

**CITY OF MIDLAND, TEXAS  
MASTER DRAINAGE PLAN**

**SECTION 7  
SOUTH CHANNEL MASTER PLAN**

**7.1 GENERAL**

The South Channel watershed extends from its confluence with Midland Draw at County Road 110E westward to a point approximately one mile west of the intersection of Loop 250 with Business Loop 20 (U.S. Highway 80). Approximately one-half of the South Channel watershed is located within the detailed Geographic Information System (GIS) coverage and the detailed study area of this Master Drainage Plan. Figure 7-1 illustrates the area of the detailed study on the South Channel watershed and the position of a small portion of the South Channel relative to the City.

It is important to note that watershed subareas labeled SO15, SO16, SO17, SO18, and SO19, shown in the section maps, are actually part of the Midland Draw watershed. These subareas, however, are located south of Business Loop 20 and no improvements are planned within those subareas at this time. Also, little GIS coverage is available for those areas. Because of both a lack of proposed improvements and available GIS coverage, these subareas are included as part of the South Channel master plan discussion.

A large portion of the South Channel watershed is located outside the corporate limits of the City of Midland. At the time of publication of this master drainage plan, no significant development in the South Channel watershed was anticipated. Because of both a lack of detailed GIS coverage and lack of anticipated development pressures, only one lake improvement is recommended at this time. As the City grows and development pressures increase in the South Channel watershed, additional improvements may be required.

**7.2 HYDROGRAPHS**

A single hydrograph was plotted for the South Channel watershed for three hydrologic conditions: 1) existing land use hydrologic conditions, 2) future land use hydrologic conditions and assuming zero

stormwater runoff mitigation efforts and 3) future land use hydrologic conditions with all recommended drainage improvements installed.

The hydrograph plot shown in Figure 7-2 is for the South Channel immediately upstream of the Midland Draw confluence and illustrates the three conditions listed above. Note that the hydrographs for each condition have three distinct peaks. The hydrograph peaks occur at approximately 13 hours for the first peak, approximately 15 hours for the second peak, and after 20 hours for the third peak. The hydrograph location could not be illustrated on Figure 7-1 since the South Channel-Midland Draw confluence lies outside the map limits shown on Figure 7-1.

**7.3 LAND USE**

Two land use conditions were analyzed in the development of the Master Drainage Plan: existing conditions as of June 1993 and future conditions based on the City's Year 2020 Land Use Plan. The existing condition analysis provided a base line comparison for the effectiveness of various stormwater runoff mitigation measures.

**7.3.1 Existing Land Use**

As noted earlier in Section 1, the South Channel watershed consists of approximately 37 square miles of drainage area. Although a large portion of the South Channel watershed is located outside the City's GIS coverage, the complete area is considered urban and curve numbers were based on an average antecedent moisture condition (referred to as AMC II).

The South Channel watershed subareas and existing condition characteristics are listed in Table 7-1. The times of concentration listed with each subarea were determined using procedures contained in the City of Midland Storm Drainage Design Manual.

### 7.3.2 Future Land Use

Future land use conditions were based on the City of Midland's Comprehensive Plan and current zoning. The section maps for which GIS coverage was available for master planning are located in Figure 7-3 through Figure 7-15. These section maps show only the future land use condition. The future condition characteristics for the South Channel watershed subareas are listed in Table 7-1. Direct comparisons of the curve numbers and times of concentration in Table 7-1 show that a majority of the subareas are expected to experience land use changes resulting in an increase in curve number. The curve number increases expected as a result of future development range from 3 curve number units to 21 curve number units. The average increase is approximately 8 curve number units. Table 7-2 compares the existing and proposed peak flow rates for selected points along the main channel. Lake hydrology and hydraulic characteristics are summarized in Table 7-3.

## 7.4 CHANNEL AND ASSOCIATED ROADWAY DRAINAGE IMPROVEMENTS

Because of a lack of development pressure and a lack GIS coverage for the South Channel watershed, no improvements are planned for the South Channel at this time. However, it is recommended that improvements to the South Channel be considered if significant development of the South Channel watershed occurs or is anticipated.

## 7.5 MAN-MADE AND PLAYA LAKES

The South Channel watershed contains one man-made lake formed by a dam and several playa lakes. Man-made and playa lakes located within the South Channel watershed for which GIS coverage is available are shown in plan view on Figure 7-12 and Figure 7-13. The blue shading covering each lake location is the approximate surface area of the lake at the base flood elevation (BFE) listed with each lake. The playa lake shown in Figure 7-13 is not the lake designated as SO8 in Table 7-2 and Table 7-3. The lake designated as SO8 lies some distance south of IH-20 and GIS coverage is not available for that particular lake designation. Other information listed with each lake (Qex, Vex, etc.) is explained in the Legend Sheet of Figure 1-2 in Section 1 of this Master Drainage Plan. The tabulated information for each lake is repeated in Table 7-3 for

easy reference. Each lake carries the same designation as its subarea identification. Only the man-made lake, located in SO4, has planned improvements. Because of both a lack of development pressures and GIS coverage, no other playa lake improvements are planned at this time. The proposed improvements to the man-made lake in SO4 are listed in Table 7-4. A tabulated opinion of cost to make the proposed improvements is located in Table 7-5.

## 7.6 DETENTION BASINS

No regional detention basins are recommended for the South Channel watershed at this time. However, as GIS coverage becomes available and development pressures increase, suitable locations for regional detention basins may be determined.

## 7.7 ZERO MODIFICATION SUBAREAS

South Channel watershed subareas SO3, SO6, SO7, SO12, SO13, SO14, and SO15 are either already near completely developed with no significant area available for use in regional stormwater mitigation schemes, or their land use is not expected to significantly change from existing zoning. Therefore these subareas are considered to be "Zero Modification Subareas" in the current Master Drainage Plan.

END

**Table 7-1**

**South Channel Master Plan  
Watershed Subarea Characteristics**

SUBAREA I.D.	AREA (ACRES)	AREA (SQ. MI.)	EXISTING CONDITION JUNE 1993		FUTURE CONDITION YEAR 2020		NOTES
			CN	Tc HOURS	CN	Tc HOURS	
SO2	1,397.84	2.18	86	1.17	89	1.17	In detailed study area.
SO3	585.96	0.92	90	1.20	90	1.20	In detailed study area.
SO4	495.64	0.77	82	0.60	93	0.56	In detailed study area.
SO5	337.51	0.53	79	1.23	87	0.91	Outside of detailed study area.
SO6	1,056.12	1.65	73	1.19	73	1.19	Outside of detailed study area.
SO7	589.23	0.92	73	1.16	73	1.16	Outside of detailed study area.
SO8	3,595.11	5.62	81	3.61	85	2.89	In detailed study area.
SO9	1,881.62	2.94	73	2.62	78	2.62	In detailed study area.
SO10	1,890.03	2.95	70	1.53	74	1.53	Outside of detailed study area.
SO11	2,180.66	3.41	79	3.94	90	2.58	In detailed study area.
SO12	1,154.71	1.80	75	0.77	75	0.77	In detailed study area.
SO13	142.99	0.22	73	0.35	73	0.35	Outside of detailed study area.
SO14	105.98	0.17	69	1.07	69	1.07	Outside of detailed study area.
SO15	770.41	1.20	73	0.98	73	0.98	Outside of detailed study area.
SO16	71.54	0.11	73	0.43	81	0.43	Outside of detailed study area.
SO17	754.09	1.18	74	0.94	77	0.94	In detailed study area.
SO18	1,330.36	2.08	69	2.04	76	2.04	In detailed study area.
SO19	1,082.83	1.69	67	3.67	78	3.67	In detailed study area.

**Table 7-2**

**Channel Subarea Hydrologic Characteristics  
Based on 100-Year 24-Hour Event**

SUBAREA I.D.	DESIGNATED LOCATION	EXISTING DISCHARGE		FUTURE DISCHARGE	
		Peak (cfs)	Peak Time (hrs)	Peak (cfs)	Peak Time (hrs)
SO4	Outflow from man-made Lake in SO4 at upstream end of South Channel.	3,310	13.50	3,143	13.50
SO8	Outflow from playa lake that lies astride State Highway 349.	5,660	15.50	4,503	16.75
SO9	Outflow from playa lake east of State Highway 349.	3,626	18.25	2,676	20.25
SO12	Prior to Confluence with Midland Draw.	3,885	20.50	3,947	15.00

**TABLE 7-3**

**Playa Lake Hydrologic and Hydraulic Characteristics  
Based on 100-Year 24-Hour Event**

SUBAREA I.D.	EXISTING INFLOW		FUTURE INFLOW		LAKE ELEVATION-VOLUME			OVERFLOW CHARACTERISTICS			
	Peak (cfs)	Volume (Ac. Ft.)	Peak (cfs)	Volume (Ac. Ft.)	Base Flood Elevation (msl)	Existing Lake* Volume (Ac. Ft.)	Future Lake Volume (Ac. Ft.)	Existing Overflow Volume (Ac. Ft.)	Future Overflow Volume (Ac. Ft.)	Existing Overflow Peak (cfs)	Future Overflow Peak (cfs)
S04**	5,827	1,078.3	6,098	1,170.0	2811.0	416.9	508.5	1,078.3	1,169.9	3,310	3,143
SO8	Data to be determined as detailed GIS coverage becomes available.										
SO9	Data to be determined as detailed GIS coverage becomes available.										

\* Estimated from City's 2-foot GIS contours.

\*\* Man-made lake. The principal spillway elevation is such that all runoff entering the lake is eventually discharged.

**TABLE 7-4**

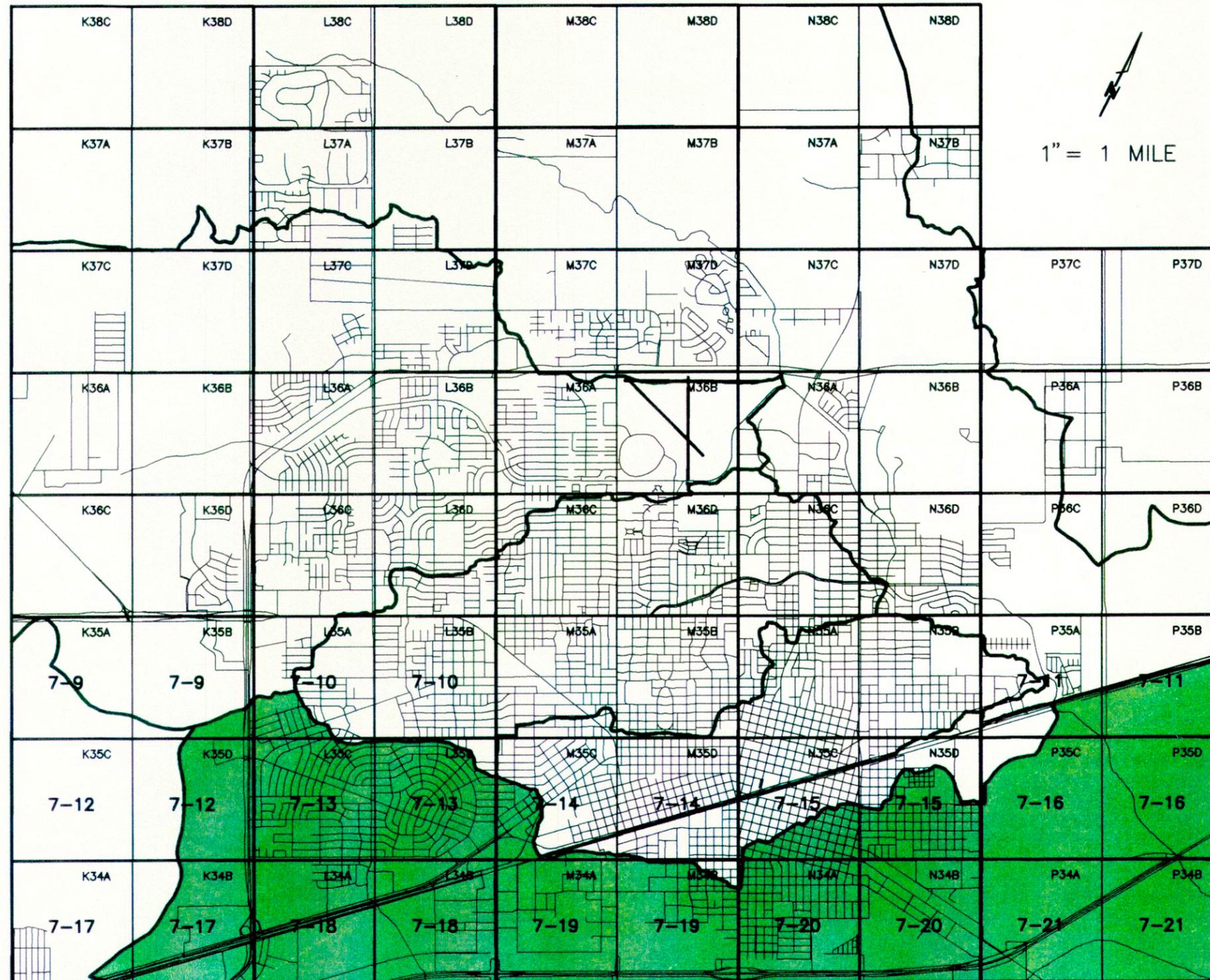
**Playa Lake Planned Improvements Summary**

SUBAREA I.D.	FIGURE NUMBER	LAKE CREST ELEVATION (msl)	REQUIRED EXCAVATION BELOW CREST ELEVATION (CY)	DRAWDOWN STORM DRAIN	OVERFLOW PATH	PRELIMINARY BUDGET OPINION OF COST TABLE NUMBER	OPINION OF COST (TOTALS)
SO4	7-12	2803.0	147,800	None Planned	To South Channel	7-5	\$686,320
SO8*	None	2754.2 (West of 349) 2751.5 (East of 349)	None Planned	None Planned	To SO9	None	None
SO9*	None	2745.8	None Planned	None Planned	To South Channel	None	None

\* SO8 and SO9 are playa lakes within the South Channel alignment.

**TABLE 7-5**  
**SOUTH CHANNEL**  
**PRELIMINARY BUDGET OPINION OF COST**  
**CITY OF MIDLAND, TEXAS**  
**LAKE SO4 IMPROVEMENTS**

ITEM	UNIT	UNIT PRICE	QUANTITY	TOTAL
1 PLAYA EXCAVATION	C.Y.	\$4.00	147,800	\$591,200
2 CONSTRUCTION CONTINGENCIES	L.S.	10%	1	\$59,120
3 ENGINEERING				\$12,000
4 SURVEYING, TESTING & RPR				\$24,000
<b>TOTAL FOR LAKE SO4 IMPROVEMENTS</b>				<b>\$686,320</b>

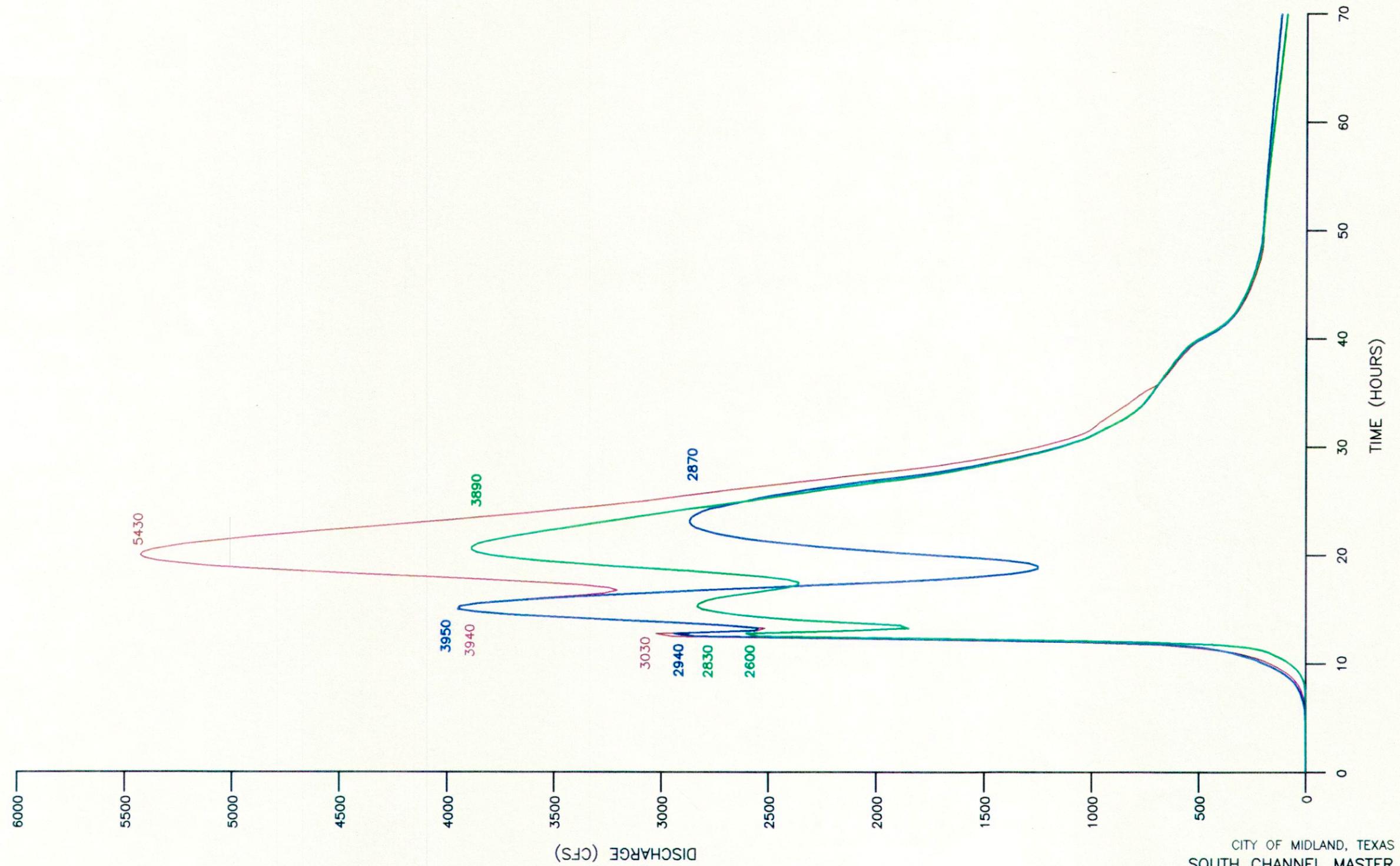


SOUTH CHANNEL WATERSHED, INDEX TO SECTION MAPS

FIGURE 7-1

CITY OF MIDLAND, TEXAS  
 SOUTH CHANNEL MASTER PLAN  
 WATERSHED MAP INDEX

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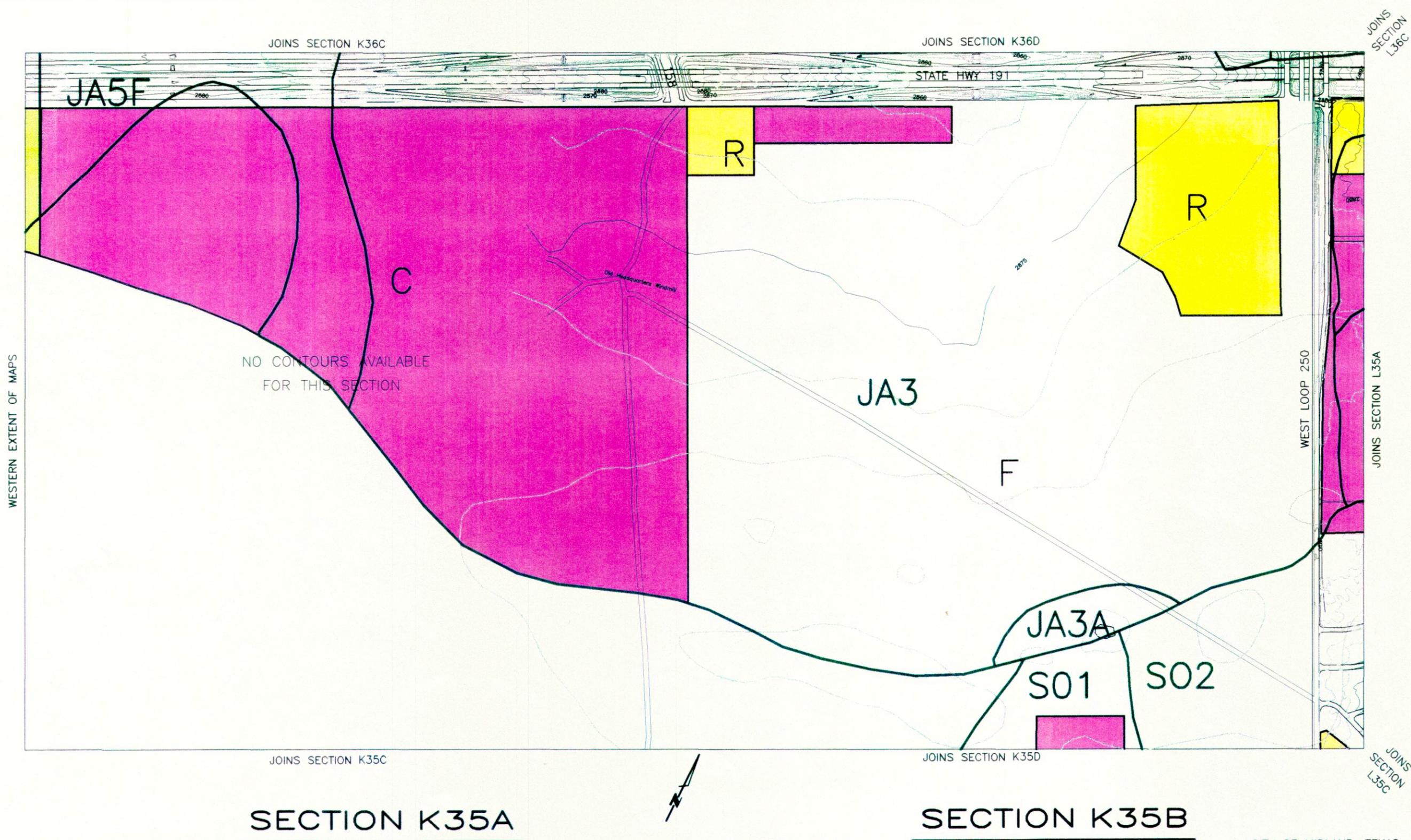


SOUTH CHANNEL PRIOR TO CONFLUENCE WITH MIDLAND DRAW

**LEGEND**

- 100-YEAR EXISTING, JUNE 1993 CONDITIONS —
- 100-YEAR FUTURE, YEAR 2020 NO MODIFICATIONS —
- 100-YEAR FUTURE, YEAR 2020 WITH MODIFICATIONS —

FIGURE 7-2



**SECTION K35A**

**SECTION K35B**



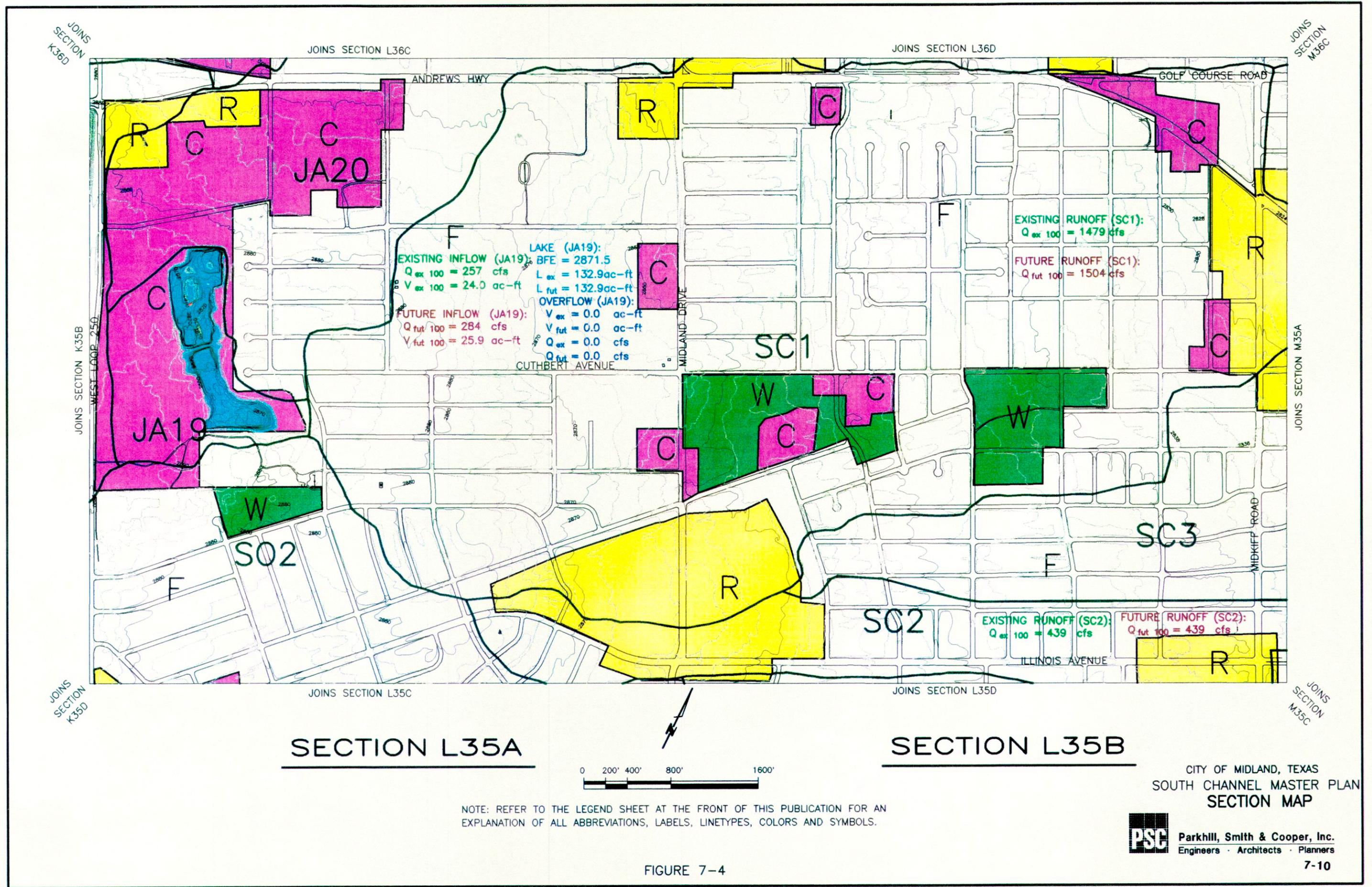
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CITY OF MIDLAND, TEXAS  
SOUTH CHANNEL MASTER PLAN  
SECTION MAP

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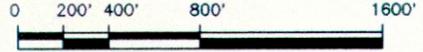
FIGURE 7-3

K35AB 4/4/96 RSK



SECTION L35A

SECTION L35B



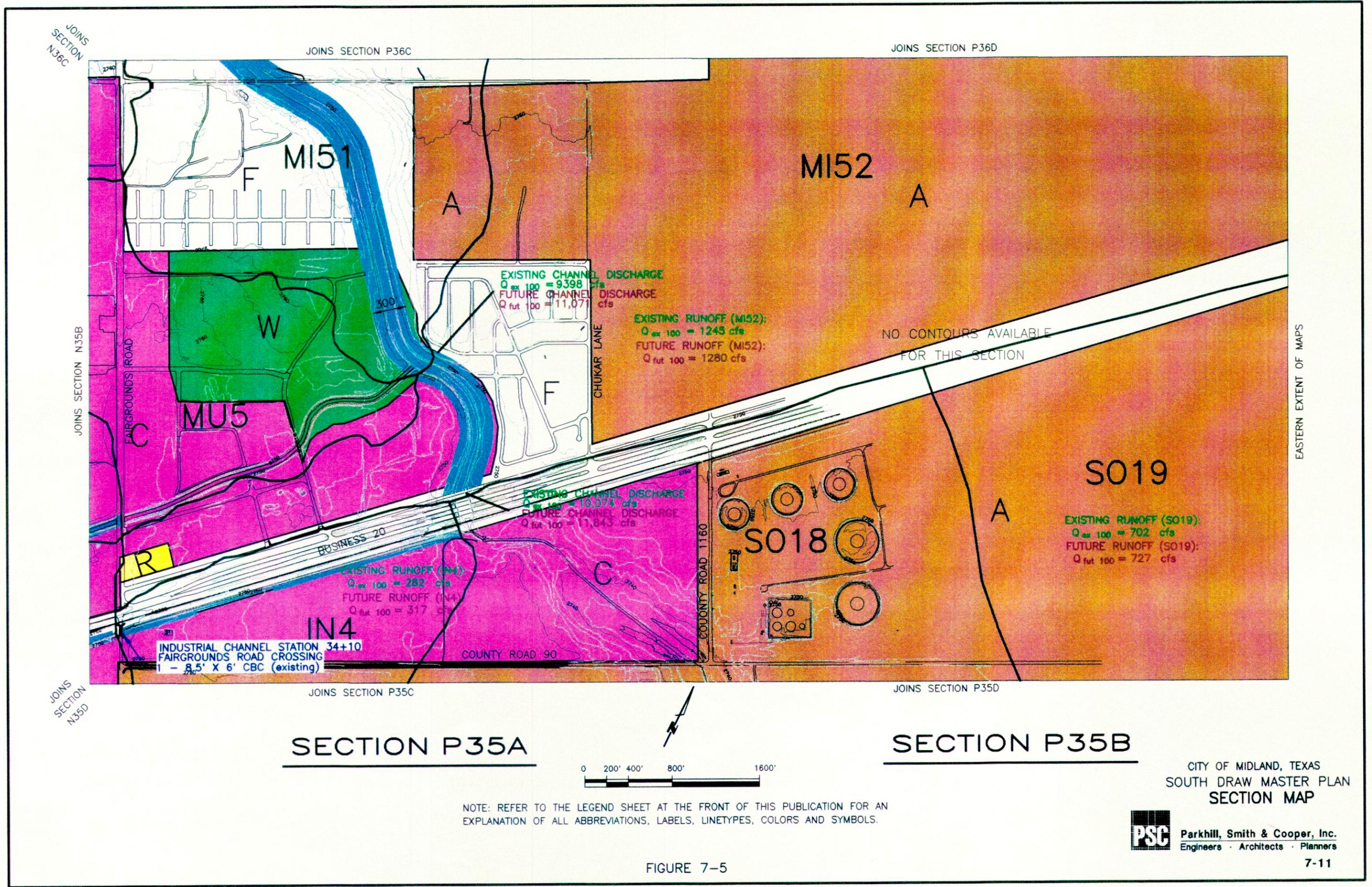
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CITY OF MIDLAND, TEXAS  
SOUTH CHANNEL MASTER PLAN  
SECTION MAP

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FIGURE 7-4

L35AB 3/21/96 RSK



JOINS SECTION N36C

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JOINS SECTION P36D

JOINS SECTION N35B

EASTERN EXTENT OF MAPS

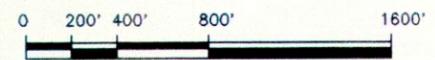
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JOINS SECTION P35C

JOINS SECTION P35D

SECTION P35A

SECTION P35B



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CITY OF MIDLAND, TEXAS  
SOUTH DRAW MASTER PLAN  
SECTION MAP

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FIGURE 7-5

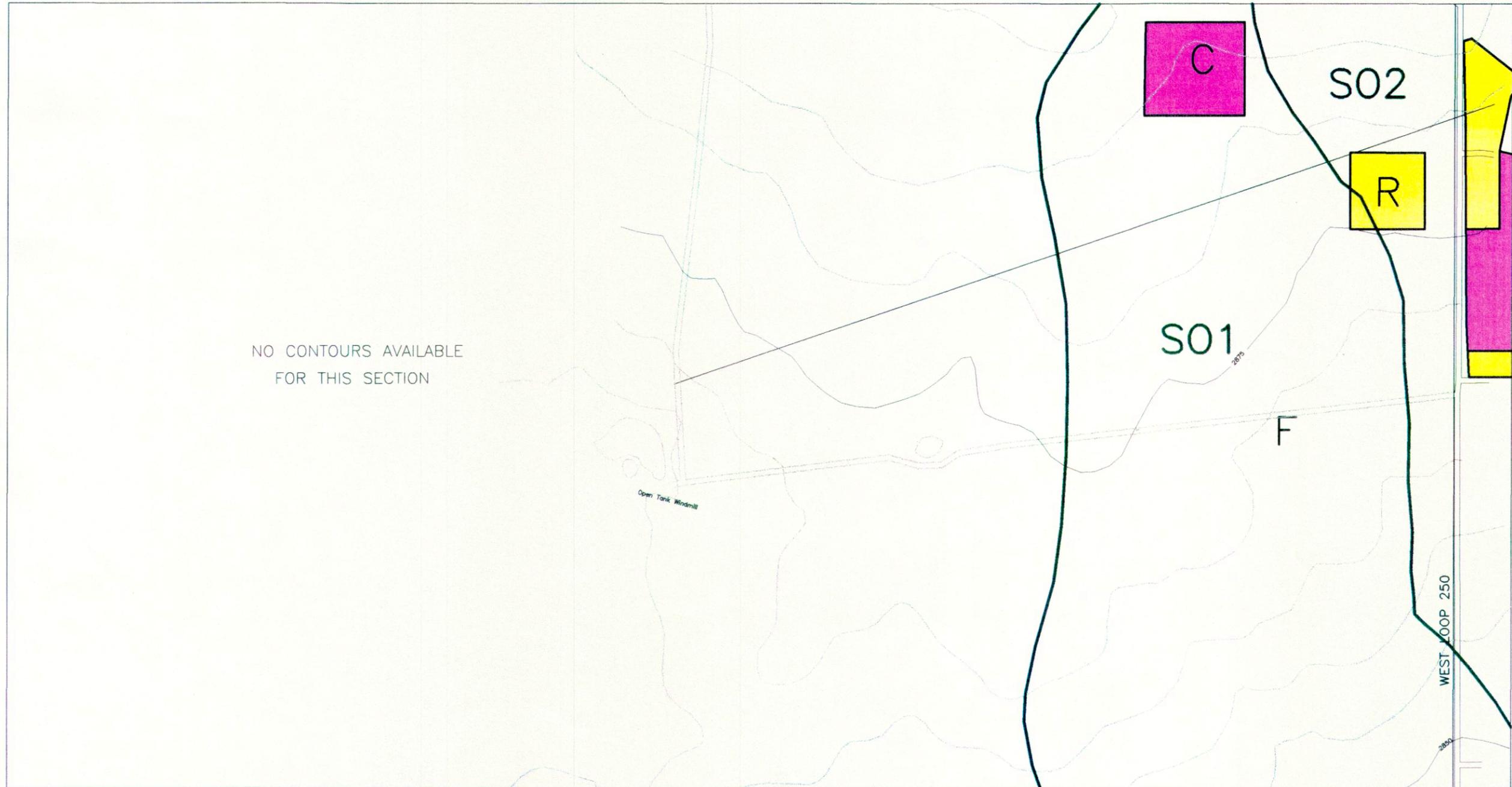
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WESTERN EXTENT OF MAPS

JOINS SECTION K35A

JOINS SECTION K35B

JOINS SECTION L35A



NO CONTOURS AVAILABLE FOR THIS SECTION

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JOINS SECTION L34A

**SECTION K35C**

**SECTION K35D**



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CITY OF MIDLAND, TEXAS  
SOUTH CHANNEL MASTER PLAN  
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FIGURE 7-6

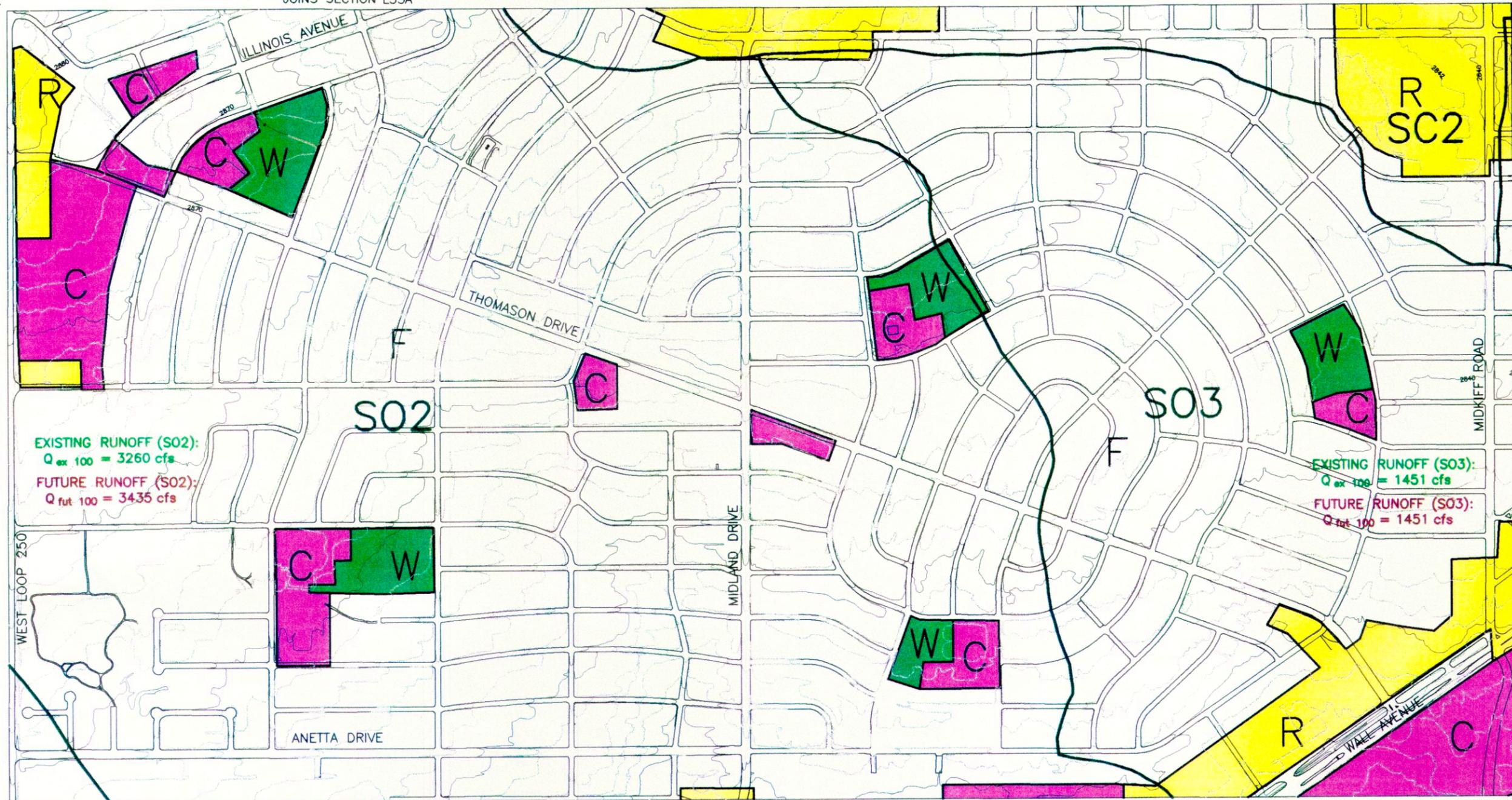
K35CD 3/21/10 RSK

JOINS SECTION K35B

JOINS SECTION L35A

JOINS SECTION L35B

JOINS SECTION M35A



JOINS SECTION K35D

JOINS SECTION M35C

JOINS SECTION K34B

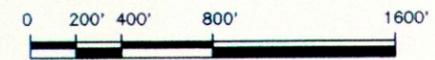
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JOINS SECTION M34A

**SECTION L35C**

**SECTION L35D**



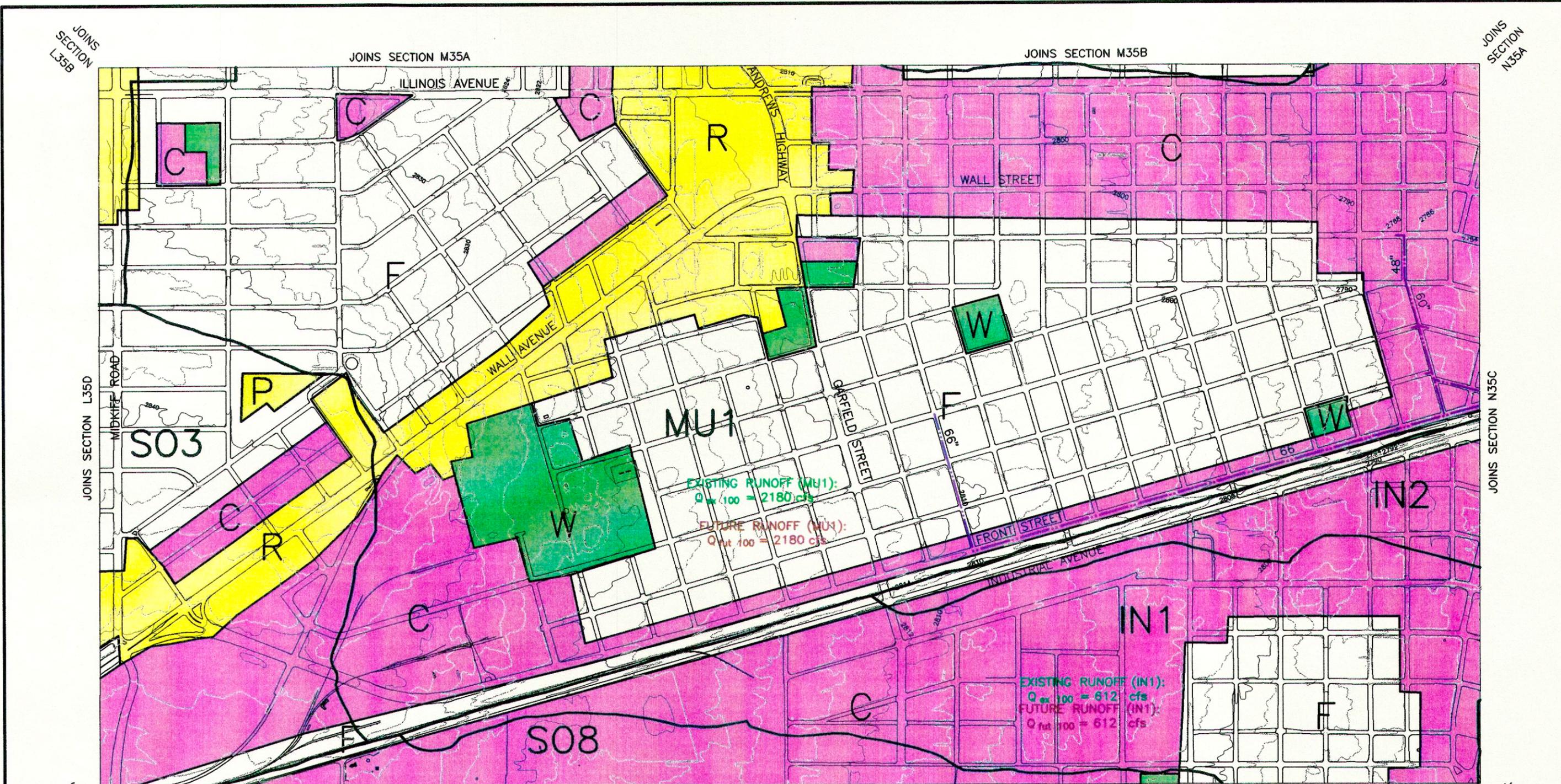
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SOUTH CHANNEL MASTER PLAN  
SECTION MAP

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FIGURE 7-7

K35CD 3/21/98 RSK

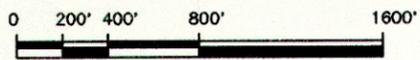


EXISTING RUNOFF (MU1):  
 $Q_{ex 100} = 2180 \text{ cfs}$   
 FUTURE RUNOFF (MU1):  
 $Q_{fut 100} = 2180 \text{ cfs}$

EXISTING RUNOFF (IN1):  
 $Q_{ex 100} = 612 \text{ cfs}$   
 FUTURE RUNOFF (IN1):  
 $Q_{fut 100} = 612 \text{ cfs}$

SECTION M35C

SECTION M35D



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CITY OF MIDLAND, TEXAS  
 SOUTH CHANNEL MASTER PLAN  
 SECTION MAP

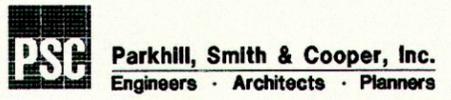
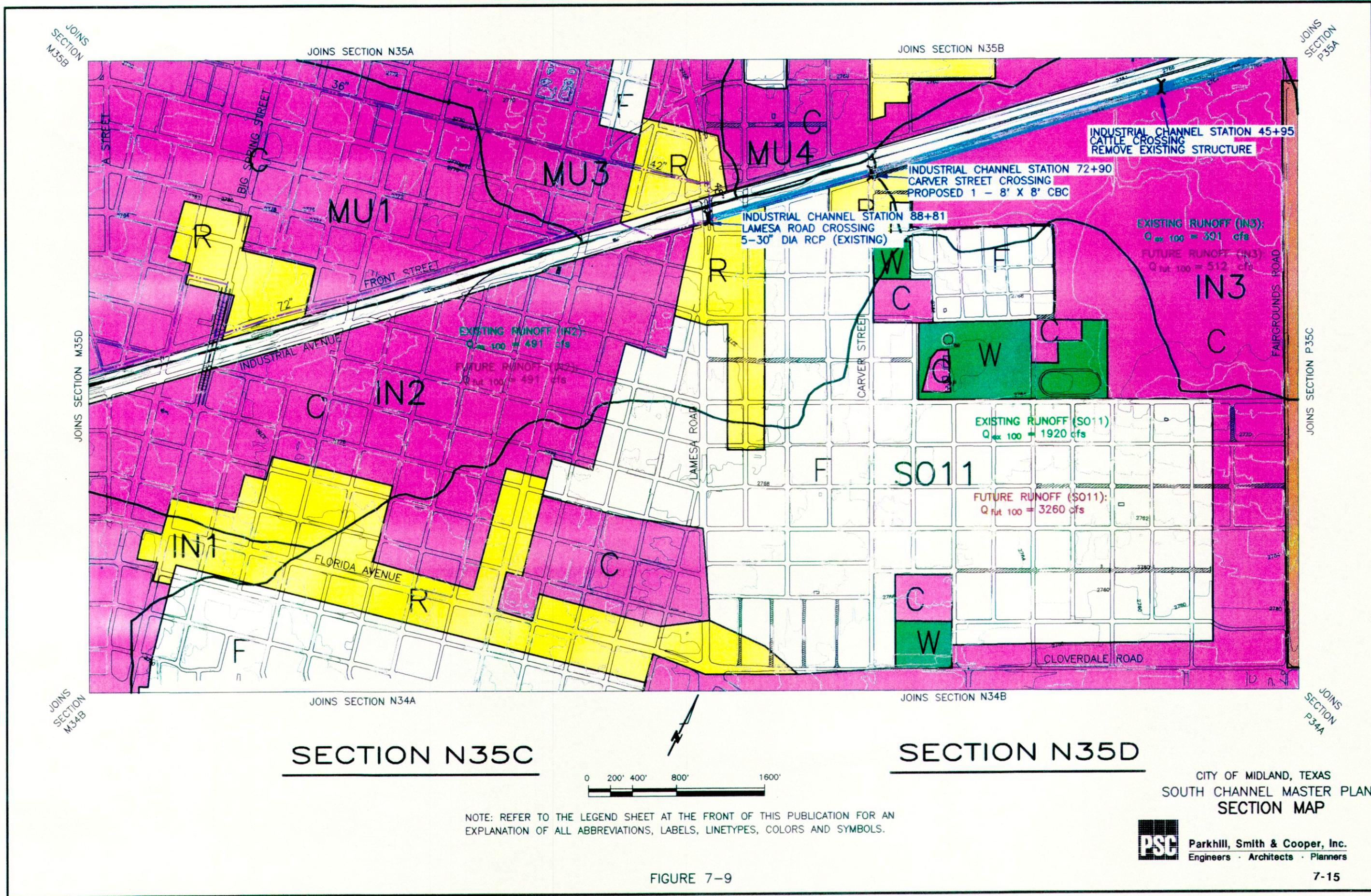


FIGURE 7-8

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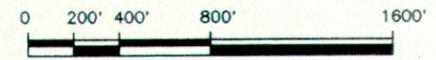
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SECTION N35C

SECTION N35D

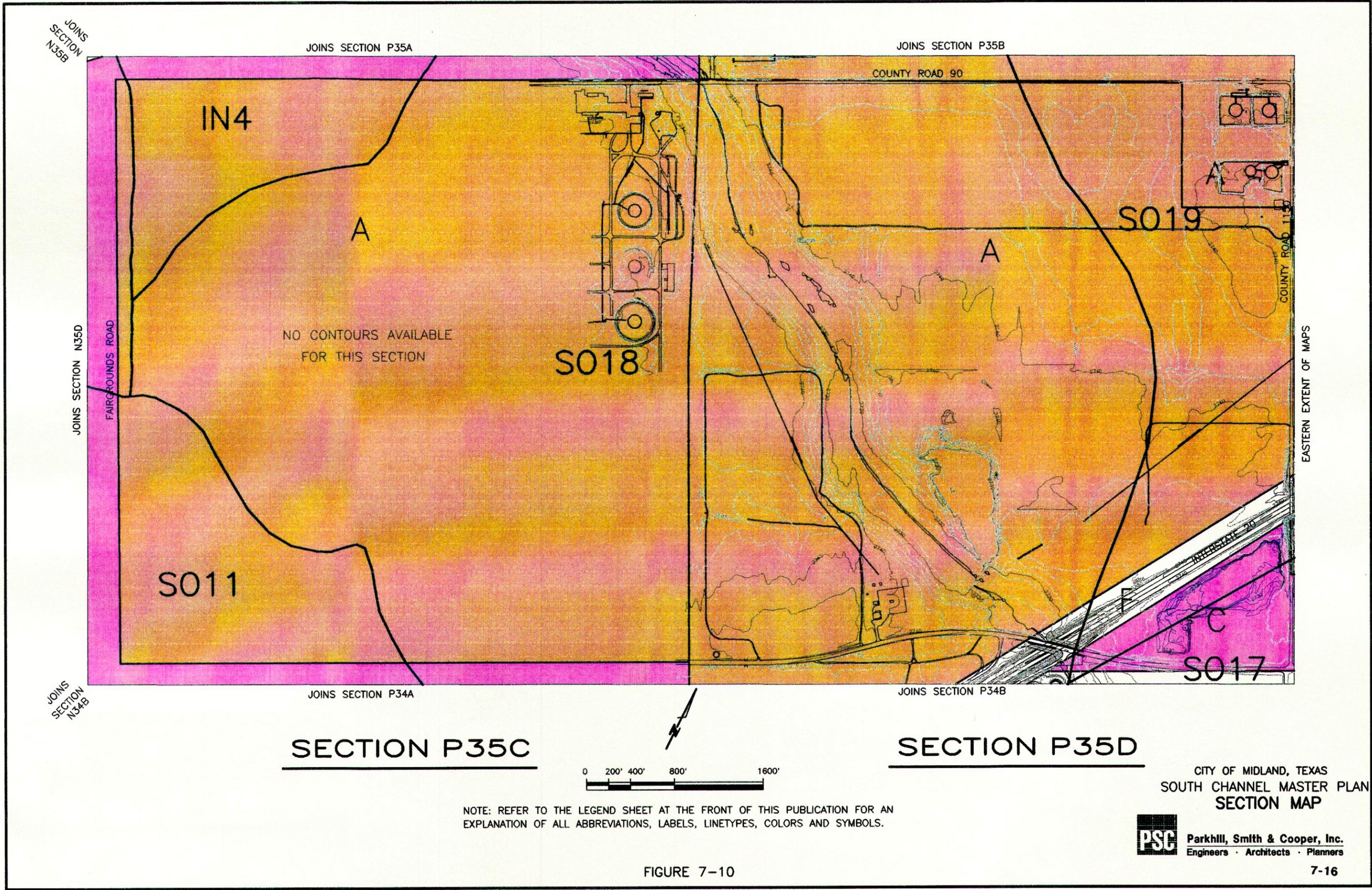


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CITY OF MIDLAND, TEXAS  
SOUTH CHANNEL MASTER PLAN  
SECTION MAP

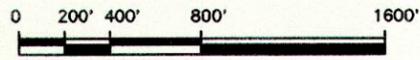
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FIGURE 7-9



**SECTION P35C**

**SECTION P35D**



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CITY OF MIDLAND, TEXAS  
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FIGURE 7-10

P35CD 3/22/95 30 RSK

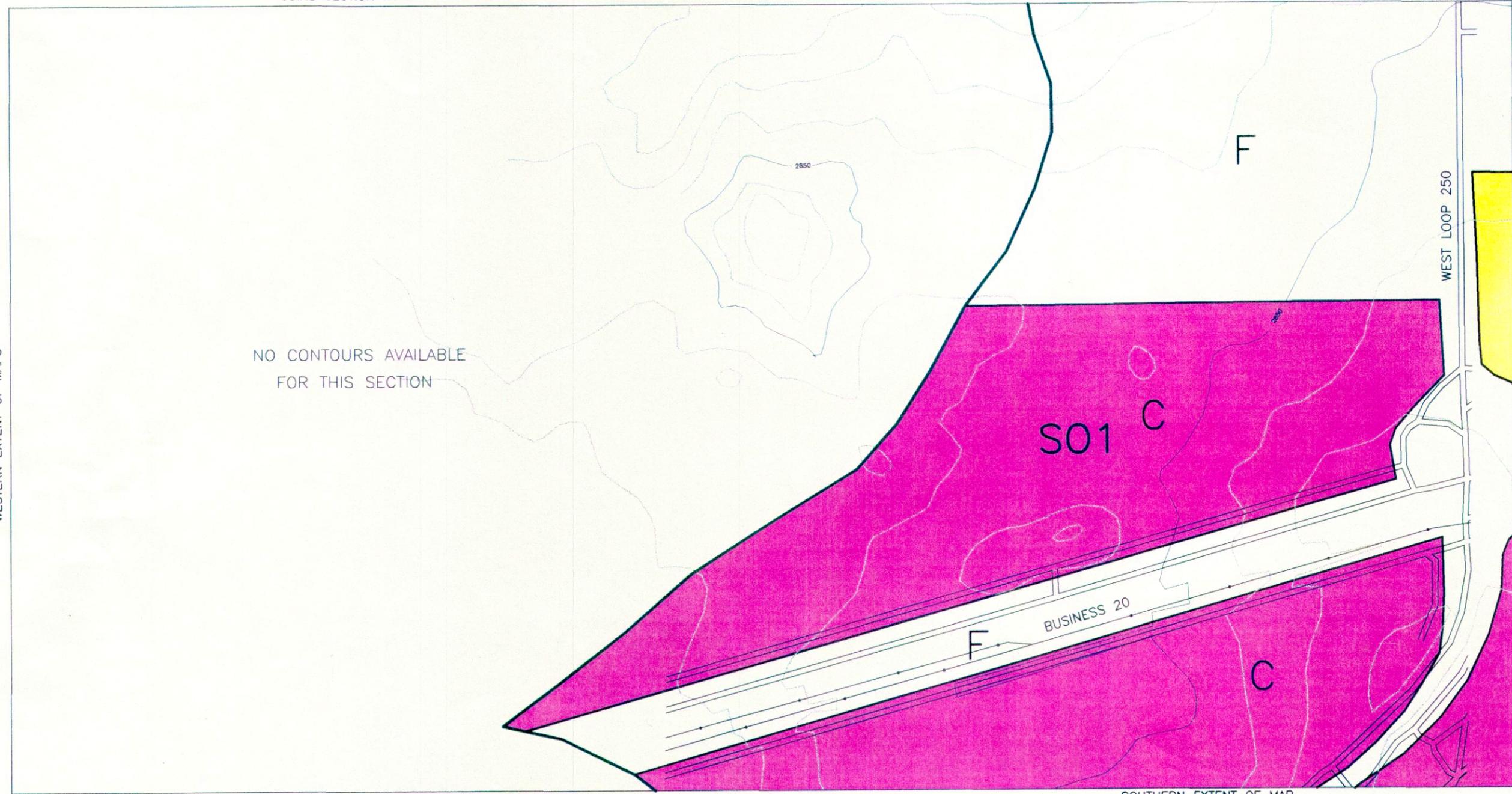
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JOINS SECTION K35C

JOINS SECTION K35D

WESTERN EXTENT OF MAPS

NO CONTOURS AVAILABLE FOR THIS SECTION

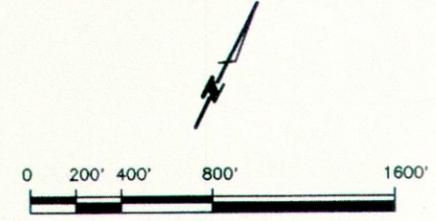


SOUTHERN EXTENT OF MAP

SOUTHERN EXTENT OF MAP

SECTION K34A

SECTION K34B



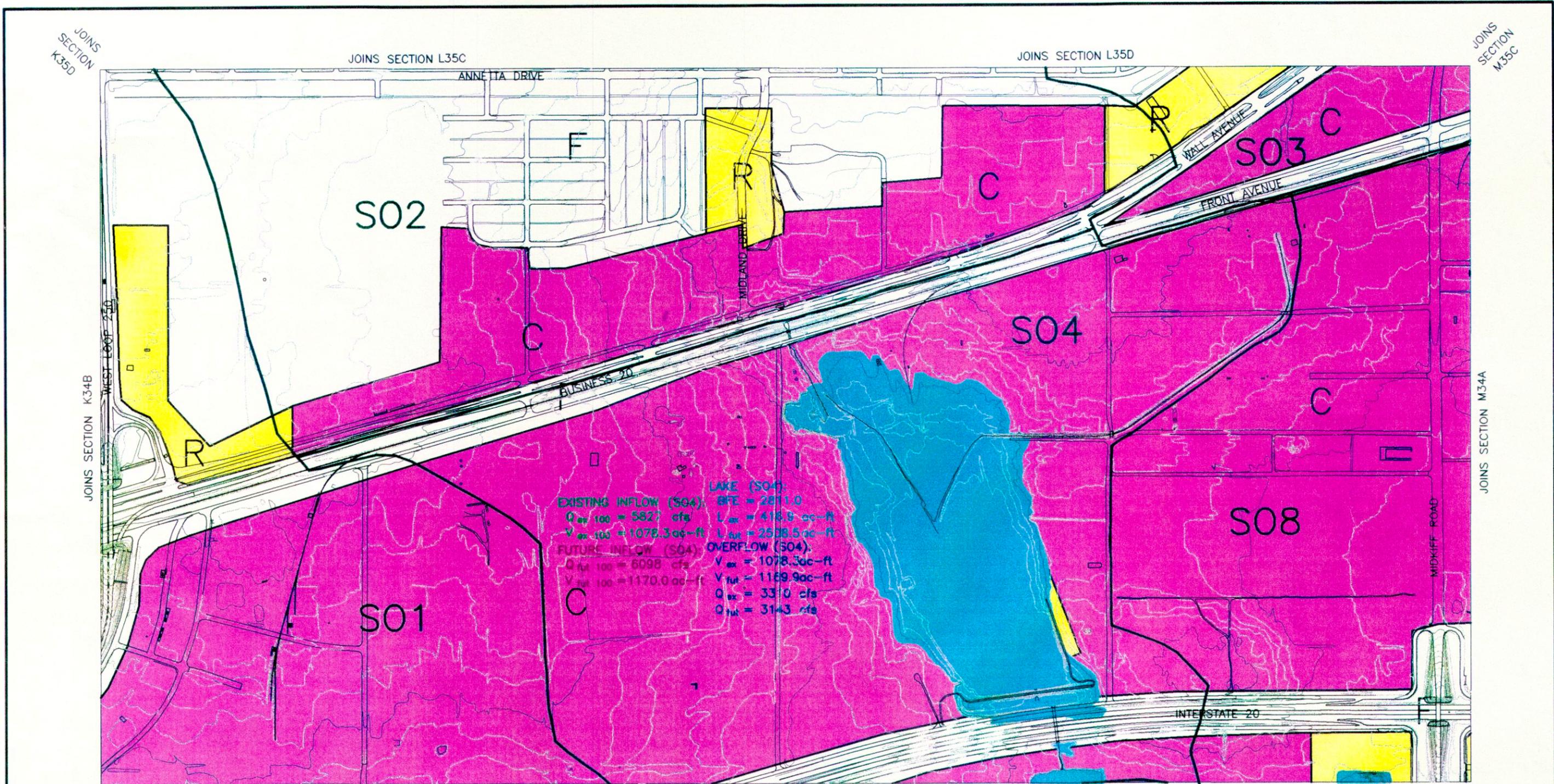
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CITY OF MIDLAND, TEXAS  
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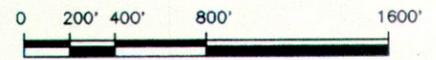
FIGURE 7-11

K34AB 3/21/96 RSK



SECTION L34A

SECTION L34B



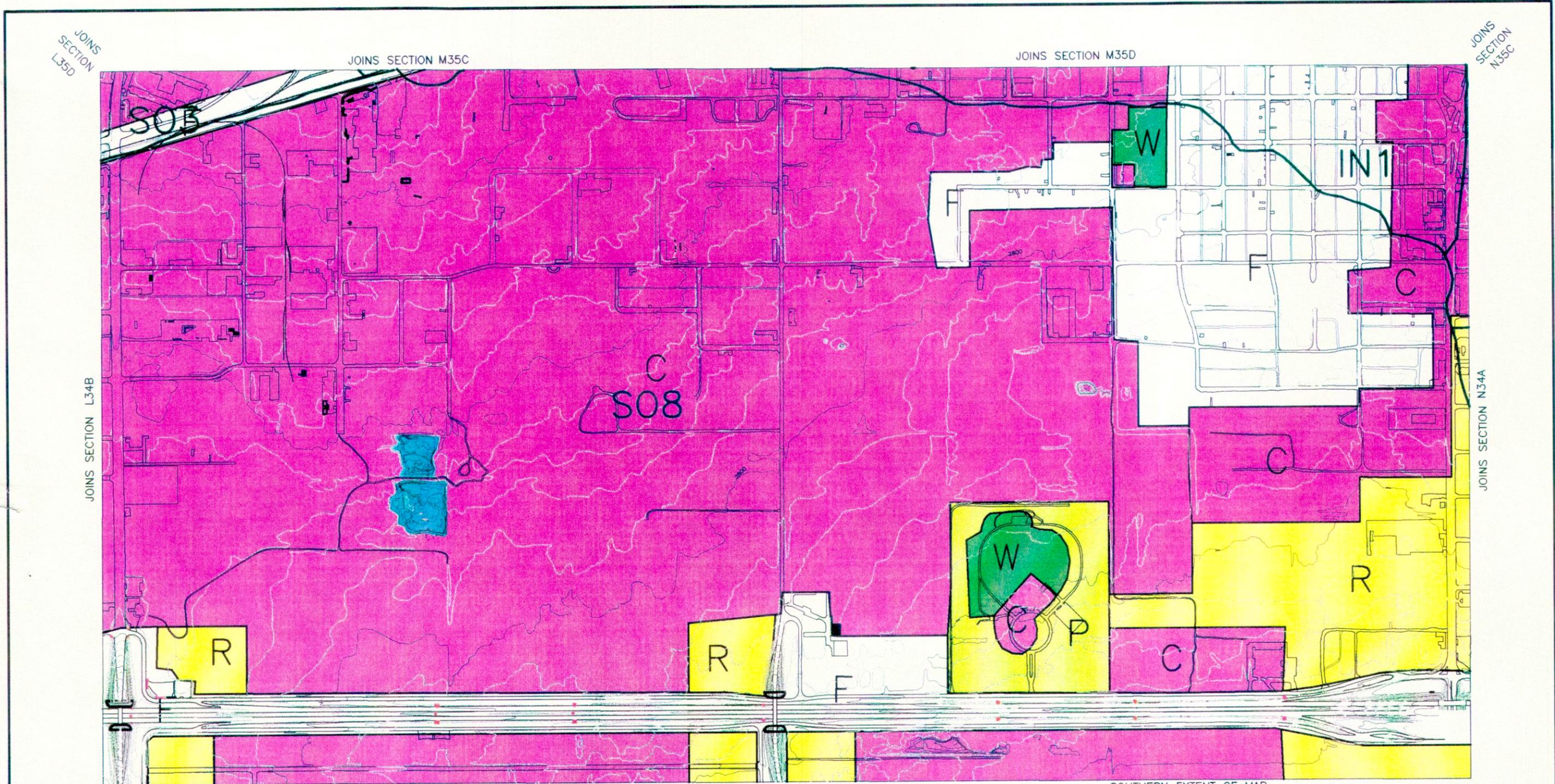
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FIGURE 7-12

L34AB 3/21/96 RSK



**SECTION M34A**

**SECTION M34B**

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 SOUTH CHANNEL MASTER PLAN  
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FIGURE 7-13

JOINS SECTION M35D

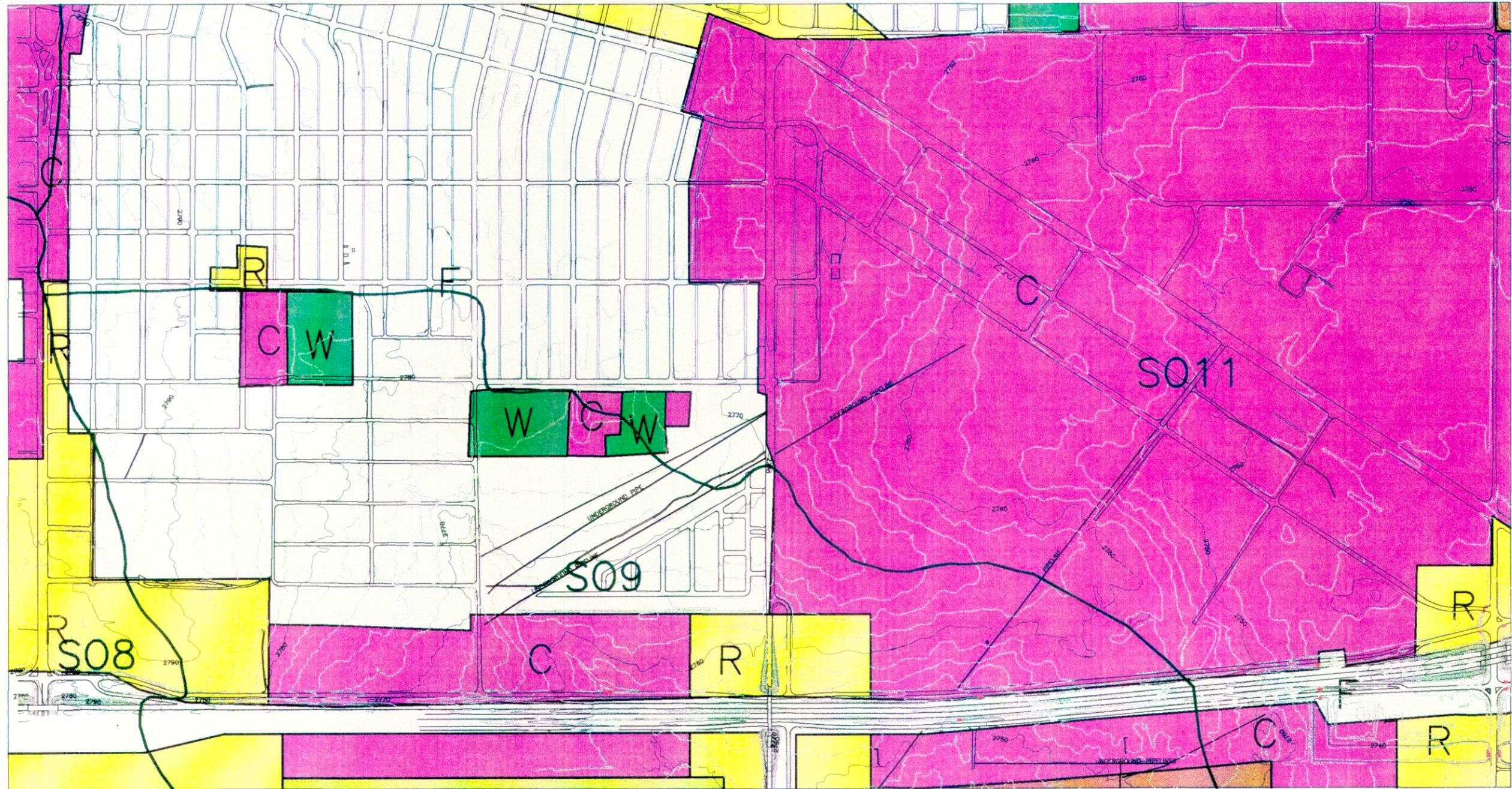
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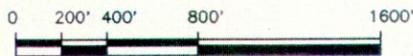
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**SECTION N34A**

**SECTION N34B**



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FIGURE 7-14

CITY OF MIDLAND, TEXAS  
SOUTH CHANNEL MASTER PLAN  
SECTION MAP



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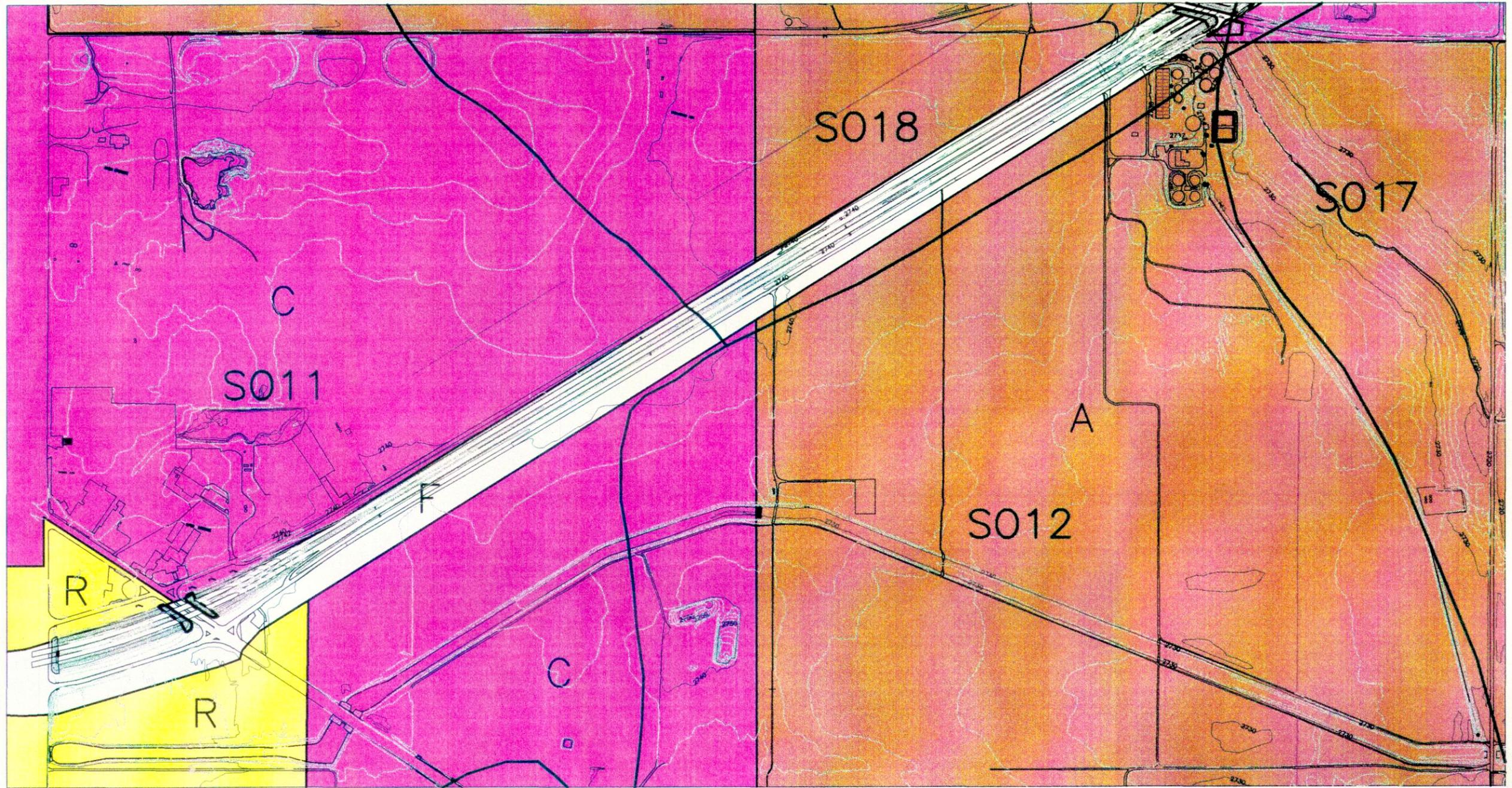
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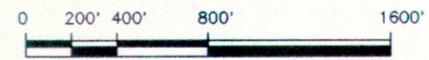
JOINS SECTION N34B

EASTERN EXTENT OF MAP



SECTION P34A

SECTION P34B



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SOUTH CHANNEL MASTER PLAN  
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FIGURE 7-15

RSK  
P34AB 3/21/9