outfall Identifier: 101-13.44

Description: Dual 42" RCP Outfall into Skunk Creek

Photograph Orientation: Looking East at Dual 42" RCP Outfall into Skunk
Creek 200' South of Southbound Loop 101 Bridge and \pm 250' West



Outfall Identifier: 101-13.68

Description: Open Channel Outfall into Skunk Creek

Photograph Orientation: Looking South at Channel Outfall into Skunk Creek
at 30' North of Northbound Loop 101 Bridge (at right) and 80' East
(South Bank of Skunk Creek in Background)



Outfall Identifier: 101-14.38

Description: Open Channel Outfall into New River

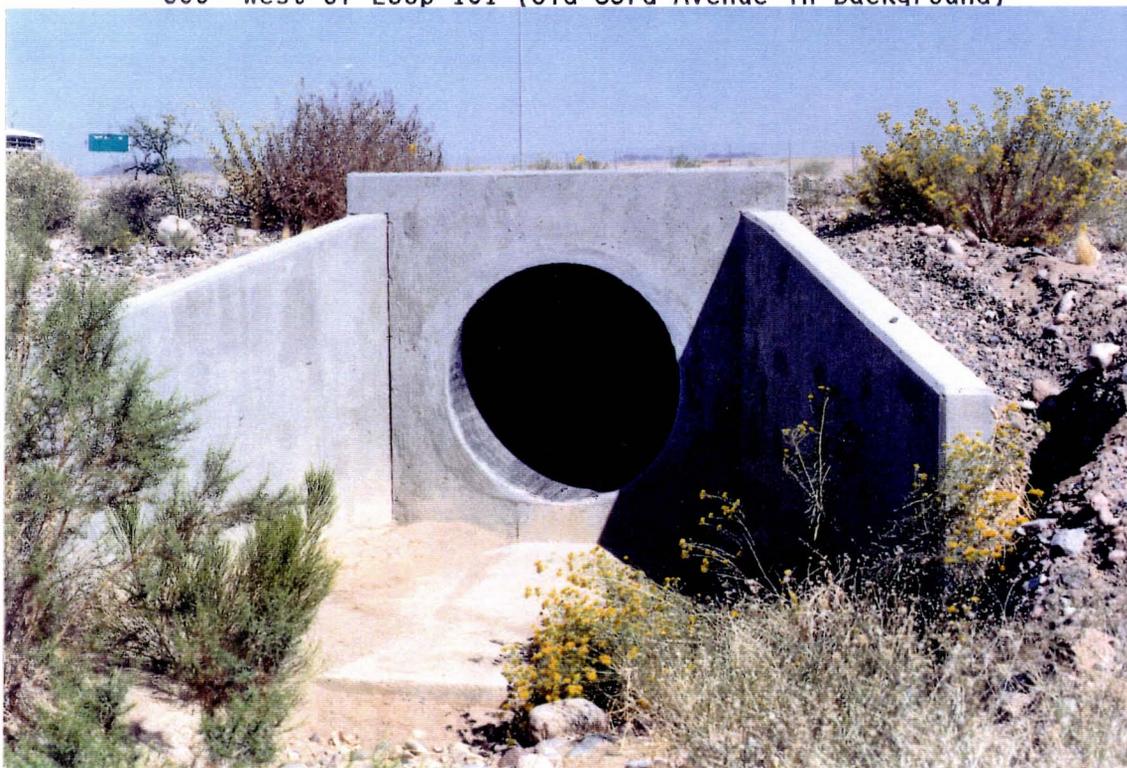
Photograph Orientation: Looking West at Channel Outfall into New River
1200' South of Loop 101 and Bell Road Traffic Interchange and 300' West



Outfall Identifier: 101-15.18

Description: 48" RCP Outfall into New River

Photograph Orientation: Looking East at 48" RCP Outfall into New River
4/10 Mile North of Bell Road and Loop 101 Traffic Interchange and
500' West of Loop 101 (Old 83rd Avenue in Background)



Outfall Identifier: 101-16.31

Description: 48" RCP Outfall into New River

Photograph Orientation: Looking East at 48th RCP Outfall into New River
at 4/10 Mile South of Beardsley Road and 300' West of Loop 101
(In Background)



Outfall Identifier: 101-16.62

Description: 48" RCP Outfall into New River

Photograph Orientation: Looking Southeast at 48" RCP Outfall into New River at 2/10 Mile South of Beardsley Road and 500' West of Loop 101



Outfall Identifier: 101-16.74

Description: Open Channel Outfall into New River

Photograph Orientation: Looking East from End of Open Channel at Outfall into New River 150' South of Beardsley Road and 2800' West of 75th Avenue



Outfall Identifier: 101-20.19
Description: 36" RCP Outfall into Skunk Creek
Photograph Orientation: Looking North at 36" RCP Outfall into Skunk Creek
at 51st Avenue 1/2 Mile South of Loop 101 Traffic Interchange



Outfall Identifier: 101-21.236
Description: 42" RCP Outfall into CBC Under North Frontage Road at
Skunk Creek Crossing
Photograph Orientation: Looking Southeast at 42" Outfall into CBC Under
Westbound Frontage Road 245' East of 43rd Avenue at Skunk Creek



Outfall Identifier: 101-21.239

Description: Open Channel Outfall into Skunk Creek

Photograph Orientation: Looking East from Open Channel Outfall into Skunk Creek along North Side of Westbound Frontage Road 260' East of 43rd Avenue
(Note 35th Avenue Traffic Interchange under construction in Background)



Outfall Identifier: 101-21.83

Description: 96" RCP Outfall into Scatter Wash

Photograph Orientation: Looking East Along South Side of Eastbound Frontage Road at 96" RCP Outfall into Scatter Wash 2000' West of 35th Avenue
(Note 35th Avenue Traffic Interchange Bridge Under Construction in Background)



Outfall Identifier: 101-21.869

Description: 36" RCP Outfall into Scatter Wash

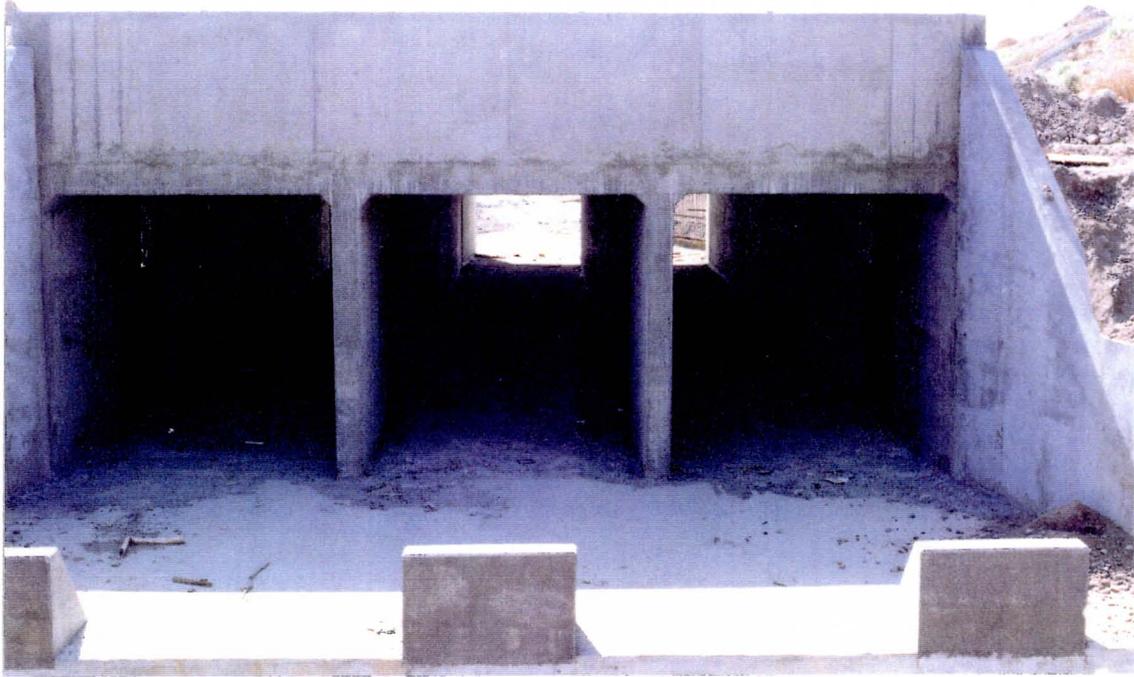
Photograph Orientation: Looking East at 36" RCP Outfall into Scatter Wash.
(Note Outfall is Part of CBC Under Westbound Frontage Road Over Scatter Wash) 1600' West of 35th Avenue



Outfall Identifier: 101-21.873

Description: Open Channel Outfall into Scatter Wash

Photograph Orientation: Looking East from Channel Outfall along North Side of Westbound Frontage Road 1500' West of 35th Avenue



Outfall Identifier: 101-51.58

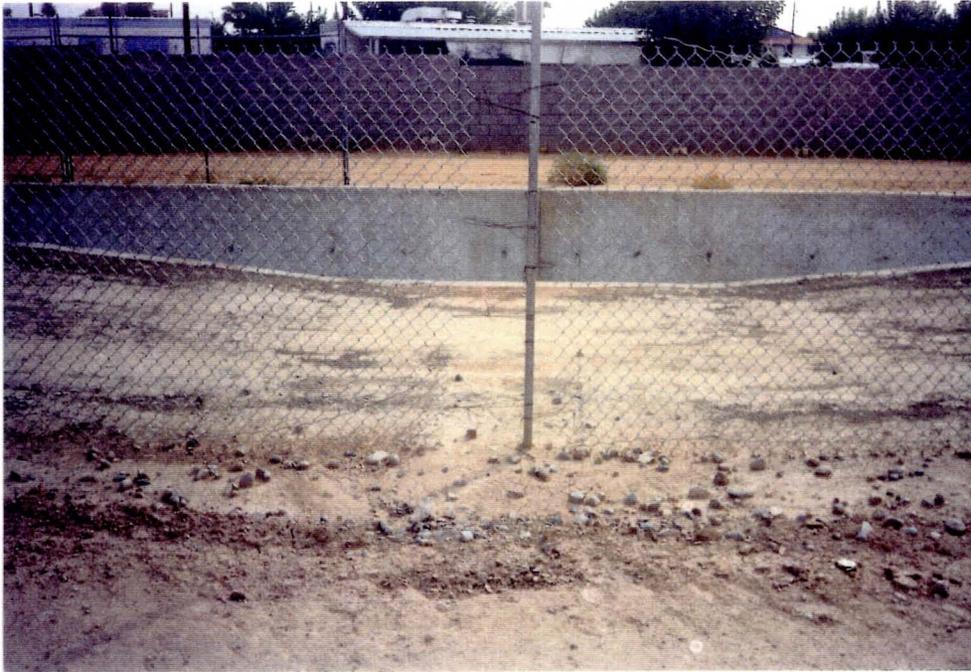
Description: 18' Wide Tunnel Outfall - Under Construction

Photograph Orientation: Looking South at Outfall into Salt River 1 Mile North of University and 200' East of Loop 101 (Note: CBC is Last Structure in series of 4 CBC and Interconnecting Channels which Compose Tunnel Outfall)



Outfall Identifier: 143-2.90

Description: 66" RCP Outfall into Relocated Old Cross Cut Canal
Photograph Orientation: Looking West at Outfall in West Wall of Canal
1800' South of Washington Street and 2500' West of Priest Drive



Outfall Identifier: 143-3.33

Description: Open Channel Outfall into Relocated Old Cross Cut Canal
Photograph Orientation: Looking East at Outfall into West Bank of Relocated
Old Cross Cut Canal 350' North of Loop 202 and Canal Crossing

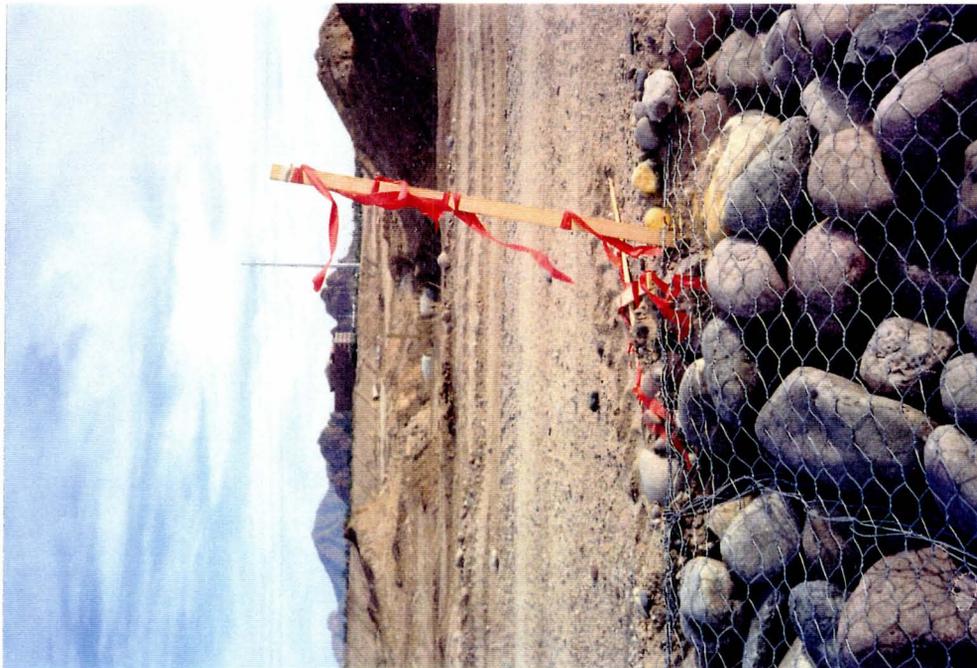


Outfall Identifier: 202-3.57

Description: Inlet Structure of CBC Connecting Into East Wall of
Relocated Old Cross Cut Canal
Photograph Orientation: Looking West at Inlet Structure of CBC in North
Quadrant of S.R. 143 - Loop 202 Traffic Interchange (Under Construction)



Outfall Identifier: 202-5.14
Description: Outfall of Open Channel (Via CBC) into Salt River
Photograph Orientation: Looking Northeast at Outfall of Open Channel into Salt River 1800' South of Washington Street and 2500' West of 56th Street (Under Construction)



Outfall Identifier: 202-5.90
Description: 36" RCP Outfall into Salt River
Photograph Orientation: Looking North at 36" RCP Outfall into Salt River 1000' East of Priest Drive and 2200' North of 1st Street (Under Construction)



Outfall Identifier: 202-7.44
Description: 48" RCP (Right) Outfall into Salt River
Photograph Orientation: Looking North at 48" (Right) RCP Outfall 1000' West
of Rural Road at North Bank of Salt River



Outfall Identifier: 202-7.98
Description: Open Channel Outfall (Via CBC) into Salt River
Photograph Orientation: Looking North at Channel Outfall 1000' East of
Rural Road at Bank of Salt River



Outfall Identifier: 360-15.42
Description: Open Channel Outfall into RWCD Floodway 1/2 Mile East of
Higley Road & S.R. 360 Traffic Interchange - North Side
Photograph Orientation: Looking Northeast at Interceptor Channel
Outfall into RWCD Floodway



Outfall Identifier: 360-17.63
Description: Open Channel Outfall into Sossaman Channel 1/4 Mile East of
Sossaman Road and S.R. 360 - South Side
Photograph Orientation: Looking South at Open Channel Outfall
into Sossaman Channel

**Photographs of Field
Screening Locations
- Tucson Area**



Outfall Identifier: 10-260.7
Description: 72" RCP Outfall into North Bank of Julian Wash at 10th Avenue
South of I-10
Photograph Orientation: Looking East at 72" RCP Outfall into Julian Wash



Outfall Identifier: 10-261.5
Description: 78" RCP Outfall into North Bank of Julian Wash 1400' West
of South Park Avenue and 1300' North of Ajo Way East of SPRR
Photograph Orientation: Looking North at 72" RCP Outfall into
Julian Wash



Outfall Identifier: 10-264.6

Description: 56" x 42" CMP Outfall into Julian Wash 1200' South of I-10 and Palo Verde Road Traffic Interchange - West Side of Palo Verde Road and North Bank of Julian Wash

Photograph Orientation: Looking North at Outfall of 56" x 42" CMP into Julian Wash



Outfall Identifier: 19-59.0

Description: 36" CMP Outfall into Santa Cruz River at 1200' West of I-19 and Valencia Road Traffic Interchange - South of Valencia Road at East Bank of Santa Cruz River

Photograph Orientation: Looking Southeast at 36" CMP Outfall into Santa Cruz River



Outfall Identifier: 19-61.7

Description: Open Channel Outfall into Rodeo Wash 900' South of I-19 and Ajo Way Traffic Interchange at East side of I-19 and South Bank of Rodeo Wash

Photograph Orientation: Looking Southwest at Open Channel Outfall into Rodeo Wash



Outfall Identifier: 86-171.1

Description: 36" CMP Outfall into Santa Cruz River at 1600' West of I-19 and Ajo Way Traffic Interchange - at West Bank of Santa Cruz River South of Ajo Way

Photograph Orientation: Looking West at 36" CMP Outfall into Santa Cruz River



Outfall Identifier: 89-68.2

Description: 42" RCP Outfall into Bronx Wash West of Oracle Road Between Adams Street and Lee Street

Photograph Orientation: Looking North at 42" RCP Outfall into Bronx Wash



Outfall Identifier: 89-71.8

Description: 72" CMP Outfall into Rillito River at South Bank of Rillito River and East Side of Oracle Road

Photograph Orientation: Looking West - Southwest at 72" CMP Outfall Into Rillito River



Outfall Identifier: 89-78.7

Description: Open Channel Outfall into Tributary of the Canada Del Oro at U.S. 89 and Greenrock Drive

Photograph Orientation: Looking Northerly at Outfall into Tributary (U.S.89 on Left)



Outfall Identifier: 89-78.9

Description: 42" RCP Outfall into Tributary of the Canada Del Oro Near Greenrock Drive and U.S. 89

Photograph Orientation: Looking Northerly from the Tributary at 42" Outfall



Outfall Identifier: 89-79.9
Description: Open Channel Outfall into Tributary of the Canada Del Oro
at U.S. 89 and Hanley Road
Photograph Orientation: Looking North - Northwest at Open Channel Outfall



Outfall Identifier: 89-80.8
Description: Open Channel Outfall at U.S. 89 and the Canada Del Oro
Photograph Orientation: Looking Southwesterly at Outfall Channel
Outlet into the Canada Del Oro



Outfall Identifier: 210-1.2
Description: 96" RCP Outfall into Arroyo Chico Southeast of 10th
Street and 3rd Avenue Intersection
Photograph Orientation: Looking Southeast at 96" RCP Outfall into
Arroyo Chico



Outfall Identifier: 210-2.7
Description: 108" RCP Outfall into Railroad Wash in Northwest Quadrant
at Intersection of Campbell Avenue and Aviation Parkway
Photograph Orientation: Looking Southeast at 108" RCP Outfall
into Railroad Wash