DOWNTOWN DRAINAGE BASIN

SAPULPA CITYWIDE MASTER DRAINAGE PLAN

JUNE 2010

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CIVIL & WATER RESOURCE ENGINEERING
GEOGRAPHIC INFORMATION SYSTEMS

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SECTION 4. DOWNTOWN DRAINAGE BASIN

4.1. EXISTING CONDITIONS HYDROLOGY

The Downtown Drainage Basin is shown in **FIGURE 4-1**. The hydrologic soil groups and existing land use for these basins are shown in **FIGURE 4-2** and **FIGURE 4-3** respectively. Subbasins can be viewed in **FIGURES 4-2 AND 4-3** as well as with the studied storm sewer systems. More information regarding the hydrologic soil groups can be found in **SECTION 2.1 HYDROLOGIC ANALYSIS**.

The Downtown Basin was modeled as part of the Independence Drainage System using HEC-HMS. The hydrologic coefficients used for input in the HEC-HMS model include the drainage area, the lag time and the soil complex curve number (CN). A summary of hydrologic coefficients used for the HEC-HMS modeling is tabulated below in **TABLE 4-1** with more detailed data available in **APPENDIX 4-A**.

The HEC-HMS schematic used to develop the flow rates for the Independence Drainage System and the Downtown Drainage Basin is located in **APPENDIX 3-B** (with the Independence Drainage System) and a complete list of the flow rates for the existing conditions can be found in **APPENDIX 4-B**. **TABLE 4-2** shows the resulting flow rates at major junctions in the Downtown Basin.

4.2. EXISTING CONDITIONS HYDRAULICS

Floodplains were mapped for the 2-, 10-, 100- and 500-year frequency events for this drainage basin along with the floodplains for the High School Drainage Basin. Both are presented in **APPENDIX 4-C** and include buildings located within the floodplain.

The surveyed storm sewers in the Downtown Drainage Basin were modeled using StormCAD to analyze the existing pipe capacities. **FIGURE 4-4** shows the studied storm sewer systems for the Downtown subbasins. The Downtown storm sewer capacities using StormCAD are shown in **FIGURE 4-5**.

The storm sewer system in this basin is a combination of both concrete pipes and box culverts and clay pipe and masonry pipes. For the most part, the masonry pipes consist of concrete bottoms with masonry tops. N-values of 0.02 were used to evaluate the capacities of the various systems.

Currently, the storm sewer system is not fully utilized due to an insufficient number of inlets draining into the storm sewers. In addition, other than a small section of storm sewer in the area of E. Jackson between N. 7th Street and State Highway 97 and W. Line Avenue between State Highway 97 and Cedar Street, the majority of the storm sewer system carries a 10-year (or less) storm event.

APPENDIX 4-D lists the pipe segments, the 1-year total flow rates, the capacity of the pipe segments, an estimate of the flow entering the pipe segments and the resulting overland flow

City of Sapulpa Master Drainage Plan

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

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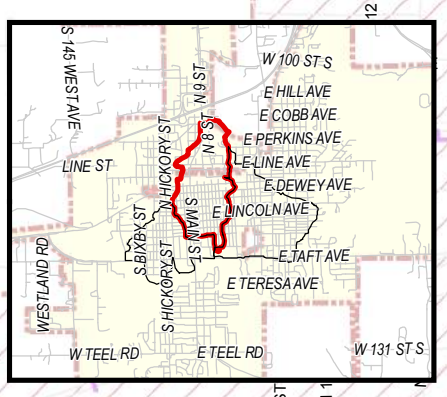

Index Map

Legend

- City Limits
- Storm Sewer
- Downtown System

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Downtown Systems
Downtown Drainage Basin

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Figure 4-1

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

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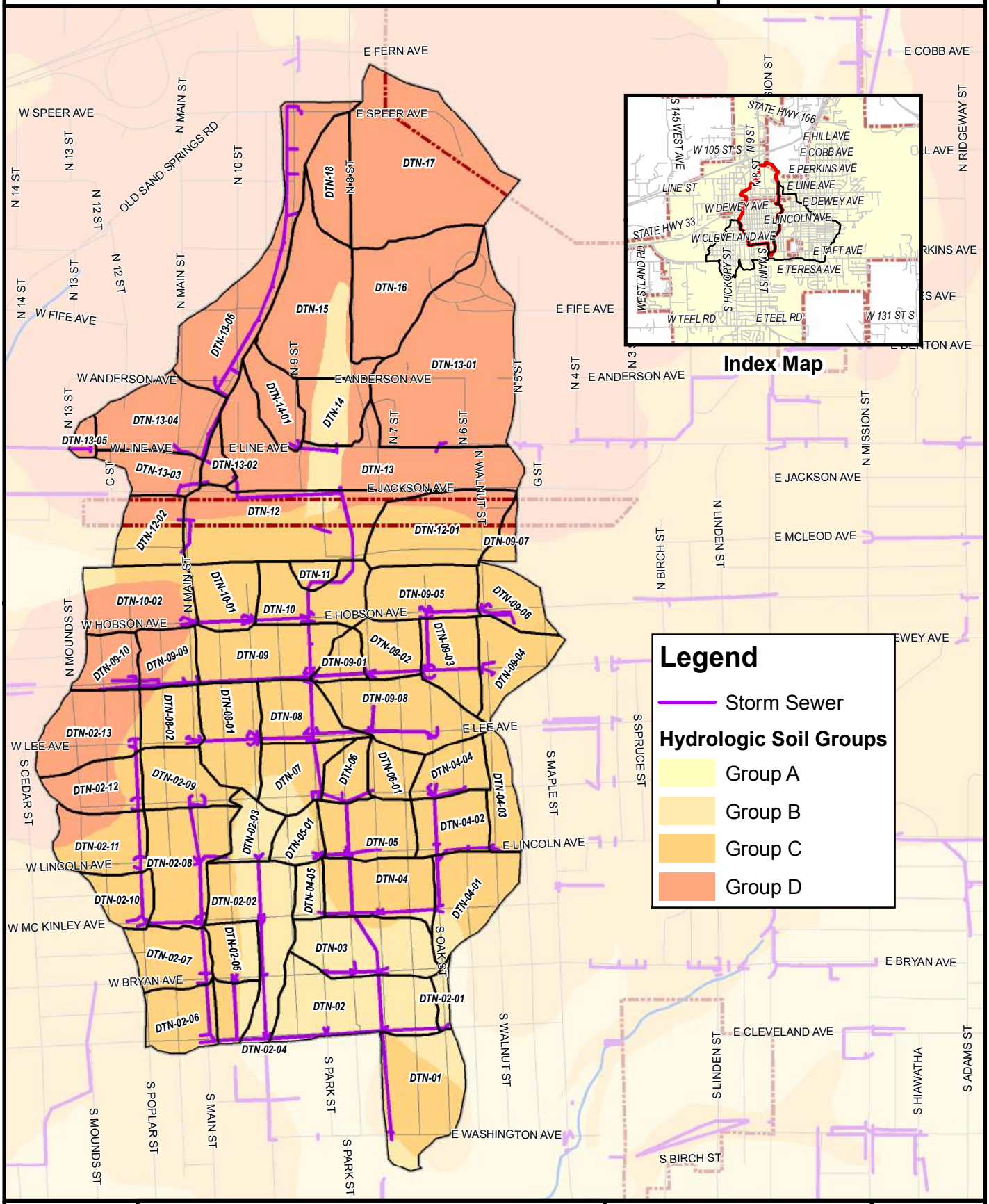

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Downtown Basin Hydrologic Soil Groups

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Figure 4-2

City of Sapulpa Master Drainage Plan

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

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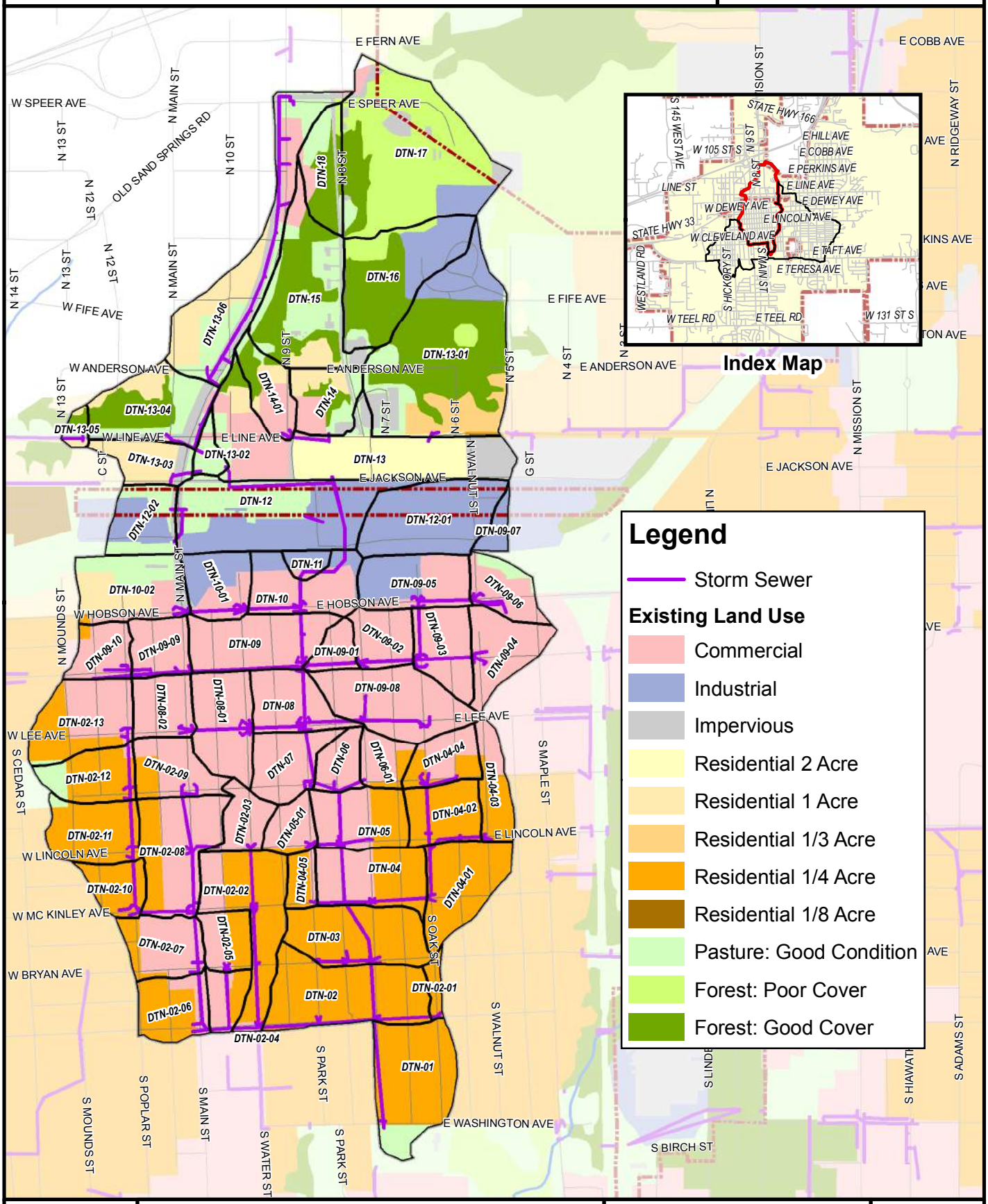

Index Map

Legend

- Storm Sewer

Existing Land Use

- Commercial
- Industrial
- Impervious
- Residential 2 Acre
- Residential 1 Acre
- Residential 1/3 Acre
- Residential 1/4 Acre
- Residential 1/8 Acre
- Pasture: Good Condition
- Forest: Poor Cover
- Forest: Good Cover

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Downtown Basin Existing Land Use

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Figure 4-3

FIGURE 4-1. DOWNTOWN DRAINAGE BASIN – SUMMARY OF HYDROLOGIC COEFFICIENTS EXISTING CONDITIONS

Sub-Area	Drainage Area, Acres	Lag Time, Minutes	Composite CN
DTN-01	8.7	5.3	81
DTN-02	10.5	3.0	75
DTN-02-01	0.9	1.6	75
DTN-02-02	9.0	4.2	79
DTN-02-03	2.9	1.5	92
DTN-02-04	2.3	1.0	88
DTN-02-05	3.0	1.5	86
DTN-02-06	4.6	2.9	86
DTN-02-07	4.9	2.1	92
DTN-02-08	8.5	3.7	91
DTN-02-09	4.6	2.3	92
DTN-02-10	3.0	2.4	83
DTN-02-11	5.8	2.0	84
DTN-02-12	4.6	3.0	85
DTN-02-13	7.4	2.2	91
DTN-03	8.1	2.1	75
DTN-04	6.8	2.3	88
DTN-04-01	6.9	3.9	81
DTN-04-02	4.5	2.1	83
DTN-04-03	3.5	2.4	87
DTN-04-04	3.7	1.4	89
DTN-04-05	1.7	1.8	79
DTN-05	5.7	1.7	90
DTN-05-01	2.6	1.4	91
DTN-06	2.5	1.0	94
DTN-06-01	2.6	2.0	91
DTN-07	4.8	1.6	93
DTN-08	4.9	2.3	94
DTN-08-01	6.4	2.1	94
DTN-08-02	3.8	1.5	94
DTN-09	7.7	3.9	94
DTN-09-01	1.9	1.4	94
DTN-09-02	3.6	2.6	94
DTN-09-03	4.9	2.6	94
DTN-09-04	5.2	2.9	94

Sub-Area	Drainage Area, Acres	Lag Time, Minutes	Composite CN
DTN-09-05	6.1	2.5	93
DTN-09-06	3.8	1.7	90
DTN-09-07	1.2	1.8	92
DTN-09-08	8.7	1.2	94
DTN-09-09	3.6	1.6	95
DTN-09-10	3.3	1.4	95
DTN-10	6.0	2.5	93
DTN-10-01	4.4	2.5	92
DTN-10-02	7.4	5.3	84
DTN-11	1.1	0.6	92
DTN-12	14.7	1.4	86
DTN-12-01	9.4	5.5	92
DTN-12-02	4.7	1.7	86
DTN-13	16.7	3.9	87
DTN-13-01	21.5	3.4	83
DTN-13-02	1.3	2.2	81
DTN-13-03	3.7	1.9	86
DTN-13-04	8.1	2.2	83
DTN-13-05	0.9	0.5	83
DTN-13-06	13.3	7.6	88
DTN-14-01	3.8	2.5	87
DTN-15	12.6	3.7	78
DTN-16	10.8	3.6	84
DTN-17	21.1	3.6	84
DTN-18	4.5	2.0	82

rates. Similar information is also available in **Appendix 4-D** for the 2-, 5-, 10-, 25-, 50-, 100- and 500-year storms.

In the Downtown Basin, the flow from the north side of the railroad tracks is controlled by a 3 x 3-foot concrete box culvert which limits the flow rates downstream to 80 cfs.

FIGURE 4-2 – DOWNTOWN DRAINAGE BASIN EXISTING FLOW RATES AT MAJOR JUNCTIONS (CFS)

HMS Junction	Street Intersection	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year	**Downstream Pipe Capacity (cfs)**
J-DTN-01	Washington & Elm	600	871	1296	1566	1907	2161	2413	2930	**N/A**
J-DTN-02	Cleveland & Elm	593	860	1277	1542	1876	2126	2373	2879	**325**
J-DTN-02-01	Cleveland & Oak	1	2	3	4	6	6	7	9	**7**
J-DTN-02-02	Cleveand & Water	116	185	272	326	396	446	495	594	**70**
J-DTN-02-06	Cleveland & Main	89	142	206	246	297	333	369	441	**52**
J-DTN-02-07	Bryan & Main	82	132	189	224	271	304	336	400	**37**
J-DTN-02-08	McKinley & Main	72	118	170	202	244	273	303	360	**37**
J-DTN-02-10	McKinley & Poplar	41	68	100	121	147	166	184	220	**25**
J-DTN-02-11	Lincoln & Poplar	36	60	88	105	127	143	159	189	**25**
J-DTN-02-12	Thompson & Poplar	27	44	63	74	90	101	111	132	**18**
J-DTN-02-13	Lee & Poplar	18	30	41	48	58	64	71	83	**10**
J-DTN-03	Bryan & Elm	474	681	1013	1224	1489	1688	1884	2287	**275**
J-DTN-04	McKinley & b/w Elm & Park	470	674	1000	1206	1466	1661	1853	2245	**250**
J-DTN-04-01	McKinley & Oak	33	56	85	103	127	144	160	193	**25**
J-DTN-04-02	Lincoln & Oak	23	39	58	69	85	96	106	127	**20**
J-DTN-05	Lincoln & b/w Elm & Park	429	620	918	1107	1346	1524	1700	2056	**275**
J-DTN-07	Thompson & b/w Elm & Park	411	596	883	1065	1295	1466	1635	1976	**210**
J-DTN-08	Lee & Park	404	586	869	1049	1276	1445	1611	1947	**270**
J-DTN-09	Dewey & Park	353	527	790	955	1165	1321	1475	1779	**250**
J-DTN-09-02	Dewey & Elm	10	16	21	24	29	32	35	41	**65**
J-DTN-10	Hobson & Park	251	389	600	733	901	1026	1148	1384	**250**
J-DTN-11	D.S. of RR	218	344	534	654	805	919	1029	1237	**90**
J-DTN-12	U.S. of RR	217	342	532	650	801	914	1023	1230	**90**
J-DTN-13	Jackson & 8th St.	152	248	388	475	587	670	752	911	**N/A**
J-DTN-15	Anderson & 8th St.	75	125	197	242	301	344	386	469	**N/A**
J-DTN-16	8th St.	53	87	135	164	202	229	257	310	**N/A**
J-DTN-17	8th St.	37	61	94	114	140	159	178	214	**N/A**

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

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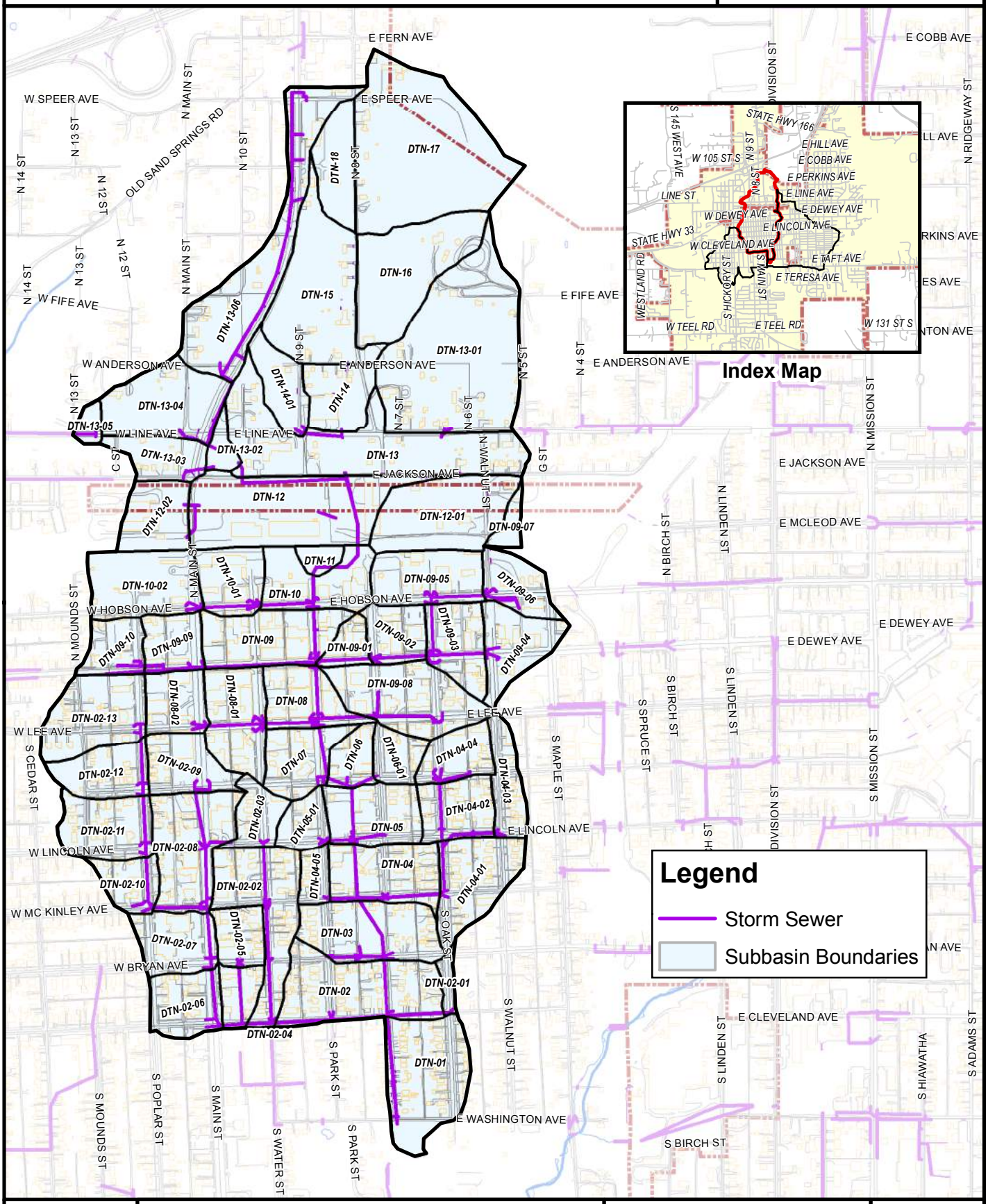

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Figure 4-4

STORMWATER
UTILITIES & MASTER DRAINAGE PLAN

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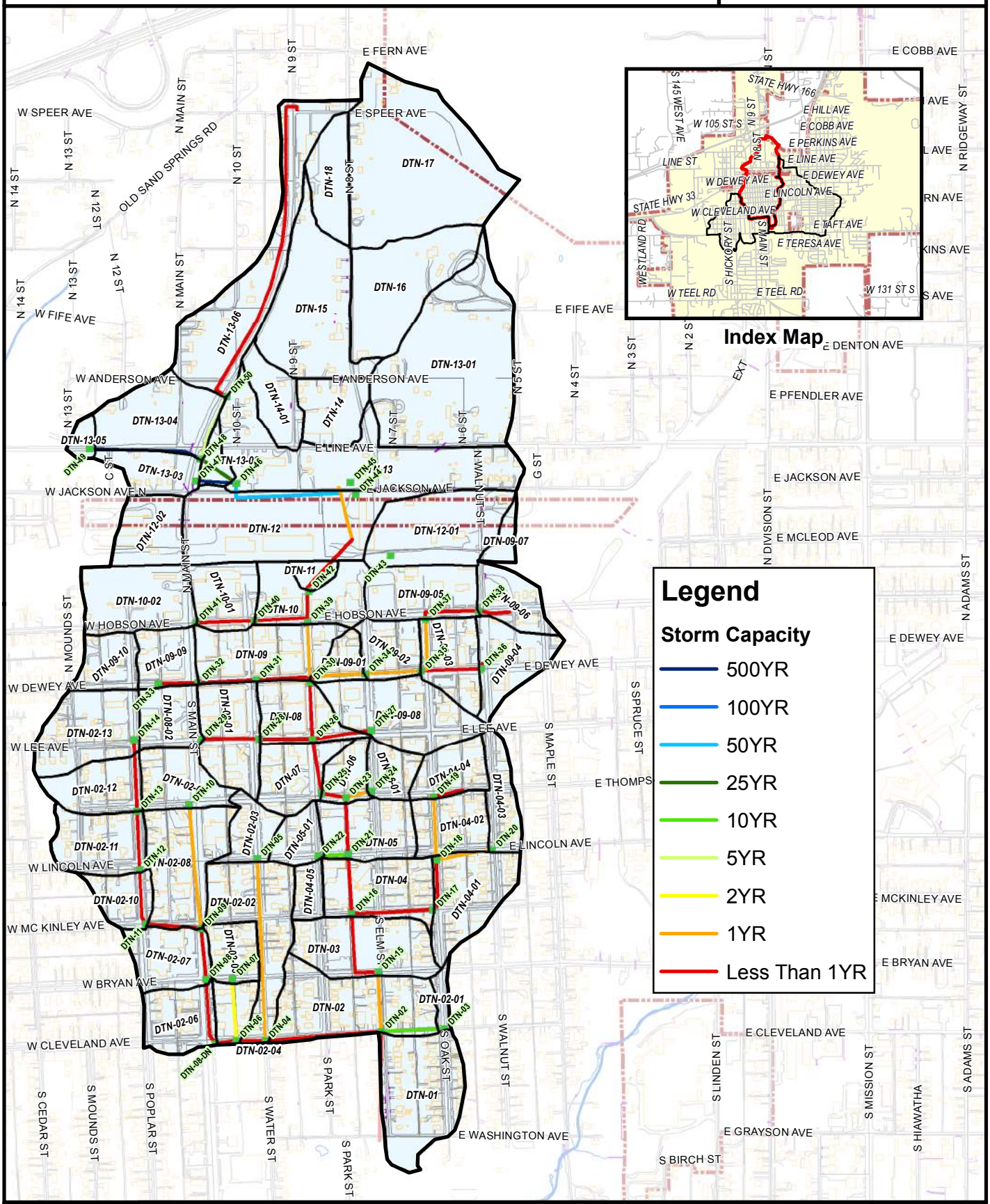

Downtown Basin Storm Sewer Capacity

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Figure 4-5

4.3. PROBLEM AREAS

This drainage basin is almost completely storm sewered south of the Burlington Northern Railroad (BNRR) to its outlet into Rock Creek. Modeling revealed that all of the storm sewer systems in the basin are currently surcharged by a 50% (2-year) or lower frequency storm. There have been complaints from the residents about this problem. The following provides a summary of Problem Areas identified for the Downtown System Drainage Basin. Locations of Problem Areas in the Downtown Drainage Basin can be found in **FIGURE 4-6**.

A. Problem Area 1: Storm Sewer Trunk System

The entire Downtown Drainage Basin storm sewer system is undersized from Line Street to its discharge point in the stormwater detention area south and west of Elm Street and Washington Avenue. The pipe capacities for this basin are discussed in the previous section. Additionally, the entire downtown area is drained by small inlets that are easily clogged and are inadequate to utilize fully the existing storm sewer capacity. More detailed data on the specific pipe and inlet capacity are available in **APPENDIX 4-E**.

B. Problem Area 2: 520 N. 8th Street

The area located in the northern portion of the Downtown Drainage Basin receives stormwater from Drainage Subbasin DTN-17. The stormwater, at one time, was directed across the street to the ditch on the west side of 8th Street; however, at some time in the past, the homeowners blocked the flow so it now flows down the east side of the roadway. As a result, there has been considerable degradation of the ditch and serious undermining of the roadway. Left uncorrected, this problem will eventually result in the failure of the roadway will and, obviously, presents a very serious danger to public safety.

The ditch along the west side of the roadway receives stormwater from Drainage Subbasin DTN-17. At the church on the east side of 8th Street north of Anderson, the water from the ditch on the east side of 8th Street discharges across the roadway in a small pipe. Both roadways, 8th Street and Anderson Avenue, are overtopped, and stormwater is directed between two houses on the south side of Anderson Avenue.

Water from the northern areas west of 8th Street drains to the north side of the residence at 520 N. 8th Street.

C. Problem Area 3: 17 S. Park Street, 20 S. Water Street and 122 E. Lee Avenue

In the downtown commercial area, inlets are undersized for accommodating heavy rains. The result is flooding to buildings. Parking areas stand in water and inlets are easily clogged. **APPENDIX 4-E** shows the estimated inlet capacities compared to the flow rates at these locations.

The 18-inch RCP on the east side of the intersection receives water from antiquated inlets and lead pipes which then drain into a 12-inch VCP with very little capacity. This causes problems at 17 and 20 S. Water Street, as well as 17 S. Park Street. The inlet capacity at Lee and the pipes leading to the 66-inch pipe at Park Street are inadequate as well.

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

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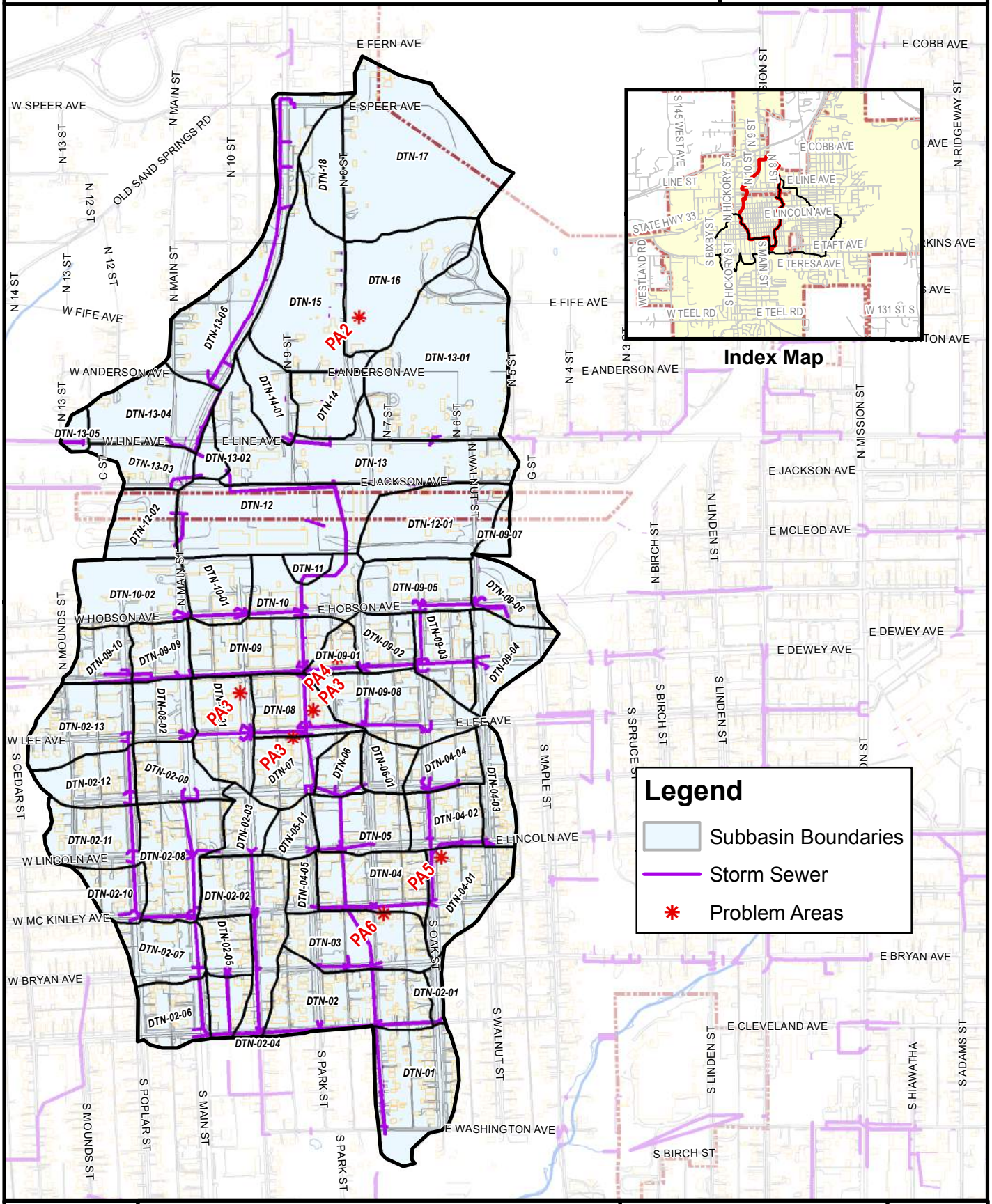

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Downtown Basin Problem Areas

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Figure 4-6

D. Problem Area 4: 215 E. Dewey Avenue (Doodles Hallmark)

In this part of the Downtown Drainage Basin, runoff from the alley has no access to the storm sewer system.

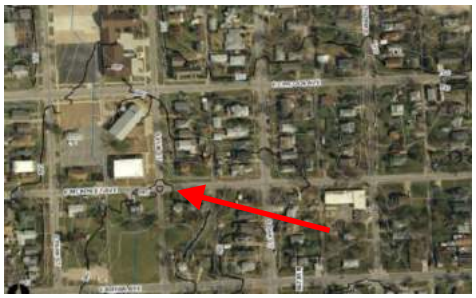
E. Problem Area 5: 301 S. Oak Street

In this location, inlets are too small and easily clogged. Gravel from the alley continues to clog the storm drain.

Additionally, the storm sewer system consists of two 18-inch pipes that join at the intersection of Oak and Elm Streets to become a single 18-inch pipe. This causes more backup in this area.

F. Problem Area 6: 302 E. McKinley Avenue

Stormwater from the east and the north fills the intersection and floods cars. The picture on the farthest right is taken from the direction of the arrow during a period of heavy rain.



Stormwater also surrounds the house at 302 E. McKinley Avenue and crosses Elm Street approximately halfway between McKinley Avenue and Bryan Avenue.

4.4. EVALUATION OF ALTERNATIVES

Six Problem Areas were identified in the Downtown Drainage Basin. For each of these Problem Areas, alternative solutions were considered and evaluated. Summary alternative evaluations are described below with summary costs for improvements located in **APPENDIX 4-F**.

A. Problem Area 1: Storm Sewer Trunk System

Four alternatives were analyzed for that part of the Downtown area to the south of Dewey Avenue. All alternatives propose a detention facility to detain stormwater from the northern portion of the Downtown Drainage Basin until the downstream portion of the basin can pass the upstream water with no adverse impacts. In addition, the entire trunk line of the storm sewer would have to be increased in capacity, as well as that of the tributary system, in order to address drainage problems occurring in the downstream portions of the basin.

All downtown alternatives assume that the flow from the detention area, shown to the right, would have a controlled release of 90 cfs. Currently, the flow is controlled up to an elevation of approximately 730 feet as all of the downtown drainage subbasins north of the railroad drain to the location shown and are metered out through a 3 X 3 foot RCB. In its current, mostly urbanized state, this requires a 100-year storage volume of 40 acre-feet; this volume is achievable on this site.

All alternatives would require the acquisition of approximately 400,000 square feet of Burlington Northern Railroad (BNRR) property with buildings currently not being utilized. The remainder of the construction would consist of excavation and construction of an outflow control although one sanitary sewer main might be affected.

Excluding the acquisition of the property, this project is estimated to cost $3,095,000. The purchase price of the property would be subject to negotiations with BNRR.

Alternative 1 – Replace entire trunk line with a 5-year storm capacity. This alternative is the most costly and requires the re-construction of the entire system from Washington Avenue and Elm Street north to the intersection at Dewey Avenue and Park Street as a single project. The tributary systems along Water Street from Lincoln Avenue south to Cleveland Avenue and along Cleveland Avenue from Water Street to Elm Street would also be replaced as a part of this alternative. The existing connection along Main Street from Bryan Avenue to McKinley Street would be removed, and a new connection would be established from Main Street east along McKinley Avenue to the Water Street tributary.

The cost for this alternative is estimated to be $5,561,000 and alternative details are shown in **Figure 4-7**.

Alternative 2 – Construct a diversion system along Park Street. The existing trunk line in the downtown system runs along N. Park Street from approximately Hobson Avenue south to Thompson Avenue. From there, it continues eastward to the first alley and then southerly down the alley to Bryan Avenue. At Bryan Avenue, the line runs south to Elm Street and Washington Avenue.

In this second alternative, the existing line would be replaced with a 6 X 6 foot RCB between Dewey Avenue and Thompson Avenue. At the intersection of Park Street and Thompson Avenue, a diversion would allow some of the water to flow through a new 78-inch RCP constructed along Park Street south to McKinley Avenue. At McKinley Avenue, the new diversion system, now an 84-inch RCP would turn west and join the Water Street tributary system. To accommodate the higher volume of water through the diversion, the Water Street tributary would be completely replaced with a higher capacity 90-inch RCPS and continue south to Washington Avenue.

As in Alternative 1, the existing west connection along Main Street between Bryan and McKinley Avenues would also be removed, and a new connection would be established to the Water Street tributary system from Main Street west along McKinley Avenue.

The cost for this alternative is $4,460,000 and is depicted in **Figure 4-8.**

Alternative 3 – Construct a diversion system along Elm Street from Dewey Avenue to Washington Avenue. The third alternative calls for the construction of a diversion at the intersection of Elm Street and Dewey Avenue to reduce the flow in the existing 66-inch RCP along Park Avenue; this would allow the existing system to carry the flow for a 20% annual chance event (5-year) which would remain after the diversion. The water diverted south through the new system constructed along Elm Street, or through parking lots in which Elm Street is not through, would also be designed to carry the 20% annual chance flow rate (5-year).

South on Elm Street between McKinley and Bryan Avenues, the new diversion system would join the existing system. From that point downstream to immediately south of Cleveland Avenue, the existing system would be replaced to accommodate the 20% annual chance storm event or 5-year storm. Just south of Cleveland Avenue, the system would discharge to the east half of the block bordered by Cleveland Avenue, Elm Street, Washington Avenue and Park Street.

Currently, homes have been purchased in this frequently flooded area such that four of the nine lots bordering Elm are vacant. This alternative would include the acquisition and demolition of the five remaining structures to allow overflow into an excavated area similar to that immediately south of Washington Avenue.

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

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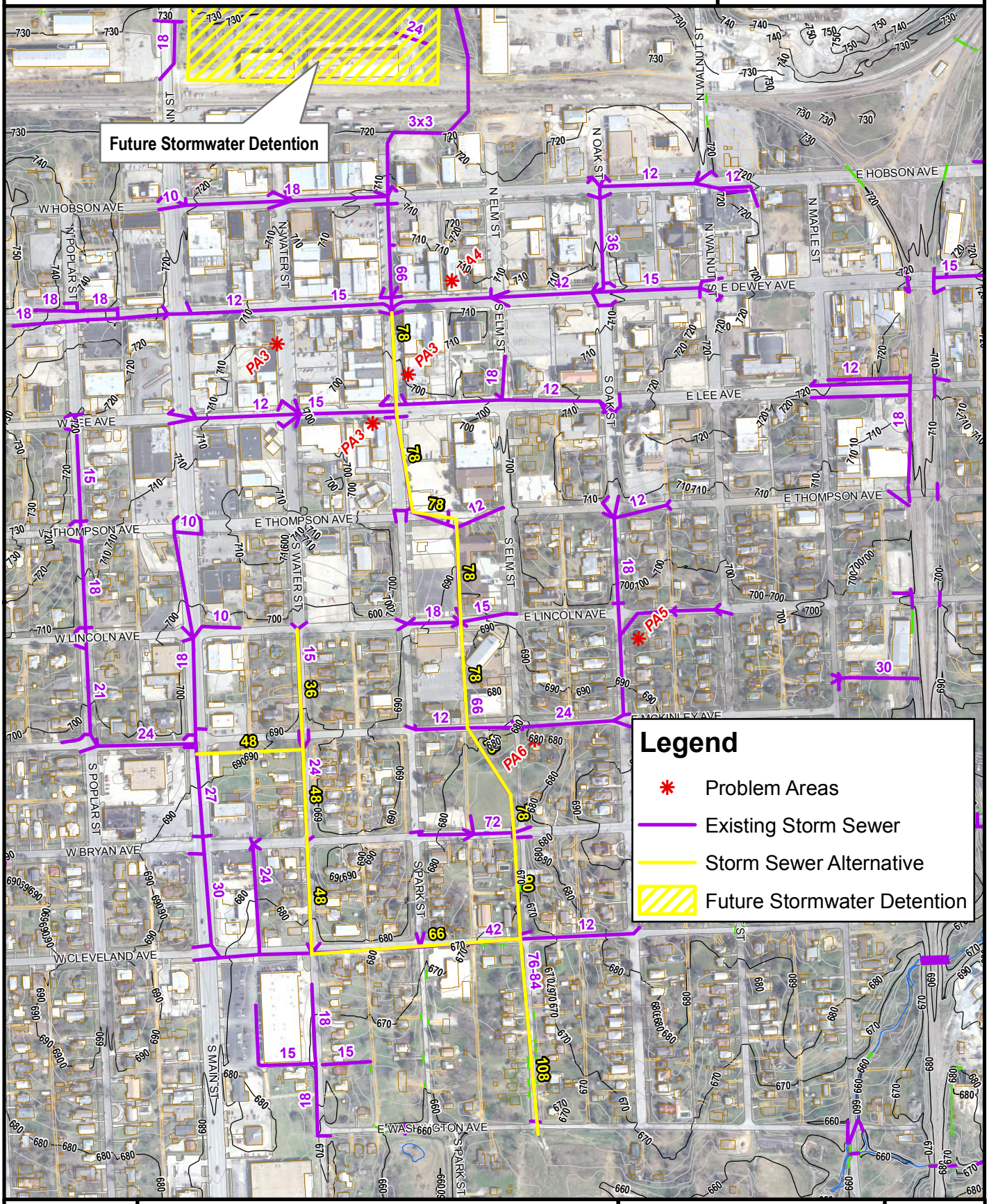

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Downtown Basin
Problem Area 1
Alternative 1

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Figure 4-7

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STORMWATER UTILITIES & MASTER DRAINAGE PLAN

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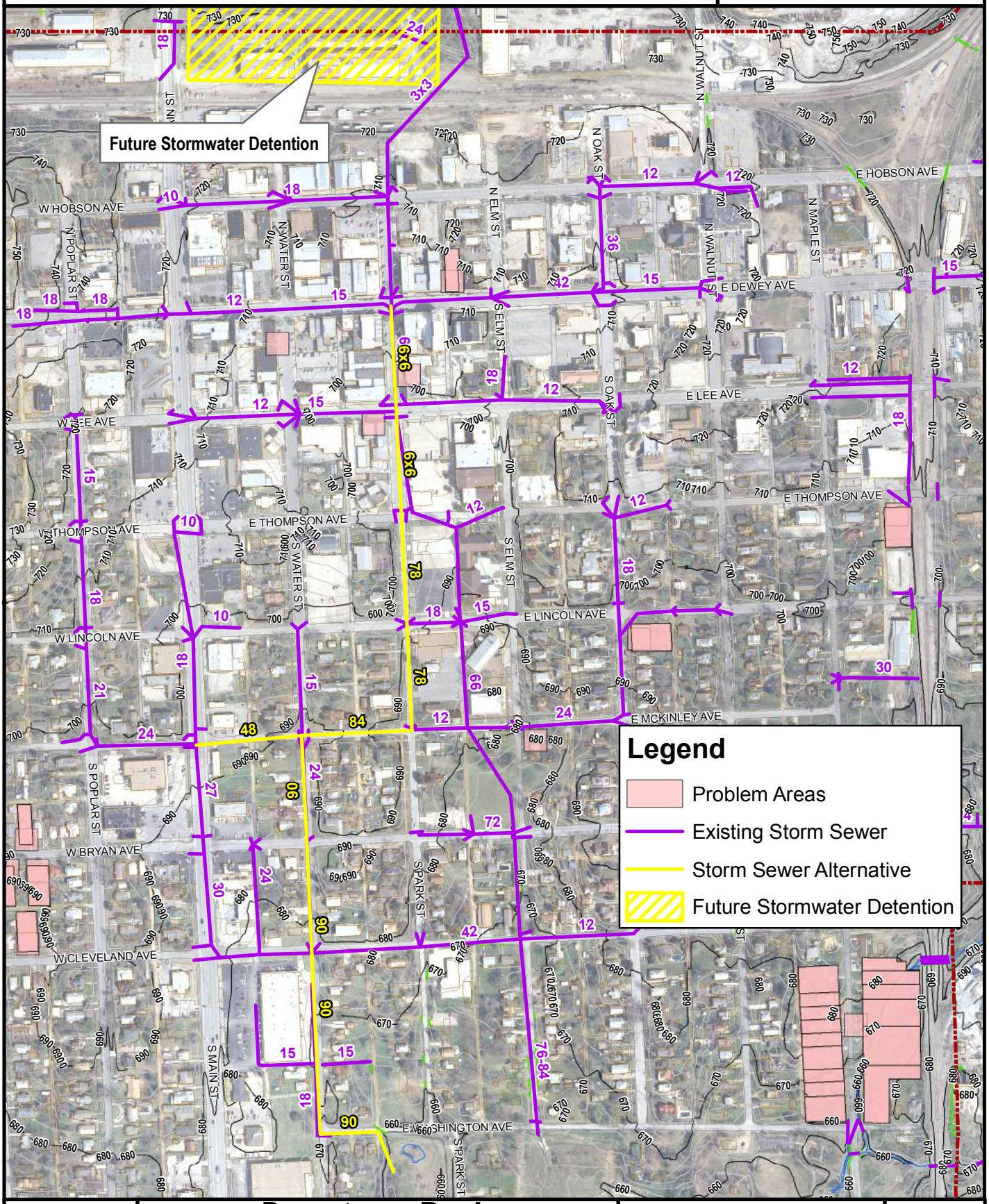

Downtown Basin Problem Area 1 Alternative 2

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Figure 4-8

Similar to Alternative 2, the Water Street tributary would be completely replaced with higher capacity pipes to carry a 20% annual chance storm event. The major variation would be that it would not be connected to the main diversion system as is proposed in Alternative 2.

The cost for this alternative is $4,560,000 and is detailed in **Figure 4-9**. However, this alternative does not include the cost of any of the proposed acquisition and demolition. More study of this component is needed.

Alternative 4 – Construct a diversion system along Elm Street and Park Street. This alternative incorporates several components of the previous three alternatives. First, the water from the intersection at Elm Street and Dewey Avenue would be diverted south along Elm Street to Thompson Avenue. Then the diverted flow would be re-introduced to the existing system at the alley south of Thompson Avenue between Elm and Park Streets. The diversion upstream of Thompson Avenue would allow the existing Park Street system to carry the 20% annual flows (5-year) to this location.

At the intersection of Park Street and Thompson Avenue, a second diversion would be constructed south along Park Street, although some water would still be allowed to flow through the existing system. At McKinley Avenue, the new diversion system would veer west one block to join the Water Street tributary system.

To accommodate the higher volume of water through the diversion, the Water Street tributary, from McKinley Avenue, would be completely replaced with higher capacity pipes south to Washington Avenue where it would then discharge into the low area southwest of Washington Avenue and Park Street. This low area is privately owned and would require the City to acquire a drainage easement or the land itself in order to allow the water to drain to this location.

The cost for this alternative is $4,273,000 and is shown in **Figure 4-10.**

B. Problem Area 2: 520 N. 8th Street

Alternative 1 – Construct a pipe system with a 10% annual chance frequency (10-year) from approximately 520 North 8th Street to Jackson Avenue. Due to limited construction area and available right-of-way, this alternative involves the construction of a completely new storm-sewer system. Upstream at the point at which Drainage Subbasin DTN-17 discharges into the ditch on the east side of the roadway, the first leg of the storm sewer system would be a 42-inch RCP with inlets, as required.

The 42-inch RCP would extend to the driveway culvert for the Pentecostal Mission Church which is located on the northeast corner of N. 8th Street and Anderson Avenue. At that point, the pipe size would become a 54-inch RCP across 8th Street diagonally and continue in a southwesterly direction to Anderson Avenue. Here a 60-inch RCP pipe would collect the water from the west side of the roadway and then extend south to and across Jackson Avenue to the proposed detention facility located on the BNRR property. As a result, this alternative must be phased or constructed in conjunction with construction of the downstream detention.

City of Sapulpa Master Drainage Plan

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

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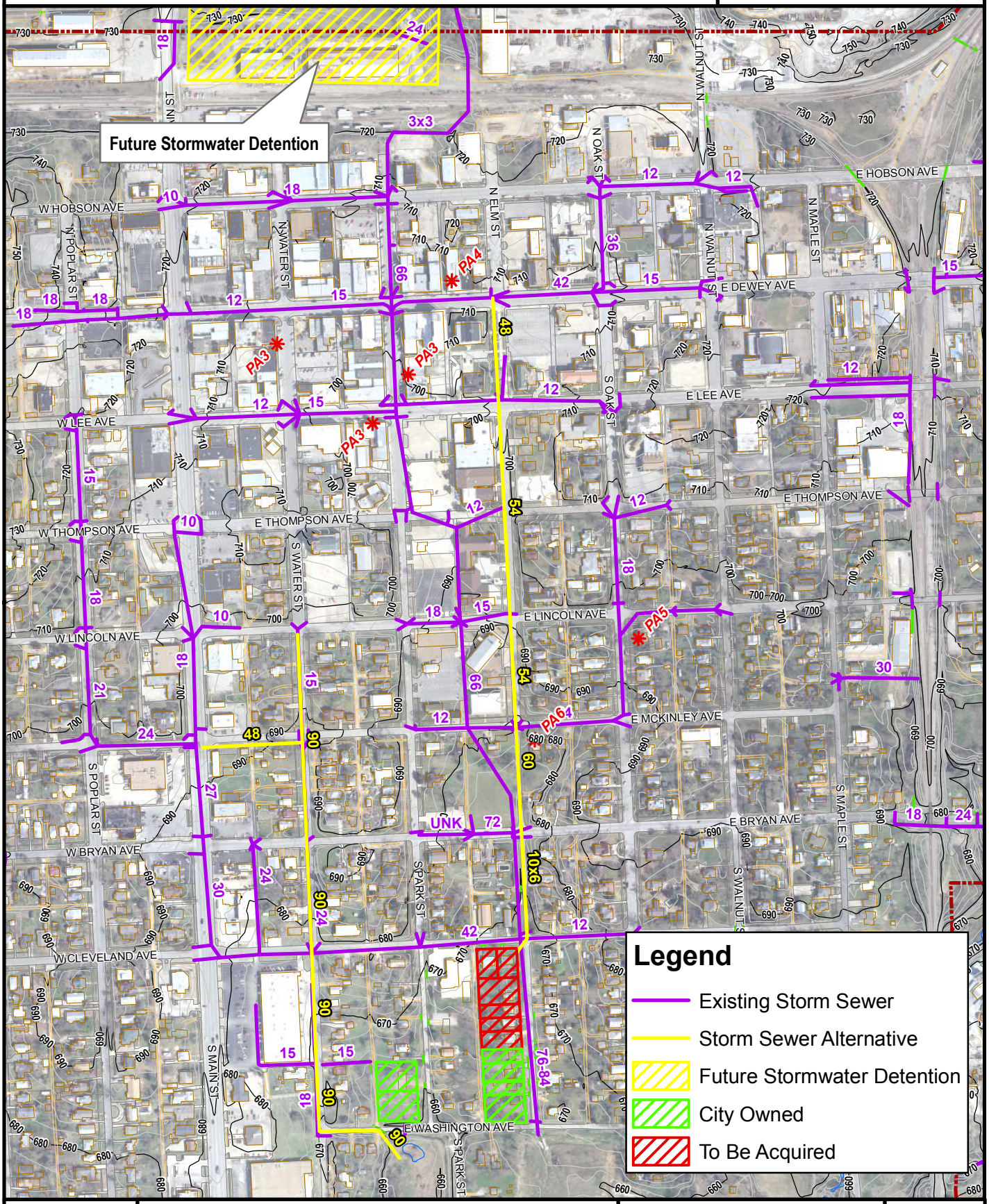
0 250 500
N



Legend

- Existing Storm Sewer
- Storm Sewer Alternative
- Future Stormwater Detention
- City Owned
- To Be Acquired

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Downtown Basin Problem Area 1 Alternative 3

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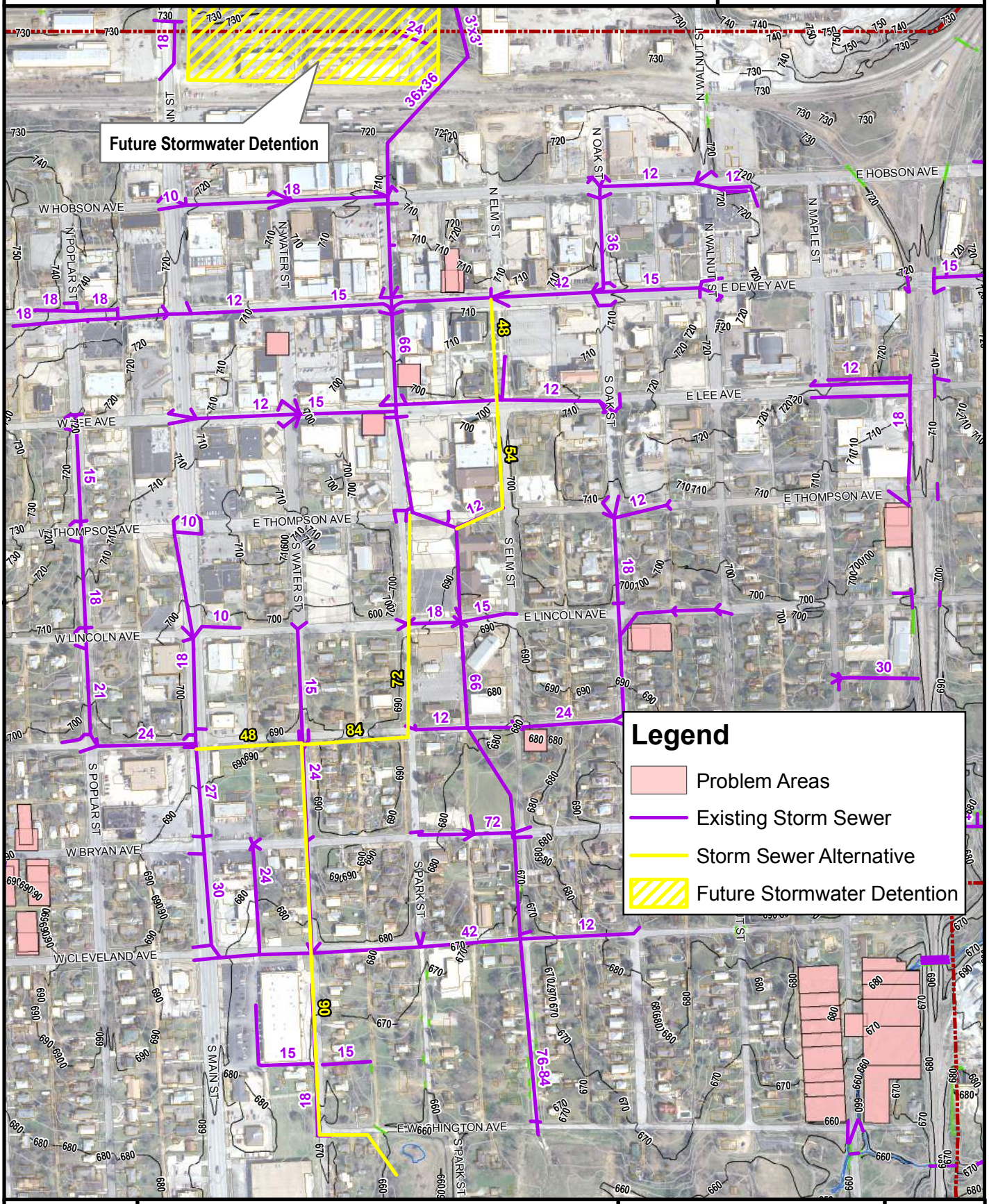
Figure 4-9

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

Feet
0 125 250 500
N



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Downtown Basin Problem Area 1 Alternative 4

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Figure 4-10

The cost for this alternative is $914,000 and is shown in **Figure 4-11**.

Alternative 2 – Construct a 10% annual chance pipe system from approximately 520 North 8th Street to Jackson Avenue and include upstream stormwater detention. This alternative is similar to Alternative 1 except it would add a 4.0 acre-foot stormwater detention facility generally northeasterly of N. 8th Street and Okmulgee Avenue.

The upstream detention would limit the flow in the existing ditch and thereby reduce the pipe sizes. This would allow the flow in the 42-inch RCP segment in Alternative 1 to be contained instead in a 24-inch RCP. The 54-inch segment would be replaced with a 36-inch pipe, and the 60-inch segment would be replaced with a 48-inch RCP and 54-inch RCP. The upstream stormwater detention facility would be designed to control the 100-year storm with a 500-year spillway as a dam safety precaution.

As in Alternative 1, this alternative would outfall into the proposed BNRR detention facility and would require phasing in conjunction with the construction of the downstream detention.

The cost for this alternative is $756,000 and is depicted in **Figure 4-12**.

C. Problem Area 3: 17 S. Park Street, 20 S. Water Street and 122 E. Lee Avenue

Alternative 1 - Inlet replacement. These Problem Areas have been addressed as part of a larger analysis to determine those areas underserved by storm sewer inlets and pipes in the downtown area. To facilitate this analysis, the inlet inventory, found in **Appendix 4-D**, along with the peak flow rates from the drainage subbasins draining to each intersection or group of inlets, was analyzed based on the following general assumptions:

- The inlet locations were “sumped” to allow for 1 foot of depth to occur.
- All inlets were assumed to be 70% blocked as per the City’s design standards.
- The throats behind the grates were ignored, because the throats were assumed to collect debris from the grate.

The formulas used to estimate grate flow and throat flow are as follows:

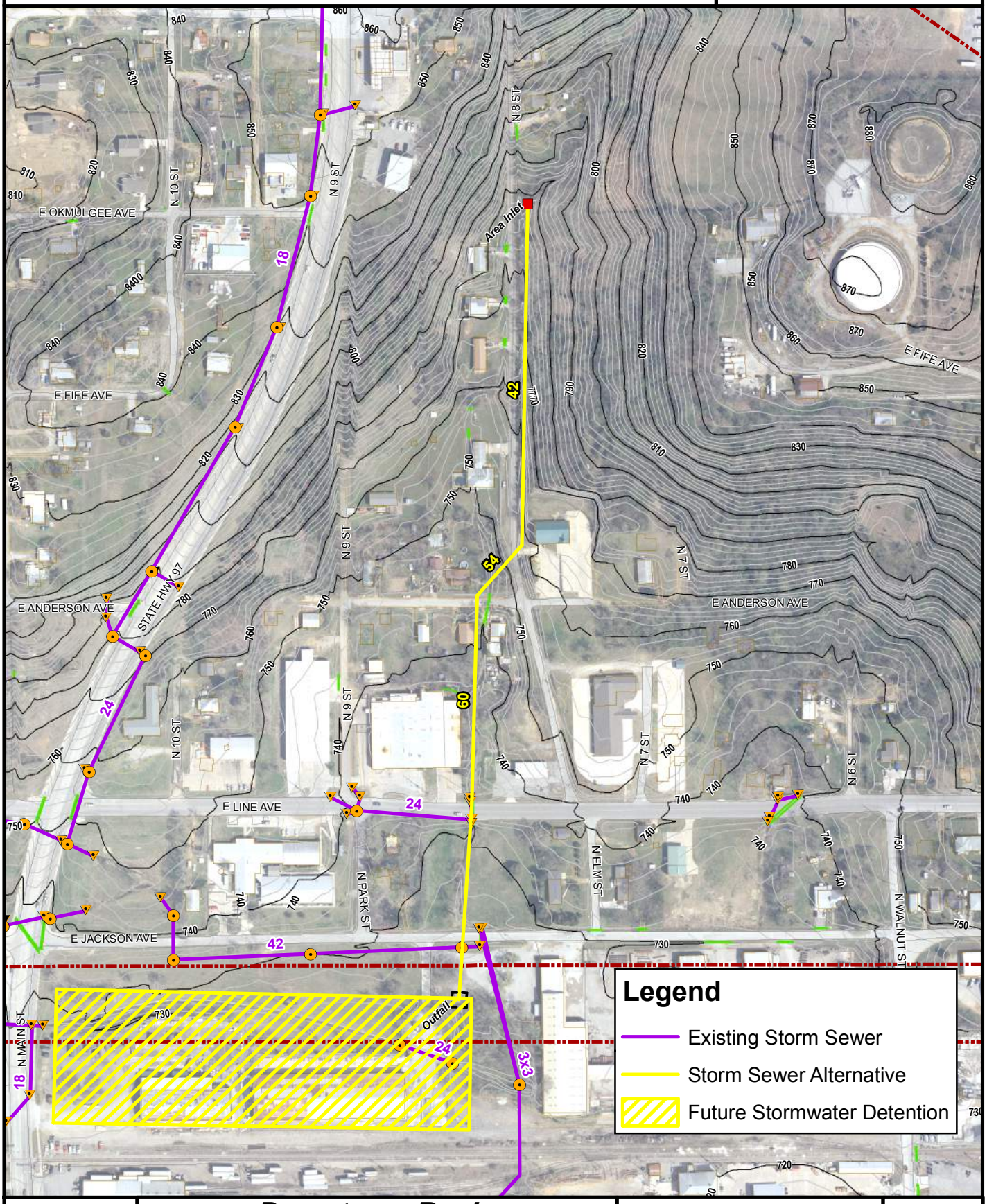
$$Q_{grate} = 30\% * (7.22 * depth^{0.5}) * (\#\ of\ grates)$$

$$Q_{throat} = (0.6 * 1\ sf * (2 * 32.2 * (d - 0.21))^{0.5} * (\#\ of\ throats - \#\ of\ grates).$$

The analysis showed that replacing the grates and lead pipes at the following locations would make a significant difference in roadway flooding and the listed problem areas that flood due to inadequate storm sewers:

- Poplar Street and McKinley Avenue
- Water Street at Dewey and Lincoln Avenues
- Dewey Avenue between Main and Water Streets
- Park Street at Hobson, Dewey, Lee and Thompson Avenues

City of Sapulpa Master Drainage Plan



Downtown Basin Problem Area 2 Alternative 1

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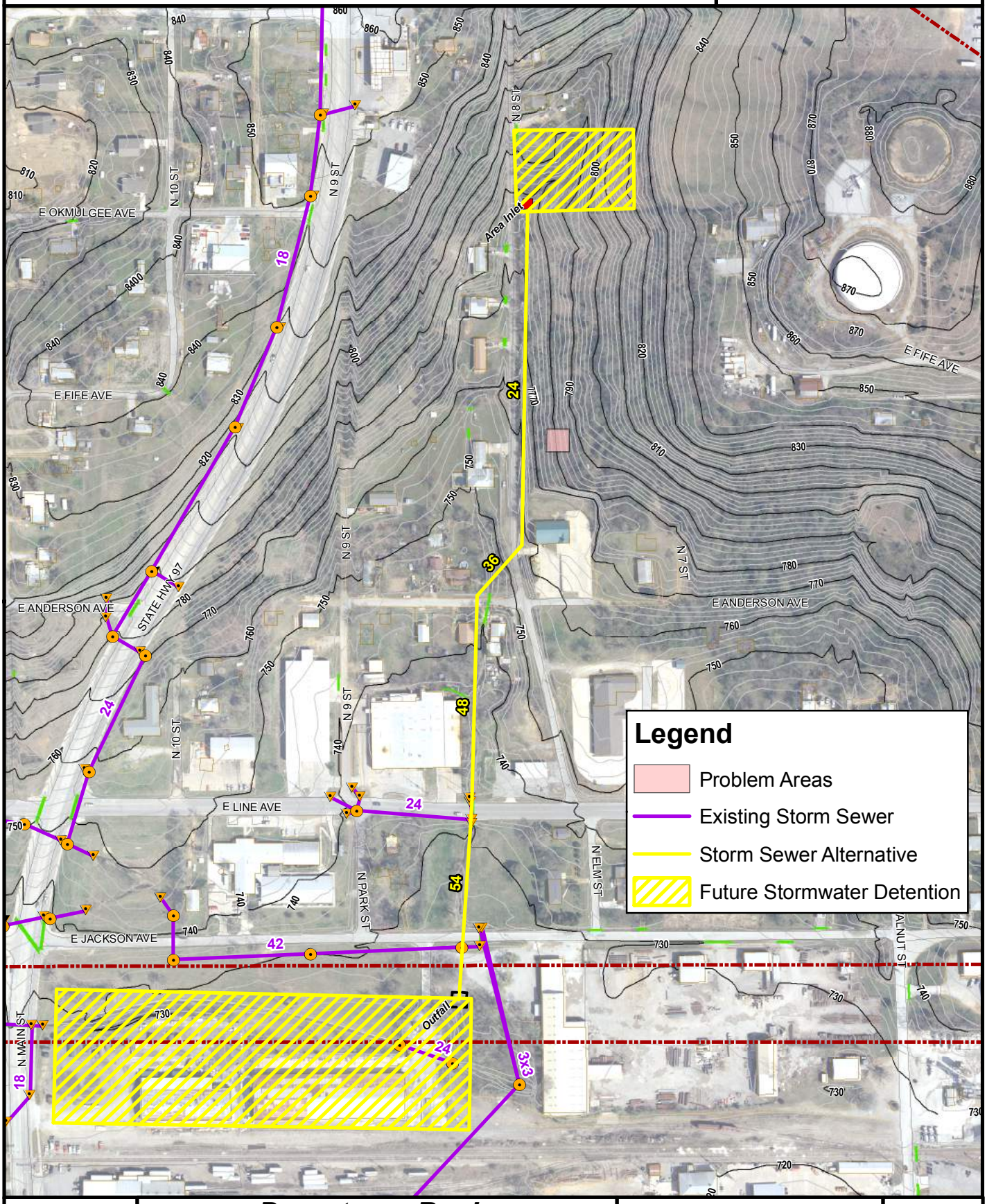
Figure 4-11

City of Sapulpa Master Drainage Plan

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

Feet
0 75 150 300
N



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Downtown Basin
Problem Area 2
Alternative 2

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Figure 4-12

- Elm Street at Dewey and Lincoln Avenues
- Oak Street at Hobson, Dewey and Thompson Avenues
- Thompson Avenue at the alleys east of Park and Oak Streets.

In total, 66 inlets would be replaced and/or added to the above locations. Inlets would be sized for the recommended plan and placed accordingly.

In addition, the 12-inch VCP pipe on Dewey Avenue between Main and Park Streets would be replaced with a 30-inch RCP to capture all the water upstream rather than allowing it to overflow into the parking lots.

This inlet alternative would also add a 42-inch RCP to the existing 66-inch pipe located at the junction south of Thompson Avenue between Park and Elm Streets and the intersection of Lincoln Avenue and the alley east of Park Street. Currently, this is a flatter section of pipe which limits the effectiveness of the upstream improvements.

A major advantage to this alternative is that it can easily be constructed in phases. As this alternative is funded and implemented, the cost of it would be subtracted from the recommended plan for the main trunk line. This would provide localized benefits while reducing the overall cost of the trunk line.

At the City of Sapulpa's request, very preliminary design plans were developed from field investigations and estimates prepared. Based on the more detailed study level, the cost for this alternative was estimated to be $2,347,000 and is shown in **Figure 4-13**. These costs were broken out by intersection and were provided to the City of Sapulpa in April 2010.

D. Problem Area 4: 215 E. Dewey Avenue (Doodles Hallmark)

Alternative 1 - Construct inlets and manhole with connecting 18-inch RCP. This location has no access to the 42-inch RCP at Dewey Avenue. This alternative would construct an inlet in the alley just north of Dewey Avenue and then tie it into the manhole to the south with an 18-inch RCP. The estimated public cost for this portion of this alternative is $24,700.

In addition, at some time in the future, development north of this area would require the extension of the 18-inch RCP from the new inlet in the alley to a second inlet approximately 160 feet north of the first inlet. This construction would be a non-public cost associated with development of the area to the north. It is estimated that the extension of the 18-inch RCP and an additional inlet would cost $41,100.

All improvements are depicted in **Figure 4-14.**

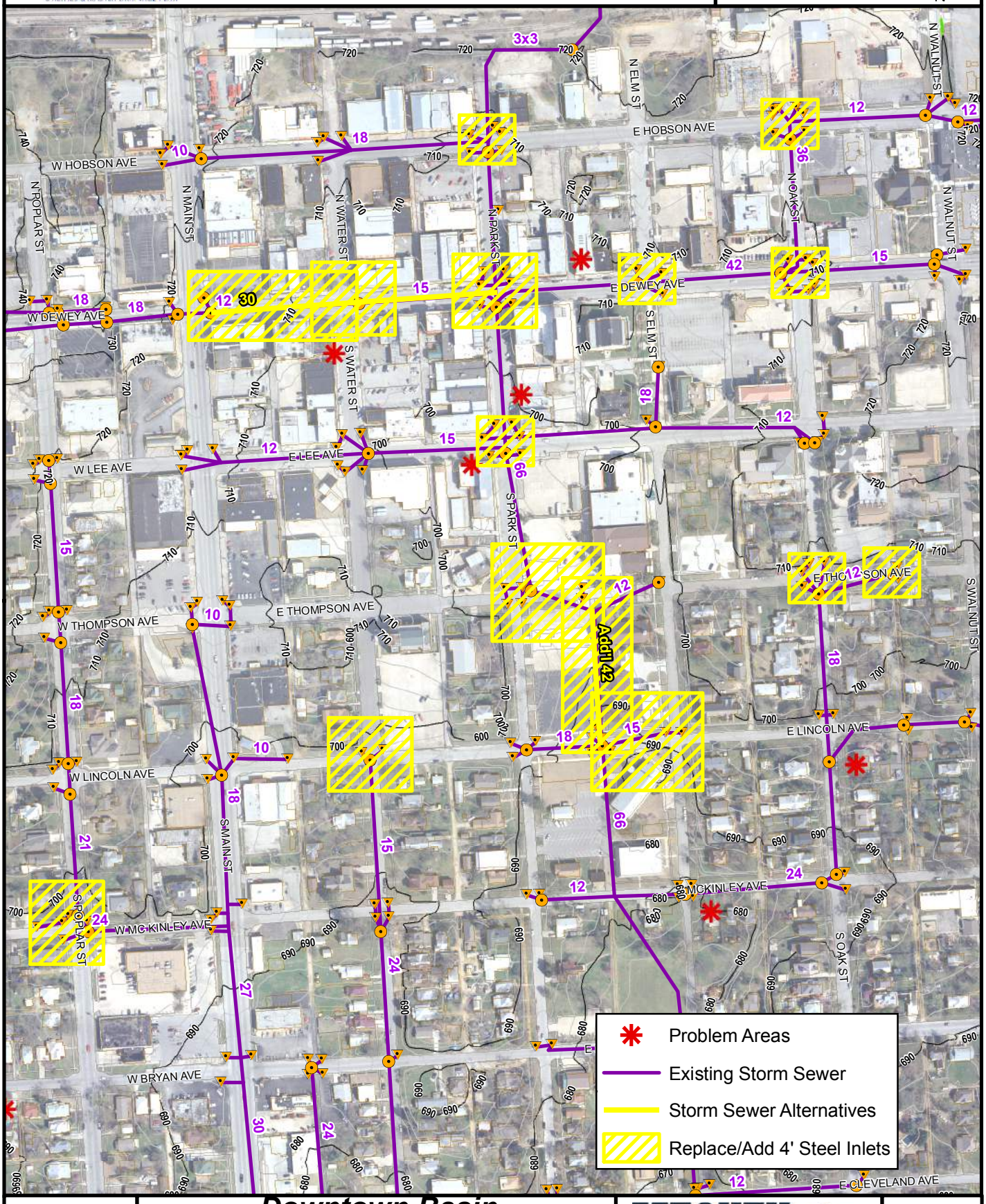
E. Problem Area 5: 301 S. Oak Street

Alternative 1 - Inlet construction and sewer upgrade. The inlet capacity at this location is inadequate for draining the flow from the intersection; the downstream pipe capacity is also inadequate. Under this alternative, inlets would be installed at the intersection of Lincoln Avenue and Oak Street and at the Lincoln Avenue alley east of Oak Street. These inlets would

STORMWATER
UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

Feet
0 175 350
N



Downtown Basin
Problem Area 3
Alternative 1 -Inlet Replacement

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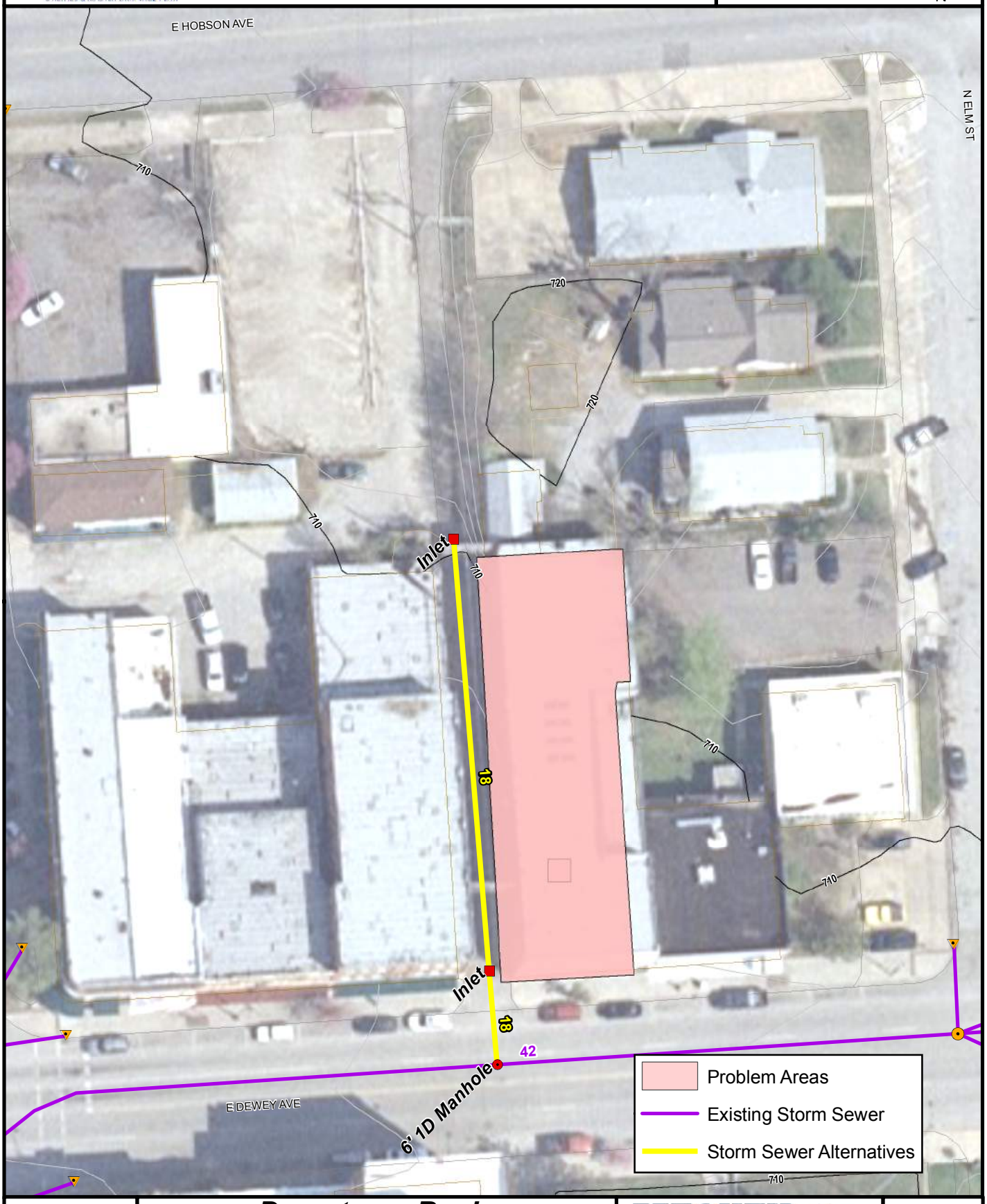
Figure 4-13

City of Sapulpa Master Drainage Plan



Downtown Basin Problem Area 4 Alternative 1

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Figure 4-14

drain into new pipes installed from the Lincoln Avenue alley west to Oak Street and then south on Oak Street to McKinley Avenue and finally to the alley west of McKinley Avenue. This new line would replace the existing 18-inch pipe in this area. Because of the greater capacity of the upsizing of the replacement storm sewer system, this alternative would be dependent on the construction of one of the downstream alternatives for Problem Area 6 described below.

The cost for this improvement would be approximately $385,000 and can be viewed in **Figure 4-15**.

F. Problem Area 6: 302 E. McKinley Avenue

The flooding problems at the intersection of McKinley Avenue and Elm Street are also related to inlet and pipe inadequacies. The stormwater overflows the inlets at the alley east of Elm as well as those at the intersection itself. South of the intersection, localized stormwater, in addition to any overflow, stands on the properties on both sides of Elm Street due to a lack of inlets.

Alternative 1 –Replace the storm sewer pipe with a 20% annual chance system (5-year) to connect to the alternatives described for Problem Area 1 Alternatives 2, 3 and 4. This alternative would align the replaced storm sewer system west on McKinley Avenue to the low point on Elm Street. At that location, inlets would be installed and all stormwater would be directed into the 66-inch pipe west of Elm Street.

The pipe from the alley between Oak and Elm Streets to the intersection at Elm Street and McKinley Avenue would be a 30-inch RCP and the pipe from the intersection south to the low point on Elm and then to the 66-inch pipe would be a 36-inch RCP. This alternative would alleviate the flooding at the intersection and across the property at 301 S. Elm and as well as mitigate the standing water to the south.

This alternative would cost approximately $323,000 and is shown in **Figure 4-16**.

Alternative 2 – Replace the storm sewer pipe with a 20% annual chance system (5-year) to connect to the upgraded trunk line described in Problem Area 1 Alternative 1. This alternative is included in the alternative evaluations for the trunk line system. In this case, new storm sewer inlets and pipe would be installed from the alley between Oak and Elm Streets to the junction box east of the intersection at McKinley Avenue and Elm Street.

The pipe from the alley to the intersection would be a 30-inch RCP, and the pipe from the alley to the junction box at the trunk line would be a 36-inch RCP. New inlets and connecting pipes would be installed on all four corners at McKinley Avenue and Elm Street as well as a new trench grate and 18-inch pipe at the alley on the north side McKinley Avenue.

Similar to Alternative 1, this alternative would alleviate flooding at the intersection and the flow crossing the property at 301 S. Elm; however, it would not address the standing water to the south.

This is estimated to cost $258,000 and is depicted in **Figure 4-17**.

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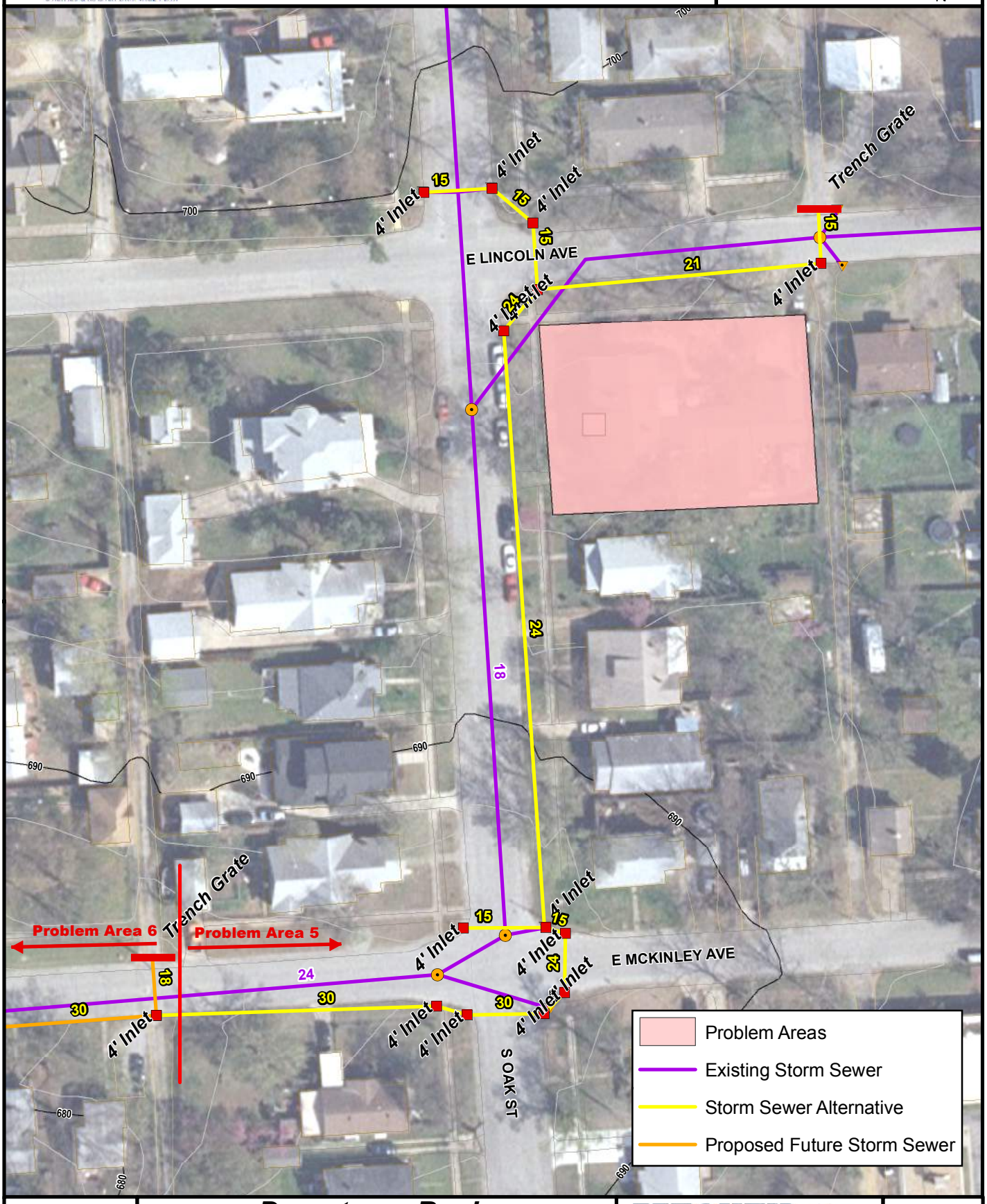

Downtown Basin
Problem Area 5
Alternative 1

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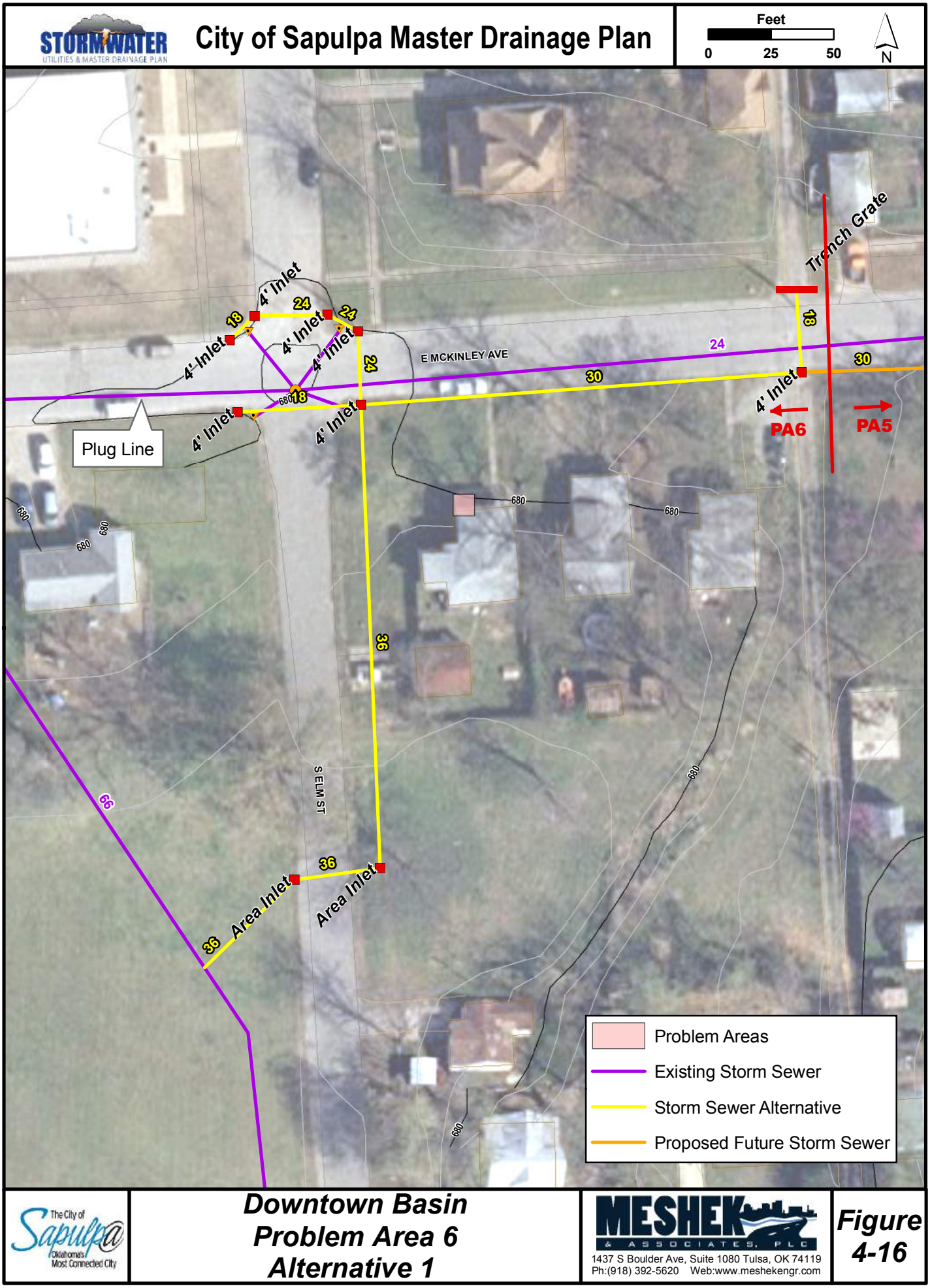
Figure 4-15


STORMWATER
UTILITIES & MASTER DRAINAGE PLAN
City of Sapulpa Master Drainage Plan
Feet
0
25
50
N
Trench Grate
4' Inlet
4' Inlet
4' Inlet
4' Inlet
4' Inlet
4' Inlet
4' Inlet
18
24
24
24
18
18
24
30
30
36
36
66
E MCKINLEY AVE
S ELM ST
Plug Line
PA6
PA5
Area Inlet
Area Inlet
680
Problem Areas
Existing Storm Sewer
Storm Sewer Alternative
Proposed Future Storm Sewer
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Downtown Basin
Problem Area 6
Alternative 1
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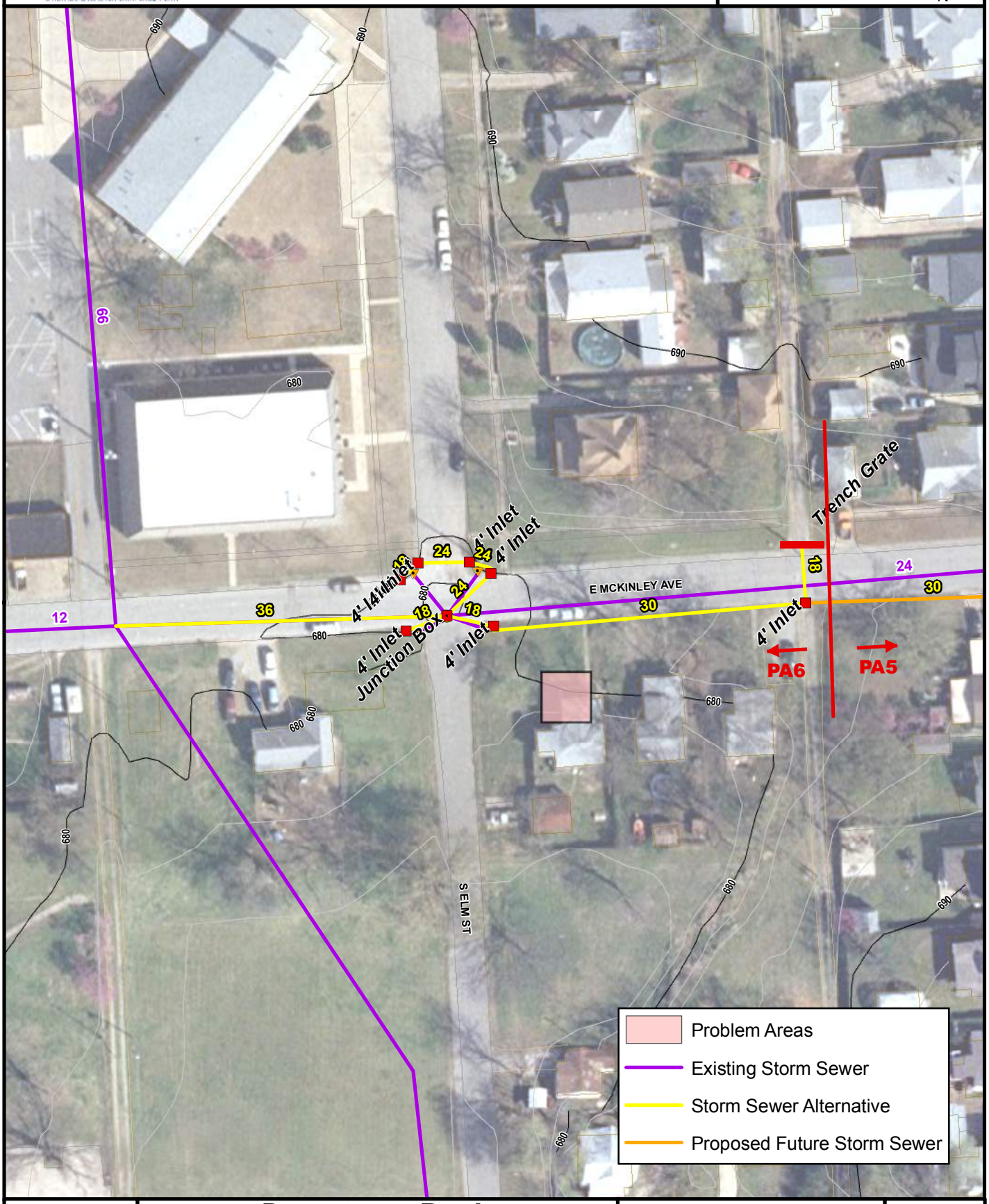
Figure 4-16

City of Sapulpa Master Drainage Plan

STORMWATER UTILITIES & MASTER DRAINAGE PLAN

Feet
0 37.5 75
N



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Downtown Basin
Problem Area 6
Alternative 2

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Figure 4-17

Voluntary Floodplain Acquisition Program – The acquisition of flood-prone residences south of Cleveland Avenue along Park, Water and Elm Streets. In addition to the above alternatives, a voluntary floodplain acquisition program is proposed for those houses located in the downstream portion of the basin. After the full implementation of the above alternatives, approximately 22 residences, located south of Cleveland Avenue along Park, Water and Elm Streets, would still be subject to flooding from storm events with a 1% annual chance frequency.

Because the federal government participates with local communities to acquire flood-prone properties, this program is very beneficial to the local community. First, the federal government provides grants with matching funds up to 75% of the acquisition and demolition costs for properties which meet certain eligibility standards. This means that the local government is only responsible for 25% of the total acquisition and demolition costs. Generally, local in-kind services can be used to defray part or all 25% of the match required for local participation. As a result, this is a very cost-effective solution for a local community to reduce its flood losses to properties and lives.

In addition, since this program is limited to voluntary participation by the property owners, it is usually met with owner and community cooperation and support. At any point during the acquisition process, the local homeowner can opt out of the program with no repercussions.

Finally, voluntary acquisition can result in long-term community benefits by providing additional public open space for passive and active recreation when enough continuous properties participate in the program.

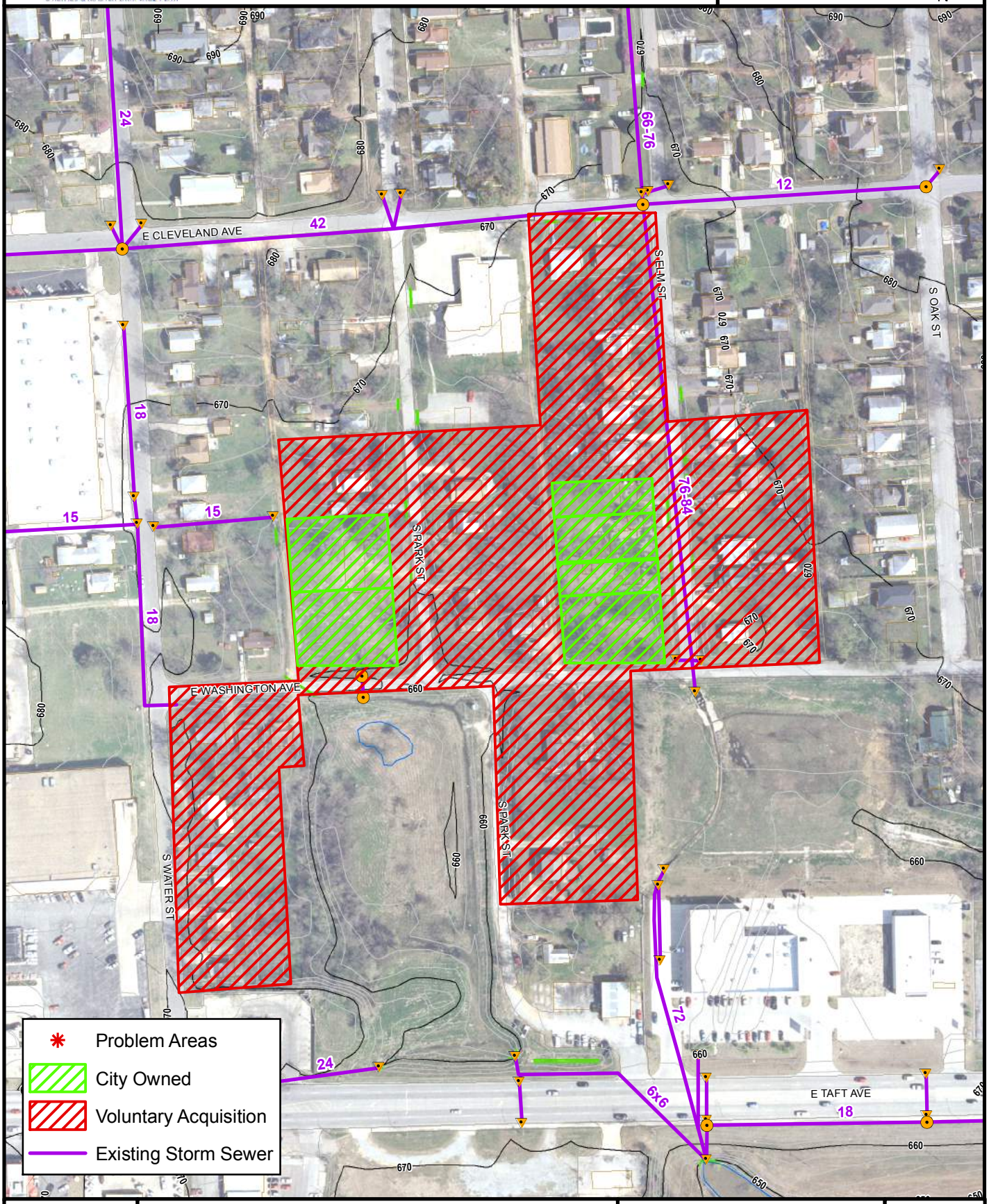
Under a prior review, several of these houses were already determined to meet minimum federal requirements for grant participation. However, in the interim, the federal government has modified its software program for determining project eligibility. Because of this, all houses will need to be re-evaluated before this alternative can be actively pursued.

The area identified for voluntary acquisition is shown in **Figure 4-18**; it is estimated that the voluntary acquisition of the houses in this area would cost $3,000,000. This estimate is based upon the Creek County Assessor Data and includes the costs for acquisition, demolition, administration and grant application.

STORMWATER
UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

Feet
0 100 200
N



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Downtown Basin Floodplain Buyout Program

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Figure 4-18

4.5. RECOMMENDED PLAN

Using prioritization criteria identified in the **INTRODUCTION SECTION 1** and through discussions with City staff, the following alternatives were selected as the Recommended Plan for the Downtown Drainage Basin. Detailed information and exhibits for each of these alternatives can be found in **SECTION 4-4 EVALUATION OF ALTERNATIVES,** and cost estimates are located in **APPENDIX 4-F**.

The Recommended Plan for the Downtown Drainage Basin is:

PROBLEM AREA	RECOMMENDED ALTERNATIVE	RATIONALE FOR SELECTION	ESTIMATED COST
Problem Area 1	Alternative 4	Like all three alternatives, Alternative 4 includes the construction of the upstream detention near the railroad and several other components. In addition, it provides a similar level of public protection at the lowest public cost.	$4,273,000
Problem Area 2	Alternative 2	Alternative 2 is similar in protection and components to Alternative 1 except it would cost less and would include an upstream stormwater detention pond.	$756,000
Problem Area 3	Alternative 1	The major advantage to this alternative is the ease with which it can be funded and constructed in phases. As it is constructed, its cost can be subtracted from the recommended plan for the main trunk line and thereby reduce the overall cost of the trunk line. In the interim, it also provides benefits by improving the localized drainage.	$2,347,000
Problem Area 4	Alternative 1	This alternative is inexpensive, easy to implement and will improve localized drainage. In addition, it encourages future development of the area to the north by recommending private drainage improvements without additional cost to the public.	$24,700
Problem Area 5	Alternative 1	This alternative would upgrade and replace an aging storm sewer that has been a long-term problem, improve localized drainage and improve access for	$385,000

		collector streets during heavy rains.	
Problem Area 6	Alternative 1	In contrast to Alternative 2, this alternative would eliminate the flooding at the intersection of Elm Street and McKinley Avenue and across private property as well as mitigate the standing water to the south.	$323,000
Voluntary Floodplain Acquisition	South of Cleveland Avenue along Park, Water and Elm Streets	After the full implementation of the above alternatives, approximately 22 residences in the downstream portion of the Downtown Basin would still flood from storm events with a 1% annual chance frequency. Because the federal government participates with local communities to acquire flood-prone properties, this program can be implemented at a very low cost to the local community and benefit local residents wanting out of life-threatening conditions.	$3,000,000
		TOTAL COST	**$11,108,700**

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		1345																		
DTN-01	Overland			0.00	0.00			Pasture: Good Condition	2	39	61	74	80	0.0	0.3	1.9	0.0	80.8	8.7	0.01360
	Channel (ditch)	459	3.78	2.91	2.63			Residential 1/4 acre	98	61	75	83	87	0.0	24.4	73.4	0.0			
	Paved	199	0.25	0.99	3.34															
	Pipe	687	0.44	4.00	2.86															
	Stream			0.00	0.00	5.3	0.09													
		1104																		
DTN-02	Overland			0.00	0.00			Commercial	0	89	92	94	95	0.0	0.0	0.0	0.0	75.1	10.5	0.01637
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	100	61	75	83	87	0.0	99.4	0.6	0.0			
	Paved	728	3.09	3.51	3.46															
	Pipe	376	1.12	4.00	1.57															
	Stream			0.00	0.00	3.0	0.05													
		529																		
DTN-02-01	Overland			0.00	0.00			Residential 1/4 acre	100	61	75	83	87	0.0	100.0	0.0	0.0	75.0	0.9	0.00145
	Channel (ditch)			0.00	0.00															
	Paved	529	2.65	3.25	2.71															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.6	0.03													
		1399																		
DTN-02-02	Overland			0.00	0.00			Commercial	21	89	92	94	95	0.0	3.4	17.3	0.0	79.1	9.0	0.01404
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	79	61	75	83	87	0.0	75.9	3.4	0.0			
	Paved	543	1.82	2.69	3.36															
	Pipe	856	1.48	4.00	3.57															
	Stream			0.00	0.00	4.2	0.07													
		520																		
DTN-02-03	Overland			0.00	0.00			Commercial	98	89	92	94	95	0.0	84.1	13.7	0.0	91.9	2.9	0.00459
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	2	61	75	83	87	0.0	2.0	0.1	0.0			
	Paved	520	3.08	3.50	2.47															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.5	0.02													
		402																		
DTN-02-04	Overland			0.00	0.00			Commercial	65	89	92	94	95	0.0	1.2	63.5	0.0	87.5	2.3	0.00366
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	35	61	75	83	87	0.0	32.4	2.9	0.0			
	Paved			0.00	0.00															
	Pipe	402	1.19	4.00	1.67															
	Stream			0.00	0.00	1.0	0.02													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		464																		
DTN-02-05	Overland			0.00	0.00			Commercial	51	89	92	94	95	0.0	0.0	51.1	0.0	85.7	3.0	0.00469
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	49	61	75	83	87	0.0	36.4	12.5	0.0			
	Paved	464	2.26	3.00	2.58															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.5	0.03													
		794																		
DTN-02-06	Overland			0.00	0.00			Commercial	27	89	92	94	95	0.0	0.0	26.7	0.0	85.9	4.6	0.00720
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	73	61	75	83	87	0.0	0.0	73.3	0.0			
	Paved	646	1.66	2.57	4.20															
	Pipe	148	2.23	4.00	0.62															
	Stream			0.00	0.00	2.9	0.05													
		642																		
DTN-02-07	Overland			0.00	0.00			Commercial	78	89	92	94	95	0.0	0.0	78.1	0.0	91.6	4.9	0.00760
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	22	61	75	83	87	0.0	0.0	21.9	0.0			
	Paved	485	1.96	2.79	2.90															
	Pipe	157	1.91	4.00	0.65															
	Stream			0.00	0.00	2.1	0.04													
		988																		
DTN-02-08	Overland			0.00	0.00			Commercial	73	89	92	94	95	0.0	0.0	73.3	0.0	91.1	8.5	0.01335
	Channel (ditch)	337	1.54	1.84	3.05			Residential 1/4 acre	27	61	75	83	87	0.0	0.0	26.7	0.0			
	Paved	217	1.80	2.67	1.35															
	Pipe	434	0.92	4.00	1.81															
	Stream			0.00	0.00	3.7	0.06													
		652																		
DTN-02-09	Overland			0.00	0.00			Commercial	78	89	92	94	95	0.0	0.0	78.4	0.0	91.6	4.6	0.00723
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	22	61	75	83	87	0.0	0.0	21.6	0.0			
	Paved	587	1.82	2.69	3.64															
	Pipe	65	1.22	4.00	0.27															
	Stream			0.00	0.00	2.3	0.04													
		652																		
DTN-02-10	Overland			0.00	0.00			Commercial	0	89	92	94	95	0.0	0.0	0.3	0.0	83.0	3.0	0.00473
	Channel (ditch)	471	2.66	2.44	3.23			Residential 1/4 acre	100	61	75	83	87	0.0	0.0	99.7	0.0			
	Paved			0.00	0.00															
	Pipe	180	0.56	4.00	0.75															
	Stream			0.00	0.00	2.4	0.04													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		914																		
DTN-02-11	Overland			0.00	0.00			Pasture: Good Condition	3	39	61	74	80	0.0	0.0	0.0	3.4	83.8	5.8	0.00908
	Channel (ditch)	164	16.62	6.21	0.44			Residential 1/4 acre	97	61	75	83	87	0.0	0.0	73.8	22.8			
	Paved	689	4.67	4.33	2.65															
	Pipe	61	1.15	4.00	0.25															
	Stream			0.00	0.00	2.0	0.03													
		980																		
DTN-02-12	Overland			0.00	0.00			Commercial	3	89	92	94	95	0.0	0.0	3.4	0.0	84.9	4.6	0.00722
	Channel (ditch)	671	4.11	3.04	3.68			Pasture: Good Condition	19	39	61	74	80	0.0	0.0	0.0	19.4			
	Paved			0.00	0.00			Residential 1/4 acre	77	61	75	83	87	0.0	0.0	25.5	51.7			
	Pipe	309	1.50	4.00	1.29															
	Stream			0.00	0.00	3.0	0.05													
		814																		
DTN-02-13	Overland			0.00	0.00			Commercial	56	89	92	94	95	0.0	0.0	6.7	48.8	91.1	7.4	0.01153
	Channel (ditch)	339	6.81	3.94	1.43			Residential 1/4 acre	42	61	75	83	87	0.0	0.0	2.1	40.2			
	Paved	327	3.06	3.49	1.56			Pasture: Good Condition	2	39	61	74	80	0.0	0.0	0.0	2.1			
	Pipe	148	1.01	4.00	0.62															
	Stream			0.00	0.00	2.2	0.04													
		694																		
DTN-03	Overland			0.00	0.00			Residential 1/4 acre	100	61	75	83	87	0.0	94.2	5.8	0.0	75.5	8.1	0.01267
	Channel (ditch)	303	3.48	2.79	1.81															
	Paved			0.00	0.00															
	Pipe	391	3.07	4.00	1.63															
	Stream			0.00	0.00	2.1	0.03													
		770																		
DTN-04	Overland			0.00	0.00			Commercial	48	89	92	94	95	0.0	3.3	45.1	0.0	87.9	6.8	0.01069
	Channel (ditch)	344	4.57	3.21	1.79			Residential 1/4 acre	52	61	75	83	87	0.0	4.7	46.9	0.0			
	Paved	191	1.99	2.81	1.13															
	Pipe	235	0.09	4.00	0.98															
	Stream			0.00	0.00	2.3	0.04													
		722																		
DTN-04-01	Overland			0.00	0.00			Residential 1/4 acre	100	61	75	83	87	0.0	18.8	81.2	0.0	81.5	6.9	0.01078
	Channel (ditch)	722	1.57	1.86	6.47															
	Paved			0.00	0.00															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	3.9	0.06													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		619																		
DTN-04-02	Overland			0.00	0.00			Residential 1/4 acre	100	61	75	83	87	0.0	0.0	100.0	0.0	83.0	4.5	0.00711
	Channel (ditch)	365	2.85	2.52	2.41															
	Paved			0.00	0.00															
	Pipe	254	0.08	4.00	1.06															
	Stream			0.00	0.00	2.1	0.03													
		836																		
DTN-04-03	Overland			0.00	0.00			Commercial	34	89	92	94	95	0.0	0.0	33.9	0.0	86.7	3.5	0.00549
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	66	61	75	83	87	0.0	0.0	66.1	0.0			
	Paved	836	3.11	3.52	3.95															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.4	0.04													
		553																		
DTN-04-04	Overland			0.00	0.00			Commercial	58	89	92	94	95	0.0	0.0	57.5	0.0	89.3	3.7	0.00571
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	42	61	75	83	87	0.0	0.0	42.5	0.0			
	Paved	339	4.12	4.06	1.39															
	Pipe	214	0.94	4.00	0.89															
	Stream			0.00	0.00	1.4	0.02													
		471																		
DTN-04-05	Overland			0.00	0.00			Commercial	21	89	92	94	95	0.0	13.5	7.2	0.0	78.7	1.7	0.00269
	Channel (ditch)	148	6.56	3.86	0.64			Residential 1/4 acre	79	61	75	83	87	0.0	78.8	0.6	0.0			
	Paved	323	1.33	2.30	2.34															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.8	0.03													
		764																		
DTN-05	Overland			0.00	0.00			Commercial	62	89	92	94	95	0.0	0.0	61.8	0.0	89.8	5.7	0.00897
	Channel (ditch)	335	3.78	2.91	1.92			Residential 1/4 acre	38	61	75	83	87	0.0	0.0	38.2	0.0			
	Paved	180	3.06	3.49	0.86															
	Pipe	249	1.53	0.00	0.00															
	Stream			0.00	0.00	1.7	0.03													
		512																		
DTN-05-01	Overland			0.00	0.00			Commercial	91	89	92	94	95	0.0	71.6	19.5	0.0	90.9	2.6	0.00400
	Channel (ditch)			0.00	0.00			Residential 1/4 acre	9	61	75	83	87	0.0	8.7	0.2	0.0			
	Paved	512	3.38	3.68	2.32															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.4	0.02													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		393																		
DTN-06	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	2.5	0.00394
	Channel (ditch)			0.00	0.00															
	Paved	294	2.14	2.92	1.68															
	Pipe	99	0.20	0.00	0.00															
	Stream			0.00	0.00	1.0	0.02													
		550																		
DTN-06-01	Overland			0.00	0.00			Commercial	76	89	92	94	95	0.0	0.0	75.7	0.0	91.3	2.6	0.00412
	Channel (ditch)	301	4.21	3.08	1.63			Residential 1/4 acre	24	61	75	83	87	0.0	0.0	24.3	0.0			
	Paved	250	1.42	2.37	1.75															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.0	0.03													
		630																		
DTN-07	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	29.1	70.9	0.0	93.4	4.8	0.00743
	Channel (ditch)	486	4.03	3.01	2.69															
	Paved			0.00	0.00															
	Pipe	144	0.69	0.00	0.00															
	Stream			0.00	0.00	1.6	0.03													
		686																		
DTN-08	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	4.9	0.00770
	Channel (ditch)			0.00	0.00															
	Paved	567	1.48	2.43	3.89															
	Pipe	120	0.75	0.00	0.00															
	Stream			0.00	0.00	2.3	0.04													
		743																		
DTN-08-01	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	2.4	97.6	0.0	94.0	6.4	0.01001
	Channel (ditch)			0.00	0.00															
	Paved	644	2.33	3.05	3.52															
	Pipe	98	1.73	0.00	0.00															
	Stream			0.00	0.00	2.1	0.04													
		681																		
DTN-08-02	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	94.6	5.4	94.1	3.8	0.00595
	Channel (ditch)			0.00	0.00															
	Paved	563	3.73	3.86	2.43															
	Pipe	119	1.69	0.00	0.00															
	Stream			0.00	0.00	1.5	0.02													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
DTN-09		699																		
	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	7.7	0.01202
	Channel (ditch)			0.00	0.00															
	Paved	699	0.80	1.78	6.55															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	3.9	0.07													
DTN-09-01		476																		
	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	1.9	0.00292
	Channel (ditch)			0.00	0.00															
	Paved	476	2.98	3.45	2.30															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.4	0.02													
DTN-09-02		707																		
	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	3.6	0.00564
	Channel (ditch)			0.00	0.00															
	Paved	631	1.51	2.45	4.30															
	Pipe	76	0.26	0.00	0.00															
	Stream			0.00	0.00	2.6	0.04													
DTN-09-03		562																		
	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	4.9	0.00762
	Channel (ditch)			0.00	0.00															
	Paved	562	1.21	2.19	4.28															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.6	0.04													
DTN-09-04		719																		
	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	5.2	0.00812
	Channel (ditch)			0.00	0.00															
	Paved	719	1.53	2.46	4.86															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.9	0.05													
DTN-09-05		699																		
	Overland			0.00	0.00			Commercial	53	89	92	94	95	0.0	0.0	52.5	0.0	92.6	6.1	0.00961
	Channel (ditch)			0.00	0.00			Industrial	47	81	88	91	93	0.0	0.0	47.5	0.0			
	Paved	699	1.94	2.78	4.19															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.5	0.04													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		472																		
DTN-09-06	Overland			0.00	0.00			Commercial	81	89	92	94	95	0.0	0.0	81.0	0.0	90.3	3.8	0.00590
	Channel (ditch)	208	4.17	3.06	1.13			Industrial	0	81	88	91	93	0.0	0.0	0.5	0.0			
	Paved	159	0.63	1.58	1.68			Pasture: Good Condition	19	39	61	74	80	0.0	0.0	18.5	0.0			
	Pipe	106	2.46	0.00	0.00															
	Stream			0.00	0.00	1.7	0.03													
		574																		
DTN-09-07	Overland			0.00	0.00			Industrial	99	81	88	91	93	0.0	0.0	62.7	36.2	91.5	1.2	0.00192
	Channel (ditch)	574	4.48	3.18	3.01			Pasture: Good Condition	1	39	61	74	80	0.0	0.0	1.1	0.0			
	Paved			0.00	0.00															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.8	0.03													
		938																		
DTN-09-08	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	100.0	0.0	94.0	8.7	0.01363
	Channel (ditch)			0.00	0.00															
	Paved	345	2.03	2.84	2.03															
	Pipe	593	2.53	0.00	0.00															
	Stream			0.00	0.00	1.2	0.02													
		671																		
DTN-09-09	Overland			0.00	0.00			Commercial	100	89	92	94	95	0.0	0.0	35.3	64.7	94.6	3.6	0.00558
	Channel (ditch)			0.00	0.00															
	Paved	586	3.55	3.77	2.59															
	Pipe	84	2.61	0.00	0.00															
	Stream			0.00	0.00	1.6	0.03													
		574																		
DTN-09-10	Overland			0.00	0.00			Commercial	94	89	92	94	95	0.0	0.0	0.0	93.9	94.5	3.3	0.00520
	Channel (ditch)	135	9.25	4.61	0.49			Residential 1/4 acre	6	61	75	83	87	0.0	0.0	0.0	6.1			
	Paved	356	2.47	3.14	1.89															
	Pipe	83	2.77	0.00	0.00															
	Stream			0.00	0.00	1.4	0.02													
		651																		
DTN-10	Overland			0.00	0.00			Commercial	77	89	92	94	95	0.0	0.0	77.1	0.0	93.3	6.0	0.00943
	Channel (ditch)	278	3.69	2.88	1.61			Industrial	23	81	88	91	93	0.0	0.0	22.9	0.0			
	Paved	281	1.25	2.22	2.10															
	Pipe	92	1.63	4.00	0.38															
	Stream			0.00	0.00	2.5	0.04													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		644																		
DTN-10-01	Overland			0.00	0.00			Commercial	40	89	92	94	95	0.0	0.0	40.4	0.0	92.2	4.4	0.00693
	Channel (ditch)	372	2.51	2.36	2.62			Industrial	59	81	88	91	93	0.0	0.0	59.1	0.0			
	Paved	271	2.06	2.87	1.58			Impervious	1	98	98	98	98	0.0	0.0	0.5	0.0			
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.5	0.04													
		1346																		
DTN-10-02	Overland			0.00	0.00			Commercial	22	89	92	94	95	0.0	0.0	0.9	21.3	83.7	7.4	0.01154
	Channel (ditch)	923	2.82	2.51	6.13			Industrial	1	81	88	91	93	0.0	0.0	1.2	0.0			
	Paved	325	1.41	2.37	2.29			Impervious	8	98	98	98	98	0.0	0.0	6.8	1.1			
	Pipe	98	1.12	4.00	0.41			Pasture: Good Condition	33	39	61	74	80	0.0	7.1	14.5	11.6			
	Stream			0.00	0.00	5.3	0.09	Residential 1 acre	34	51	68	79	84	0.0	2.5	0.1	31.3			
								Residential 1/4 acre	2	61	75	83	87	0.0	0.0	0.0	1.7			
		224																		
DTN-11	Overland			0.00	0.00			Commercial	22	89	92	94	95	0.0	0.0	21.7	0.0	91.7	1.1	0.00177
	Channel (ditch)	224	5.90	3.66	1.02			Industrial	78	81	88	91	93	0.0	0.0	78.3	0.0			
	Paved			0.00	0.00															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	0.6	0.01													
		1391																		
DTN-12	Overland			0.00	0.00			Pasture: Good Condition	35	39	61	74	80	0.0	2.0	14.3	18.7	86.4	14.7	0.02293
	Channel (ditch)	209	1.08	1.54	2.27			Industrial	59	81	88	91	93	0.0	2.8	49.0	6.9			
	Paved			0.00	0.00			Impervious	6	98	98	98	98	0.0	0.4	1.7	4.2			
	Pipe	192	0.52	0.00	0.00															
	Stream	989	0.81	0.00	0.00	1.4	0.02													
		1054																		
DTN-12-01	Overland			0.00	0.00			Commercial	0	89	92	94	95	0.0	0.0	0.1	0.0	91.6	9.4	0.01471
	Channel (ditch)	1054	1.67	1.92	9.15			Industrial	99	81	88	91	93	0.0	0.0	72.1	27.2			
	Paved			0.00	0.00			Impervious	1	98	98	98	98	0.0	0.0	0.0	0.6			
	Pipe			0.00	0.00															
	Stream			0.00	0.00	5.5	0.09													
		422																		
DTN-12-02	Overland			0.00	0.00			Pasture: Good Condition	43	39	61	74	80	0.0	0.0	22.4	20.7	85.6	4.7	0.00731
	Channel (ditch)	422	2.75	2.48	2.84			Industrial	50	81	88	91	93	0.0	0.0	38.6	11.4			
	Paved			0.00	0.00			Impervious	7	98	98	98	98	0.0	0.0	4.3	2.6			
	Pipe			0.00	0.00															
	Stream			0.00	0.00	1.7	0.03													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		1487																		
DTN-13	Overland			0.00	0.00			Commercial	24	89	92	94	95	0.0	0.7	0.0	23.4	86.6	16.7	0.02608
	Channel (ditch)	231	13.27	5.54	0.70			Industrial	0	81	88	91	93	0.0	0.0	0.0	0.0			
	Paved	1256	3.34	3.65	5.73			Impervious	19	98	98	98	98	0.0	0.4	0.0	18.8			
	Pipe			0.00	0.00			Pasture: Good Condition	6	39	61	74	80	0.0	0.0	0.0	5.8			
	Stream			0.00	0.00	3.9	0.06	Residential 1 acre	4	51	68	79	84	0.0	0.0	0.0	3.7			
								Residential 2 acre	44	46	65	77	82	0.0	8.2	0.0	36.1			
								Forest (good cover)	3	25	55	70	77	0.0	0.0	0.0	2.8			
		1706																		
DTN-13-01	Overland			0.00	0.00			Forest (good cover)	51	25	55	70	77	0.0	0.0	0.0	50.6	83.3	21.5	0.03366
	Channel (ditch)	1706	10.85	4.99	5.69			Forest (poor cover)	2	45	66	77	83	0.0	0.0	0.0	2.3			
	Paved			0.00	0.00			Impervious	21	98	98	98	98	0.0	0.0	0.0	21.5			
	Pipe			0.00	0.00			Industrial	15	81	88	91	93	0.0	0.0	0.0	15.1			
	Stream			0.00	0.00	3.4	0.06	Pasture: Good Condition	9	39	61	74	80	0.0	0.0	0.0	9.1			
								Residential 2 acre	1	46	65	77	82	0.0	0.0	0.0	1.4			
		538																		
DTN-13-02	Overland			0.00	0.00			Commercial	10	89	92	94	95	0.0	0.0	0.0	9.9	81.5	1.3	0.00207
	Channel (ditch)	538	2.80	2.50	3.59			Pasture: Good Condition	90	39	61	74	80	0.0	0.0	0.0	90.1			
	Paved			0.00	0.00															
	Pipe			0.00	0.00															
	Stream			0.00	0.00	2.2	0.04													
		680																		
DTN-13-03	Overland			0.00	0.00			Impervious	14	98	98	98	98	0.0	0.0	0.0	13.7	85.6	3.7	0.00573
	Channel (ditch)	491	5.45	3.52	2.33			Pasture: Good Condition	7	39	61	74	80	0.0	0.0	0.0	6.9			
	Paved			0.00	0.00			Residential 1 acre	79	51	68	79	84	0.0	0.0	0.0	79.4			
	Pipe	189	0.79	4.00	0.79															
	Stream			0.00	0.00	1.9	0.03													
		911																		
DTN-13-04	Overland			0.00	0.00			Commercial	2	89	92	94	95	0.0	0.0	0.0	2.3	82.9	8.1	0.01262
	Channel (ditch)	327	16.98	6.28	0.87			Forest (good cover)	37	25	55	70	77	0.0	0.0	0.0	37.0			
	Paved	341	2.78	3.33	1.71			Impervious	16	98	98	98	98	0.0	0.0	0.0	16.2			
	Pipe	243	3.50	4.00	1.01			Pasture: Good Condition	25	39	61	74	80	0.0	0.0	0.0	25.4			
	Stream			0.00	0.00	2.2	0.04	Residential 1 acre	19	51	68	79	84	0.0	0.0	0.0	19.2			
		311																		
DTN-13-05	Overland			0.00	0.00			Forest (good cover)	40	25	55	70	77	0.0	0.0	0.0	39.7	82.6	0.9	0.00148
	Channel (ditch)	311	17.53	6.38	0.81			Impervious	15	98	98	98	98	0.0	0.0	0.0	15.3			
	Paved			0.00	0.00			Pasture: Good Condition	20	39	61	74	80	0.0	0.0	0.0	19.7			
	Pipe			0.00	0.00			Residential 1 acre	25	51	68	79	84	0.0	0.0	0.0	25.4			
	Stream			0.00	0.00	0.5	0.01													

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		2669																		
DTN-13-06	Overland			0.00	0.00			Commercial	12	89	92	94	95	0.0	0.0	0.0	12.0	87.5	13.3	0.02079
	Channel (ditch)	437	2.14	2.18	3.35			Forest (good cover)	0	25	55	70	77	0.0	0.0	0.0	0.2			
	Paved			0.00	0.00			Forest (poor cover)	0	45	66	77	83	0.0	0.0	0.0	0.3			
	Pipe	2232	4.12	4.00	9.30			Impervious	24	98	98	98	98	0.0	0.0	0.0	24.5			
	Stream			0.00	0.00	7.6	0.13	Pasture: Good Condition	30	39	61	74	80	0.0	0.0	0.0	29.9			
								Residential 1 acre	33	51	68	79	84	0.0	0.0	0.0	33.1			
		581																		
DTN-14	Overland			0.00	0.00			Commercial	27	89	92	94	95	0.0	20.2	0.0	6.8	79.0	4.4	0.00692
	Channel (ditch)	581	2.29	2.26	4.29			Forest (good cover)	17	25	55	70	77	0.0	14.1	0.0	2.5			
	Paved			0.00	0.00			Impervious	8	98	98	98	98	0.0	1.3	0.0	6.5			
	Pipe			0.00	0.00			Pasture: Good Condition	20	39	61	74	80	0.0	5.5	0.0	14.7			
	Stream			0.00	0.00	2.6	0.04	Residential 1 acre	28	51	68	79	84	0.0	14.7	0.0	13.5			
								Residential 2 acre	0	46	65	77	82	0.0	0.2	0.0	0.1			
		815																		
DTN-14-01	Overland			0.00	0.00			Commercial	48	89	92	94	95	0.0	0.0	0.0	48.4	87.3	3.8	0.00590
	Channel (ditch)	430	13.34	5.55	1.29			Forest (good cover)	24	25	55	70	77	0.0	0.0	0.0	24.2			
	Paved	385	1.30	2.27	2.83			Impervious	0	98	98	98	98	0.0	0.0	0.0	0.1			
	Pipe			0.00	0.00			Pasture: Good Condition	8	39	61	74	80	0.0	0.0	0.0	7.9			
	Stream			0.00	0.00	2.5	0.04	Residential 1 acre	19	51	68	79	84	0.0	0.0	0.0	19.5			
		1656																		
DTN-15	Overland			0.00	0.00			Commercial	6	89	92	94	95	0.0	0.0	0.0	5.9	78.5	12.6	0.01971
	Channel (ditch)	1656	8.57	4.43	6.23			Forest (good cover)	43	25	55	70	77	0.0	5.0	0.0	38.4			
	Paved			0.00	0.00			Impervious	8	98	98	98	98	0.0	1.7	0.0	6.6			
	Pipe			0.00	0.00			Pasture: Good Condition	34	39	61	74	80	0.0	5.5	0.0	28.1			
	Stream			0.00	0.00	3.7	0.06	Residential 1 acre	9	51	68	79	84	0.0	5.1	0.0	3.8			
		1646																		
DTN-16	Overland			0.00	0.00			Forest (good cover)	50	25	55	70	77	0.0	0.0	0.0	49.7	83.5	10.8	0.01687
	Channel (ditch)	1646	9.24	4.60	5.96			Forest (poor cover)	13	45	66	77	83	0.0	0.0	0.0	12.7			
	Paved			0.00	0.00			Impervious	2	98	98	98	98	0.0	0.0	0.0	2.1			
	Pipe			0.00	0.00			Pasture: Good Condition	3	39	61	74	80	0.0	0.0	0.0	2.6			
	Stream			0.00	0.00	3.6	0.06	Industrial	33	81	88	91	93	0.0	0.0	0.0	32.8			
		1517																		
DTN-17	Overland			0.00	0.00			Commercial	1	89	92	94	95	0.0	0.0	0.0	0.7	84.5	21.1	0.03301
	Channel (ditch)	1517	7.82	4.23	5.98			Forest (good cover)	11	25	55	70	77	0.0	0.0	0.0	10.6			
	Paved			0.00	0.00			Forest (poor cover)	70	45	66	77	83	0.0	0.0	0.0	70.1			
	Pipe			0.00	0.00			Impervious	8	98	98	98	98	0.0	0.0	0.0	7.6			
	Stream			0.00	0.00	3.6	0.06	Industrial	9	81	88	91	93	0.0	0.0	0.0	9.4			
								Pasture: Good Condition	2	39	61	74	80	0.0	0.0	0.0	1.7			

Appendix 4-A. Downtown Drainage Basin - Hydrologic Coefficients for Existing Conditions

Tributary Subarea	Flow Type	Length (ft)	Weighted Slope (%)	Velocity (ft./sec.)	Tc (min.)	Lag (min.)	Lag (hr.)	Land Use:	% of Use	CN value for each Hydrologic Soil Group				Hydrologic Soil Groups and %				Composite CN	Drainage Area (acres)	Drainage Area (sq. mi.)
									1500	A	B	C	D	A	B	C	D		370.0	
		894																		
DTN-18	Overland	83	6.59	1.81	0.77			Commercial	13	89	92	94	95	0.0	0.0	0.0	12.8	82.2	4.5	0.00697
	Channel (ditch)	811	12.79	5.43	2.49			Forest (good cover)	48	25	55	70	77	0.0	0.0	0.0	48.1			
	Paved			0.00	0.00			Forest (poor cover)	4	45	66	77	83	0.0	0.0	0.0	4.4			
	Pipe			0.00	0.00			Impervious	9	98	98	98	98	0.0	0.0	0.0	9.0			
	Stream			0.00	0.00	2.0	0.03	Pasture: Good Condition	26	39	61	74	80	0.0	0.0	0.0	25.6			

Appendix 4-B. Downtown Drainage Basin Existing Flow Rates (CFS)									
HMS Junction	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Drainage Area, mi^2
DTN-01	12	19	31	39	49	56	64	78	0.014
DTN-02	11	19	35	45	58	68	78	96	0.016
DTN-02-01	1	2	3	4	6	6	7	9	0.001
DTN-02-02	11	19	32	41	51	60	67	83	0.014
DTN-02-03	8	13	17	20	24	27	29	34	0.005
DTN-02-04	5	9	13	15	18	21	23	27	0.004
DTN-02-05	6	10	15	19	23	25	28	34	0.005
DTN-02-06	9	15	22	27	33	37	41	49	0.007
DTN-02-07	12	20	28	32	39	43	47	56	0.008
DTN-02-08	20	32	45	52	63	70	77	91	0.013
DTN-02-09	12	19	26	31	36	40	44	52	0.007
DTN-02-10	5	9	14	17	21	24	26	32	0.005
DTN-02-11	11	18	27	33	41	47	52	63	0.009
DTN-02-12	8	14	21	26	32	36	40	48	0.007
DTN-02-13	18	30	41	48	58	64	71	83	0.012
DTN-03	9	16	29	37	47	55	63	78	0.013
DTN-04	15	25	36	42	51	57	64	75	0.011
DTN-04-01	10	17	28	34	43	49	55	67	0.011
DTN-04-02	8	14	21	26	32	36	40	48	0.007
DTN-04-03	7	12	18	21	26	29	32	38	0.005
DTN-04-04	9	15	21	24	29	33	36	42	0.006
DTN-04-05	2	4	7	9	11	13	14	18	0.003
DTN-05	14	23	32	38	46	51	56	66	0.009
DTN-05-01	7	11	15	17	21	23	25	30	0.004
DTN-06	7	12	16	18	21	24	26	30	0.004
DTN-06-01	7	11	15	18	21	23	26	30	0.004
DTN-07	13	21	29	33	39	44	48	56	0.007
DTN-08	14	22	29	34	40	44	48	56	0.008
DTN-08-01	18	29	38	44	52	58	63	74	0.010
DTN-08-02	11	18	23	27	32	35	39	45	0.006
DTN-09	20	31	42	49	58	64	70	83	0.012
DTN-09-01	5	9	12	13	16	17	19	22	0.003
DTN-09-02	10	16	21	24	29	32	35	41	0.006
DTN-09-03	13	21	28	33	39	43	47	55	0.008
DTN-09-04	14	22	30	35	41	45	50	58	0.008
DTN-09-05	16	26	35	41	49	54	59	70	0.010
DTN-09-06	9	15	21	25	30	34	37	44	0.006
DTN-09-07	3	5	7	8	10	11	12	14	0.002
DTN-09-08	25	41	54	62	74	81	89	104	0.014
DTN-09-09	10	17	22	25	30	33	36	42	0.006

Appendix 4-B. Downtown Drainage Basin Existing Flow Rates (CFS)									
HMS Junction	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Drainage Area, mi^2
DTN-09-10	10	16	21	24	28	31	34	40	0.005
DTN-10	16	26	35	41	48	53	58	68	0.009
DTN-10-01	11	18	25	29	35	39	43	50	0.007
DTN-10-02	12	19	29	36	44	50	57	69	0.012
DTN-11	3	5	7	8	9	10	11	13	0.002
DTN-12	30	52	77	92	112	126	139	166	0.023
DTN-12-01	22	32	45	53	63	71	78	93	0.015
DTN-12-02	9	16	24	28	35	39	44	52	0.007
DTN-13	32	52	77	93	113	128	142	170	0.026
DTN-13-01	36	60	93	114	141	160	179	217	0.034
DTN-13-02	2	4	6	7	9	10	11	14	0.002
DTN-13-03	7	12	18	22	27	30	34	40	0.006
DTN-13-04	14	24	37	45	56	63	71	85	0.013
DTN-13-05	2	3	5	6	7	8	9	11	0.001
DTN-13-06	24	35	52	63	77	87	97	117	0.021
DTN-14	6	11	18	22	28	32	36	44	0.007
DTN-14-01	8	13	19	23	28	31	35	41	0.006
DTN-15	16	27	46	58	73	85	96	118	0.020
DTN-16	18	30	47	57	70	80	90	108	0.017
DTN-17	37	61	94	114	140	159	178	214	0.033
DTN-18	7	13	20	25	31	35	39	47	0.007
J-DTN-01	600	871	1296	1566	1907	2161	2413	2930	0.578
J-DTN-02	593	860	1277	1542	1876	2126	2373	2879	0.565
J-DTN-02-01	1	2	3	4	6	6	7	9	0.001
J-DTN-02-02	116	185	272	326	396	446	495	594	0.095
J-DTN-02-03	8	13	17	20	24	27	29	34	0.005
J-DTN-02-04	98	154	224	267	323	363	402	481	0.076
J-DTN-02-05	6	10	15	19	23	25	28	34	0.005
J-DTN-02-06	89	142	206	246	297	333	369	441	0.068
J-DTN-02-07	82	132	189	224	271	304	336	400	0.061
J-DTN-02-08	72	118	170	202	244	273	303	360	0.053
J-DTN-02-09	12	19	26	31	36	40	44	52	0.007
J-DTN-02-10	41	68	100	121	147	166	184	220	0.033
J-DTN-02-11	36	60	88	105	127	143	159	189	0.028
J-DTN-02-12	27	44	63	74	90	101	111	132	0.019
J-DTN-02-13	18	30	41	48	58	64	71	83	0.012
J-DTN-03	474	681	1013	1224	1489	1688	1884	2287	0.452
J-DTN-04	470	674	1000	1206	1466	1661	1853	2245	0.439
J-DTN-04-01	33	56	85	103	127	144	160	193	0.029
J-DTN-04-02	23	39	58	69	85	96	106	127	0.018

Appendix 4-B. Downtown Drainage Basin Existing Flow Rates (CFS)									
HMS Junction	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Drainage Area, mi^2
J-DTN-04-03	7	12	18	21	26	29	32	38	0.005
J-DTN-04-04	9	15	21	24	29	33	36	42	0.006
J-DTN-04-05	2	4	7	9	11	13	14	18	0.003
J-DTN-05	429	620	918	1107	1346	1524	1700	2056	0.397
J-DTN-05-01	7	11	15	17	21	23	25	30	0.004
J-DTN-06	419	606	898	1082	1315	1489	1661	2008	0.384
J-DTN-06-01	7	11	15	18	21	23	26	30	0.004
J-DTN-07	411	596	883	1065	1295	1466	1635	1976	0.376
J-DTN-08	404	586	869	1049	1276	1445	1611	1947	0.368
J-DTN-08-01	29	46	61	71	84	93	101	119	0.016
J-DTN-08-02	11	18	23	27	32	35	39	45	0.006
J-DTN-09	353	527	790	955	1165	1321	1475	1779	0.331
J-DTN-09-01	68	108	147	171	204	226	248	292	0.042
J-DTN-09-02	64	103	139	162	193	214	235	276	0.039
J-DTN-09-03	55	89	120	140	167	185	203	238	0.033
J-DTN-09-04	14	22	30	35	41	45	50	58	0.008
J-DTN-09-05	28	46	63	74	88	98	108	127	0.017
J-DTN-09-06	12	20	28	33	40	44	49	57	0.008
J-DTN-09-07	3	5	7	8	10	11	12	14	0.002
J-DTN-09-08	25	41	54	62	74	81	89	104	0.014
J-DTN-09-09	20	32	42	49	58	64	69	81	0.011
J-DTN-09-10	10	16	21	24	28	31	34	40	0.005
J-DTN-10	251	389	600	733	901	1026	1148	1384	0.266
J-DTN-10-01	22	34	50	60	73	83	92	111	0.018
J-DTN-10-02	12	19	29	36	44	50	57	69	0.012
J-DTN-11	218	344	534	654	805	919	1029	1237	0.239
J-DTN-12	217	342	532	650	801	914	1023	1230	0.237
J-DTN-12-01	22	32	45	53	63	71	78	93	0.015
J-DTN-12-02	9	16	24	28	35	39	44	52	0.007
J-DTN-13	152	248	388	475	587	670	752	911	0.149
J-DTN-13-01	36	60	93	114	141	160	179	217	0.034
J-DTN-13-02	25	36	58	72	84	90	97	115	0.043
J-DTN-13-02-UP	42	62	96	117	144	164	184	224	0.041
J-DTN-13-03	7	12	18	22	27	30	34	40	0.006
J-DTN-13-04	36	51	80	97	120	137	153	187	0.035
J-DTN-13-05	2	3	5	6	7	8	9	11	0.001
J-DTN-13-06	24	35	52	63	77	87	97	117	0.021
J-DTN-13-DN	170	272	427	524	648	741	832	1000	0.192
J-DTN-14	80	133	211	260	322	369	415	504	0.083
J-DTN-14-01	8	13	19	23	28	31	35	41	0.006

Appendix 4-B. Downtown Drainage Basin Existing Flow Rates (CFS)									
HMS Junction	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Drainage Area, mi^2
J-DTN-14-DN	87	143	227	280	347	396	445	540	0.089
J-DTN-15	75	125	197	242	301	344	386	469	0.077
J-DTN-16	53	87	135	164	202	229	257	310	0.050
J-DTN-17	37	61	94	114	140	159	178	214	0.033
J-DTN-18	7	13	20	25	31	35	39	47	0.007
P-DTN-13-02	25	36	58	72	84	90	97	115	0.043
R-DTN-01	593	860	1277	1542	1876	2126	2373	2879	0.565
R-DTN-02	474	681	1013	1224	1489	1688	1884	2287	0.452
R-DTN-02-02	8	13	17	20	24	27	29	34	0.005
R-DTN-02-02-W	98	154	224	267	323	363	402	481	0.076
R-DTN-02-04	6	10	15	19	23	25	28	34	0.005
R-DTN-02-04-W	89	142	206	246	297	333	369	441	0.068
R-DTN-02-06	82	132	189	224	271	304	336	400	0.061
R-DTN-02-07	72	118	170	202	244	273	303	360	0.053
R-DTN-02-08	12	19	26	31	36	40	44	52	0.007
R-DTN-02-08-W	41	68	100	121	147	166	184	220	0.033
R-DTN-02-10	36	60	88	105	127	143	159	189	0.028
R-DTN-02-11	27	44	63	74	90	101	111	132	0.019
R-DTN-02-12	18	30	41	48	58	64	71	83	0.012
R-DTN-02-E	1	2	3	4	6	6	7	9	0.001
R-DTN-02-W	116	185	272	326	396	446	495	594	0.095
R-DTN-03	470	674	1000	1206	1466	1661	1853	2245	0.439
R-DTN-04	429	620	918	1107	1346	1524	1700	2056	0.397
R-DTN-04-01	23	39	58	69	85	96	106	127	0.018
R-DTN-04-02	9	15	21	24	29	33	36	42	0.006
R-DTN-04-02-E	7	12	18	21	26	29	32	38	0.005
R-DTN-04-E	33	56	85	103	127	144	160	193	0.029
R-DTN-04-W	2	4	7	9	11	13	14	18	0.003
R-DTN-05	419	606	898	1082	1315	1489	1661	2008	0.384
R-DTN-05-W	7	11	15	17	21	23	25	30	0.004
R-DTN-06-E	7	11	15	18	21	23	26	30	0.004
R-DTN-06-W	411	596	883	1065	1295	1466	1635	1976	0.376
R-DTN-07	404	586	869	1049	1276	1445	1611	1947	0.368
R-DTN-08	353	527	790	955	1165	1321	1475	1779	0.331
R-DTN-08-01	11	18	23	27	32	35	39	45	0.006
R-DTN-08-E	25	41	54	62	74	81	89	104	0.014
R-DTN-08-W	29	46	61	71	84	93	101	119	0.016
R-DTN-09	251	389	600	733	901	1026	1148	1384	0.266
R-DTN-09-01	64	103	139	162	193	214	235	276	0.039
R-DTN-09-02	55	89	120	140	167	185	203	238	0.033

STORMWATER
UTILITIES & MASTER DRAINAGE PLAN

City of Sapulpa Master Drainage Plan

Feet
0 250 500
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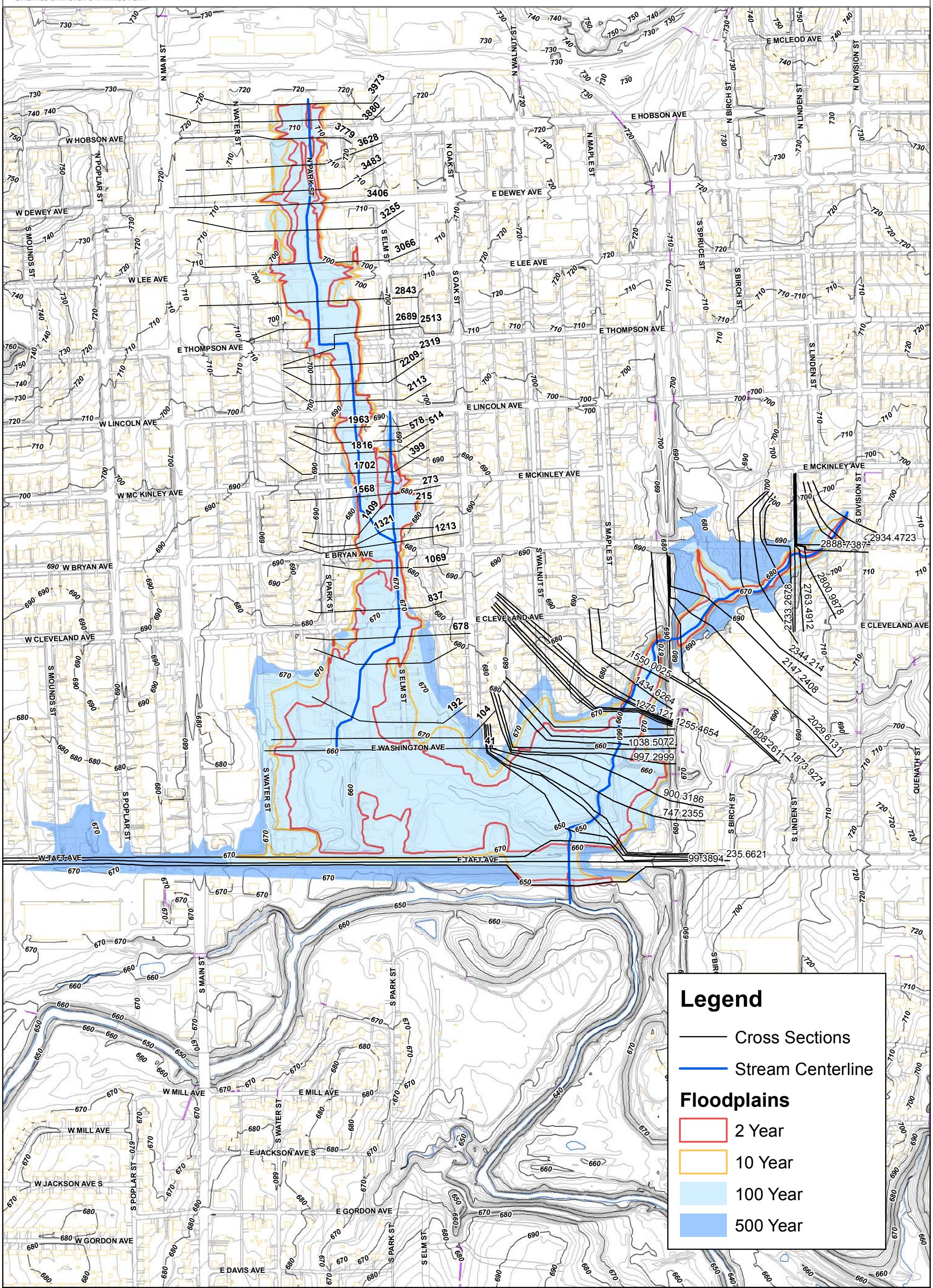

Legend

- Cross Sections
- Stream Centerline

Floodplains

- 2 Year
- 10 Year
- 100 Year
- 500 Year

The City of Sapulpa
Oklahoma's Most Connected City

Downtown Basin
Downtown and High School Floodplains

MESHEK & ASSOCIATES, PLC
1437 S Boulder Ave, Suite 1080 Tulsa, OK 74119
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Appendix 4-C

APPENDIX 4-D - DOWNTOWN DRAINAGE BASIN - STORM SEWER CAPACITY - EXISTING CONDITIONS

Basin	Node	HMS Junction	Downstream Pipe	Length (ft)	Section Size	Full Capacity (cfs)	Capacity	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
DTN-01	DTN-01	J-DTN-01						600	871	1296	1566	1907	2161	2413	2930
DTN-02	DTN-02	J-DTN-02	DTN-P-01	737	81 inch	325	Less Than 1YR	593	860	1277	1542	1876	2126	2373	2879
DTN-02-01	DTN-03	J-DTN-02-01	DTN-P-02	425	12 inch	7	50YR	1	2	3	4	6	6	7	9
DTN-02-02	DTN-04	J-DTN-02-02	DTN-P-02-01	778	42 inch	70	Less Than 1YR	116	185	272	326	396	446	495	594
DTN-02-03	DTN-05	J-DTN-02-03	DTN-P-05	451	15 inch	10	1YR	8	13	17	20	24	27	29	34
DTN-02-04	DTN-06	J-DTN-02-04	DTN-P-04	195	42 inch	40	Less Than 1YR	98	154	224	267	323	363	402	481
DTN-02-05	DTN-07	J-DTN-02-05	DTN-P-07	415	24 inch	13	2YR	6	10	15	19	23	25	28	34
DTN-02-07	DTN-08	J-DTN-02-07	DTN-P-08-02	374	30 inch	37	Less Than 1YR	82	132	189	224	271	304	336	400
DTN-02-06	DTN-08-DN	J-DTN-02-06	DTN-P-06	141	42 inch	52	Less Than 1YR	89	142	206	246	297	333	369	441
DTN-02-08	DTN-09	J-DTN-02-08	DTN-P-08	345	30 inch	37	Less Than 1YR	72	118	170	202	244	273	303	360
DTN-02-09	DTN-10	J-DTN-02-09	DTN-P-09-02	417	18 inch	12	1YR	12	19	26	31	36	40	44	52
DTN-02-10	DTN-11	J-DTN-02-10	DTN-P-09	373	24 inch	25	Less Than 1YR	41	68	100	121	147	166	184	220
DTN-02-11	DTN-12	J-DTN-02-11	DTN-P-11-01	319	21 inch	25	Less Than 1YR	36	60	88	105	127	143	159	189
DTN-02-12	DTN-13	J-DTN-02-12	DTN-P-12-01	320	18 inch	18	Less Than 1YR	27	44	63	74	90	101	111	132
DTN-02-13	DTN-14	J-DTN-02-13	DTN-P-14	61	15 inch	10	Less Than 1YR	18	30	41	48	58	64	71	83
DTN-03	DTN-15	J-DTN-03	DTN-P-02-02	399	72 inch	275	Less Than 1YR	474	681	1013	1224	1489	1688	1884	2287
DTN-04	DTN-16	J-DTN-04	DTN-P-15-02	225	66 inch	250	Less Than 1YR	470	674	1000	1206	1466	1661	1853	2245
DTN-04-01	DTN-17	J-DTN-04-01	DTN-P-16-01	352	24 inch	25	Less Than 1YR	33	56	85	103	127	144	160	193
DTN-04-02	DTN-18	J-DTN-04-02	DTN-P-17-01	296	18 inch	20	Less Than 1YR	23	39	58	69	85	96	106	127
DTN-04-04	DTN-19	J-DTN-04-04	DTN-P-18-01	321	15 inch	20	2YR	9	15	21	24	29	33	36	42
DTN-04-03	DTN-20	J-DTN-04-03	DTN-P-18-02	361	18 inch	8	1YR	7	12	18	21	26	29	32	38
DTN-05	DTN-21	J-DTN-05	DTN-P-16-02	398	66 inch	275	Less Than 1YR	429	620	918	1107	1346	1524	1700	2056
DTN-05-01	DTN-22	J-DTN-05-01	DTN-P-22	200	18 inch	15	5YR	7	11	15	17	21	23	25	30
DTN-06	DTN-23	J-DTN-06	DTN-P-21	387	66 inch	230	Less Than 1YR	419	606	898	1082	1315	1489	1661	2008
DTN-06-01	DTN-24	J-DTN-06-01	DTN-P-24	178	12 inch	7	1YR	7	11	15	18	21	23	26	30
DTN-07	DTN-25	J-DTN-07	DTN-P-23	166	66 inch	210	Less Than 1YR	411	596	883	1065	1295	1466	1635	1976
DTN-08	DTN-26	J-DTN-08	DTN-P-25	367	66 inch	270	Less Than 1YR	404	586	869	1049	1276	1445	1611	1947
DTN-09-08	DTN-27	J-DTN-09-08	DTN-P-27	400	18 inch	6	Less Than 1YR	25	41	54	62	74	81	89	104
DTN-08-01	DTN-28	J-DTN-08-01	DTN-P-28	361	15 inch	8	Less Than 1YR	29	46	61	71	84	93	101	119
DTN-08-02	DTN-29	J-DTN-08-02	DTN-P-29	389	12 inch	6	Less Than 1YR	11	18	23	27	32	35	39	45
DTN-09	DTN-30	J-DTN-09	DTN-P-26	385	66 inch	250	Less Than 1YR	353	527	790	955	1165	1321	1475	1779
DTN-09	DTN-31	J-DTN-09-09	DTN-P-30-01	335	15 inch	8	Less Than 1YR	20	32	42	49	58	64	69	81
DTN-09-09	DTN-32	J-DTN-09-10	DTN-P-31	390	12 inch	7	Less Than 1YR	10	16	21	24	28	31	34	40
DTN-09-09	DTN-33	J-DTN-09-10	DTN-P-33	268	12 inch	7	Less Than 1YR	10	16	21	24	28	31	34	40
DTN-09-02	DTN-34	J-DTN-09-02	DTN-P-30-03	343	42 inch	65	1YR	64	103	139	162	193	214	235	276
DTN-09-03	DTN-35	J-DTN-09-03	DTN-P-34	378	42 inch	55	1YR	55	89	120	140	167	185	203	238
DTN-09-04	DTN-36	J-DTN-09-04	DTN-P-35-01	404	15 inch	5	Less Than 1YR	14	22	30	35	41	45	50	58
DTN-09-05	DTN-37	J-DTN-09-05	DTN-P-35-02	337	36 inch	40	1YR	28	46	63	74	88	98	108	127
DTN-09-06	DTN-38	J-DTN-09-06	DTN-P-37-01	358	12 inch	5	Less Than 1YR	12	20	28	33	40	44	49	57
DTN-10	DTN-39	J-DTN-10	DTN-P-39	29	66 inch	250	Less Than 1YR	251	389	600	733	901	1026	1148	1384
DTN-10-01	DTN-40	J-DTN-10-01	DTN-P-40	361	18 inch	15	Less Than 1YR	22	34	50	60	73	83	92	111
DTN-10-02	DTN-41	J-DTN-10-02	DTN-P-41	394	12 inch	6	Less Than 1YR	12	19	29	36	44	50	57	69
DTN-12-01	DTN-43	J-DTN-12	DTN-P-42	452.71	3 x 3 ft	90	Less Than 1YR	217	342	532	650	801	914	1023	1230
DTN-12-01	DTN-44	J-DTN-13-DN	DTN-P-43	314	3 x 3 ft	190	1YR	170	272	427	524	648	741	832	1000
DTN-13	DTN-45	J-DTN-13-DN	DTN-P-45	47	3 x 3 ft	180	1YR	170	272	427	524	648	741	832	1000
DTN-13-02	DTN-46	J-DTN-13-02	DTN-P-44-03	100	42 inch	95	50YR	25	36	58	72	84	90	97	115
DTN-13-03	DTN-47	J-DTN-13-03	DTN-P-47	273	36 inch	60	500YR	7	12	18	22	27	30	34	40

APPENDIX 4-D - DOWNTOWN DRAINAGE BASIN - STORM SEWER CAPACITY - EXISTING CONDITIONS

Basin	Node	HMS Junction	Downstream Pipe	Length (ft)	Section Size	Full Capacity (cfs)	Capacity	1-Year	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
DTN-13-04	DTN-48	J-DTN-13-04	DTN-P-46	288	36 inch	136	25YR	36	51	80	97	120	137	153	187
DTN-13-05	DTN-49	J-DTN-13-05	DTN-P-49	594	24 inch	29	500YR	2	3	5	6	7	8	9	11
DTN-13-06	DTN-50	J-DTN-13-06	DTN-P-48-03	291	24 inch	55	5YR	24	35	52	63	77	87	97	117
DTN-02-02	DTN-J-01	J-DTN-02-03	DTN-P-04-01	430	24 inch	10	1YR	8	13	17	20	24	27	29	34
DTN-02-02	DTN-J-02	J-DTN-02-03	DTN-P-04-02	343	24 inch	10	1YR	8	13	17	20	24	27	29	34
DTN-02-06	DTN-J-03	J-DTN-02-07	DTN-P-08-01	69	24 inch	37	Less Than 1YR	82	132	189	224	271	304	336	400
DTN-02-08	DTN-J-04	J-DTN-02-09	DTN-P-09-01	420	18 inch	12	1YR	12	19	26	31	36	40	44	52
DTN-02-10	DTN-J-05	J-DTN-02-11	DTN-P-11	51	24 inch	25	Less Than 1YR	36	60	88	105	127	143	159	189
DTN-02-11	DTN-J-06	J-DTN-02-12	DTN-P-12	80	21 inch	18	Less Than 1YR	27	44	63	74	90	101	111	132
DTN-02-12	DTN-J-07	J-DTN-02-13	DTN-P-13	80	18 inch	10	Less Than 1YR	18	30	41	48	58	64	71	83
DTN-02-13	DTN-J-08	J-DTN-02-13	DTN-P-13-01	340	15 inch	10	Less Than 1YR	18	30	41	48	58	64	71	83
DTN-03	DTN-J-09	J-DTN-04	DTN-P-15-01	100	66 inch	250	Less Than 1YR	470	674	1000	1206	1466	1661	1853	2245
DTN-04	DTN-J-10	J-DTN-04-01	DTN-P-16	195	24 inch	25	Less Than 1YR	33	56	85	103	127	144	160	193
DTN-04-01	DTN-J-11	J-DTN-04-02	DTN-P-17	47	24 inch	20	Less Than 1YR	23	39	58	69	85	96	106	127
DTN-04-02	DTN-J-12	J-DTN-04-04	DTN-P-18	122	18 inch	20	2YR	9	15	21	24	29	33	36	42
DTN-09	DTN-J-13	J-DTN-09-09	DTN-P-30	44	15 inch	8	Less Than 1YR	20	32	42	49	58	64	69	81
DTN-09-01	DTN-J-15	J-DTN-09-01	DTN-P-30-02	49	42 inch	65	Less Than 1YR	68	108	147	171	204	226	248	292
DTN-09-03	DTN-J-16	J-DTN-09-05	DTN-P-35	45	36 inch	40	1YR	28	46	63	74	88	98	108	127
DTN-09-04	DTN-J-17	J-DTN-09-04	DTN-P-36	25.77	10 inch	0	Less Than 1YR	14	22	30	35	41	45	50	58
DTN-09-05	DTN-J-18	J-DTN-09-06	DTN-P-37	45	36 inch	5	Less Than 1YR	12	20	28	33	40	44	49	57
DTN-09-06	DTN-J-19	J-DTN-09-06	DTN-P-38	87	12 inch	0	Less Than 1YR	12	20	28	33	40	44	49	57
DTN-09-06	DTN-J-20	J-DTN-09-06	DTN-P-38-01	123	12 inch	0	Less Than 1YR	12	20	28	33	40	44	49	57
DTN-10	DTN-J-21	J-DTN-10	DTN-P-30-04	409	66 inch	250	Less Than 1YR	251	389	600	733	901	1026	1148	1384
DTN-12	DTN-J-22	J-DTN-13-02	DTN-P-44	43.73	42 inch	95	50YR	25	36	58	72	84	90	97	115
DTN-12	DTN-J-23	J-DTN-13-02	DTN-P-44-01	340	42 inch	95	50YR	25	36	58	72	84	90	97	115
DTN-12	DTN-J-24	J-DTN-13-02	DTN-P-44-02	310	42 inch	95	50YR	25	36	58	72	84	90	97	115
DTN-13-04	DTN-J-25	J-DTN-13-05	DTN-P-48	107	24 inch	29	500YR	2	3	5	6	7	8	9	11
DTN-13-04	DTN-J-26	J-DTN-13-05	DTN-P-48-01	57	24 inch	29	500YR	2	3	5	6	7	8	9	11
DTN-13-04	DTN-J-27	J-DTN-13-06	DTN-P-48-02	170	24 inch	55	5YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-29	J-DTN-13-06	DTN-P-50	86	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-30	J-DTN-13-06	DTN-P-50-01	171	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-31	J-DTN-13-06	DTN-P-50-02	376	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-32	J-DTN-13-06	DTN-P-50-03	244	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-33	J-DTN-13-06	DTN-P-50-04	304	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-34	J-DTN-13-06	DTN-P-50-05	185	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-35	J-DTN-13-06	DTN-P-50-06	278	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-36	J-DTN-13-06	DTN-P-50-07	168	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-37	J-DTN-13-06	DTN-P-50-08	289	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-38	J-DTN-13-06	DTN-P-50-09	77	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-13-06	DTN-J-39	J-DTN-13-06	DTN-P-50-10	26	18 inch	10	Less Than 1YR	24	35	52	63	77	87	97	117
DTN-04-04	DTN-J-40		DTN-P-19	201	12 inch	0	Less Than 1YR	4	7	10	12	15	16	18	21
DTN-11	DTN-J-42	J-DTN-11	DTN-P-39-01	190.9	3 x 3 ft	90	Less Than 1YR	218	344	534	654	805	919	1029	1237

Appendix 4-E. 50% (2-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
1	Hobson & Main	DTN-10-02	18.6	**8**	17.3	**0**	0.0	17.3	17.3	0	17.3	6	
1	Hobson & Water	DTN-10-01	18.4	**7**	15.2	**0**	0.0	15.2	15.2	6.0	21.2	15	
2	Hobson & Park	DTN-10	25.9	**8**	17.3	**0**	0.0	17.3	25.9	105.0	130.9	**260**	
3	Hobson & Oak	DTN-09-05	25.8	**8**	17.3	**0**	0.0	17.3	25.8	5.0	30.8	**40**	
3	Hobson & Walnut	DTN-09-06	15.3	**6**	13.0	**0**	0.0	13.0	13.0	0	13.0	**5**	
4	Dewey & Poplar	DTN-09-10	15.5	**9**	19.5	**27**	115.6	135.0	15.5	0	15.5	**7**	
5	Dewey & Main	DTN-09-09	16.6	**4**	8.7	**6**	25.7	34.3	16.6	7.0	23.6	**6**	
5	Dewey & Water				0.0		0.0	0.0	0.0	6.0	6.0	**15**	
	Dewey & Park	DTN-09	31.1										
6	Dewey & Park	DTN-09-01	8.6	**8**	17.3	**0**	0.0	17.3	39.7	201.9	210.5	**250**	DTN-09+DTN-09-01
6	Dewey & Elm	DTN-09-02	15.7	**5**	10.8	**0**	0.0	10.8	10.8	55.0	65.8	**65**	
7	Dewey & Oak	DTN-09-03	21.2	**6**	13.0	**0**	0.0	13.0	21.2	35.8	57.0	**55**	
7	Dewey & Walnut	DTN-09-04	22.2	**7**	15.2	**0**	0.0	15.2	15.2	0	15.2	**5**	
4	Lee & Poplar	DTN-02-13	29.9	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**10**	
5	Lee & Main	DTN-08-02	17.5	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	
5	Lee & Water	DTN-08-01	14.25	**6**	13.0	**0**	0.0	13.0	13.0	6.0	19.0	**8**	N1/2 OF DTN-08-01
6	Lee & Park	DTN-08	21.7	**6**	13.0	**0**	0.0	13.0	21.7	226.5	248.2	**270**	
6	Lee & Elm	DTN-09-08	27	**5**	10.8	**0**	0.0	10.8	10.8	18.0	28.8	**8**	**2/3 OF DTN 09-08**
7	Lee & Oak	DTN-09-08	13.5	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	**1/3 OF DTN 09-08**
8	Thompson & Poplar	DTN-02-12	14.1	**4**	8.7	**0**	0.0	8.7	8.7	8.7	17.3	**18**	
9	Thompson & Main	DTN-02-09	19	**6**	13.0	**1**	4.3	17.3	17.3	0	17.3	**12**	
10	Thompson & Park	DTN-07	21.4	**4**	8.7	**0**	0.0	8.7	21.4	248.2	269.6	**275**	
10	Thompson & Alley between Park & Elm	DTN-06	11.8	**4**	8.7	**0**	0.0	8.7	11.8	276.0	287.8	**275**	
10	Thompson & Elm	DTN-06-01	10.9	**1**	2.2	**1**	4.3	6.4	6.4	0	6.4	**7**	
11	Thompson & Oak	DTN-04-04	7.3	**4**	8.7	**0**	0.0	7.3	7.3	6.0	13.3	**20**	**1/2 OF DTN-04-04**

Appendix 4-E. 50% (2-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
11	Thompson & Alley east of Oak	DTN-04-04	7.3	**2**	4.3	**0**	0.0	7.3	7.3	0	7.3	**6**	**1/2 OF DTN-04-04**
8	Lincoln & Poplar	DTN-02-11	17.9	**4**	8.7	**0**	0.0	8.7	8.7	17.3	26.0	**25**	
9	Lincoln & Main	DTN-02-08	15.95	**4**	8.7	**0**	0.0	8.7	8.7	12	20.7	**12**	**N1/2 OF DTN-02-08**
9	Lincoln & Water	DTN-02-03	12.7	**2**	4.3	**0**	0.0	12.7	12.7	0	12.7	**10**	
10	Lincoln & Park	DTN-05-01	10.8	**6**	13.0	**0**	0.0	13.0	10.8	0	10.8	**15**	
10	Lincoln & alley between Elm & Park	DTN-05	11.45	**10**	21.7	**6**	25.7	47.3	11.5	275.0	286.5	**275**	**12 x 6 RCB to nowhere - W1/2 OF DTN-05**
10	Lincoln & Elm	DTN-05	11.45	**2**	4.3	**0**	0.0	11.5	11.5	0	11.5	**10**	**E1/2 OF DTN-05**
11	Lincoln & Oak	DTN-04-02	6.75	**2**	4.3	**0**	0.0	4.3	4.3	29.3	33.6	**20**	**W1/2 OF DTN-04-02**
11	Lincoln & Alley between Walnut & Oak	DTN-04-02	6.75	**2**	4.3	**0**	0.0	4.3	4.3	8.0	12.3	**8**	**E1/2 OF DTN-04-02**
11	Lincoln & Walnut	DTN-04-03	12	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**8**	
12	McKinley & Poplar	DTN-02-10	8.9	**4**	8.7	**1**	4.3	12.9	8.9	8.7	17.6	**25**	**Accommodates a larger storm**
13	McKinley & Main	DTN-02-08	31.9	**5**	10.8	**0**	0.0	10.8	10.8	23.6	34.4	**37**	
13	McKinley & Water	DTN-02-02	9.65	**4**	8.7	**0**	0.0	8.7	8.7	8.0	16.7	**10**	**N1/2 OF DTN-02-02**
14	McKinley & Park	DTN-04-05	4.2	**2**	4.3	**0**	0.0	4.3	4.2	0	4.2	**10**	
14	McKinley & Alley between Park & Elm	DTN-04	24.7	**0**	0.0	**0**	0.0	0.0	0.0	304.2	304.2	**250**	
14	McKinley & Elm	DTN-04	24.7	**4**	8.7	**0**	0.0	8.7	8.7	20.0	28.7	**25**	
15	McKinley & Oak	DTN-04-04	14.6	**2**	4.3	**0**	0.0	4.3	4.3	20.0	24.3	**20**	
13	Bryan & Main	DTN-02-07	20.1	**3**	6.5	**0**	0.0	6.5	6.5	34.4	40.9	**37**	
13	Bryan & Alley between Main & Water	DTN-02-05	10.4	**8**	17.3	**0**	0.0	17.3	10.4	0.0	10.4	**13**	
13	Bryan & Water	DTN-02-08	7.975	**1**	2.2	**0**	0.0	2.2	2.2	10.0	12.2	**10**	1/4 IF DTN-02-02\
14	Bryan & Park	DTN-03	4.1	**3**	6.5	**0**	0.0	6.5	4.1	0.0	4.1	**10**	W1/4 OF DTN-03
14	Bryan & Alley between Park & Elm	DTN-03	4.1	**4**	8.7	**4**	17.1	25.8	4.1	4.1	8.2	**275**	MIDDLE 1/4 OF DTN-05
14	Bryan & Elm	DTN-03	8.2	**8**	17.3	**8**	34.2	51.6	8.2	258.2	266.4	**275**	E1/2 OF DTN-03
16	Cleveland & Main	DTN-02-06	14.8	**2**	4.3	**0**	0.0	4.3	4.3	37.0	41.3	**52**	
16	Cleveland & Alley between Main & Water	DTN-02-04	8.9	**2**	4.3	**0**	0.0	4.3	4.3	51.7	56.1	**40**	

Appendix 4-E. 50% (2-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
16	Cleveland & Water	DTN-02-02	4.825	**2**	4.3	**0**	0.0	4.3	4.3	50.0	54.3	**70**	S1/4 OF DTN-02-09
17	Cleveland & Park	DTN-02	9.7	**2**	4.3	**0**	0.0	4.3	4.3	54.3	58.7	**70**	W1/2 OF DTN-02
17	Cleveland & Elm	DTN-02	9.7	**3**	6.5	**0**	0.0	6.5	6.5	327.0	333.5	**325**	E1/2 PF DTN-02
18	Cleveland & Oak	DTN-02-01	1.9	**1**	2.2	**0**	0.0	2.2	1.9	0.0	1.9	**7**	
19	Washington & Elm	DTN-01	19.1	**3**	6.5	**0**	0.0	6.5	6.5	325.0	331.5	**325**	

Appendix 4-E. 20% (5-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
1	Hobson & Main	DTN-10-02	29.2	**8**	17.3	**0**	0.0	17.3	17.3	0	17.3	6	
1	Hobson & Water	DTN-10-01	25.1	**7**	15.2	**0**	0.0	15.2	15.2	6.0	21.2	15	
2	Hobson & Park	DTN-10	34.8	**8**	17.3	**0**	0.0	34.8	34.8	105.0	139.8	**260**	
3	Hobson & Oak	DTN-09-05	35.1	**8**	17.3	**0**	0.0	35.1	35.1	5.0	40.1	**40**	
3	Hobson & Walnut	DTN-09-06	21.4	**6**	13.0	**0**	0.0	13.0	13.0	0	13.0	**5**	
4	Dewey & Poplar	DTN-09-10	20.5	**9**	19.5	**27**	115.6	135.0	20.5	0	20.5	**7**	
5	Dewey & Main	DTN-09-09	21.9	**4**	8.7	**6**	25.7	34.3	21.9	7.0	28.9	**6**	
5	Dewey & Water				0.0		0.0	0.0	0.0	6.0	6.0	**15**	
	Dewey & Park	DTN-09	41.9										
6	Dewey & Park	DTN-09-01	11.5	**8**	17.3	**0**	0.0	53.4	53.4	210.8	222.3	**250**	DTN-09+DTN-09-01
6	Dewey & Elm	DTN-09-02	21	**5**	10.8	**0**	0.0	21.0	21.0	55.0	76.0	**65**	
7	Dewey & Oak	DTN-09-03	28.4	**6**	13.0	**0**	0.0	13.0	13.0	45.0	58.0	**55**	
7	Dewey & Walnut	DTN-09-04	29.8	**7**	15.2	**0**	0.0	15.2	15.2	0	15.2	**5**	
4	Lee & Poplar	DTN-02-13	41.3	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**10**	
5	Lee & Main	DTN-08-02	23.3	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	
5	Lee & Water	DTN-08-01	19	**6**	13.0	**0**	0.0	13.0	13.0	6.0	19.0	**8**	N1/2 OF DTN-08-01
6	Lee & Park	DTN-08	29	**6**	13.0	**0**	0.0	29.0	29.0	238.3	267.3	**270**	
6	Lee & Elm	DTN-09-08	35.8	**5**	10.8	**0**	0.0	10.8	10.8	18.0	28.8	**8**	**2/3 OF DTN 09-08**
7	Lee & Oak	DTN-09-08	17.9	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	**1/3 OF DTN 09-08**
8	Thompson & Poplar	DTN-02-12	21.4	**4**	8.7	**0**	0.0	8.7	8.7	8.7	17.3	**18**	
9	Thompson & Main	DTN-02-09	26.1	**6**	13.0	**1**	4.3	17.3	17.3	0	17.3	**12**	
10	Thompson & Park	DTN-07	28.7	**4**	8.7	**0**	0.0	8.7	8.7	267.3	276.0	**275**	
10	Thompson & Alley between Park & Elm	DTN-06	15.6	**4**	8.7	**0**	0.0	8.7	8.7	281.4	290.1	**275**	
10	Thompson & Elm	DTN-06-01	15	**1**	2.2	**1**	4.3	6.4	6.4	0	6.4	**7**	
11	Thompson & Oak	DTN-04-04	10.25	**4**	8.7	**0**	0.0	8.7	8.7	4.3	13.0	**20**	**1/2 OF DTN-04-04**

Appendix 4-E. 20% (5-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
11	Thompson & Alley east of Oak	DTN-04-04	10.25	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**6**	**1/2 OF DTN-04-04**
8	Lincoln & Poplar	DTN-02-11	27.4	**4**	8.7	**0**	0.0	8.7	8.7	17.3	26.0	**25**	
9	Lincoln & Main	DTN-02-08	22.25	**4**	8.7	**0**	0.0	8.7	8.7	12	20.7	**12**	**N1/2 OF DTN-02-08**
9	Lincoln & Water	DTN-02-03	17.3	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	
10	Lincoln & Park	DTN-05-01	14.9	**6**	13.0	**0**	0.0	13.0	13.0	0	13.0	**15**	
10	Lincoln & alley between Elm & Park	DTN-05	16.1	**10**	21.7	**6**	25.7	47.3	16.1	275.0	291.1	**275**	**12 x 6 RCB to nowhere - W1/2 OF DTN-05**
10	Lincoln & Elm	DTN-05	16.1	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	**E1/2 OF DTN-05**
11	Lincoln & Oak	DTN-04-02	10.45	**2**	4.3	**0**	0.0	4.3	4.3	29.0	33.3	**20**	**W1/2 OF DTN-04-02**
11	Lincoln & Alley between Walnut & Oak	DTN-04-02	10.45	**2**	4.3	**0**	0.0	4.3	4.3	8.0	12.3	**8**	**E1/2 OF DTN-04-02**
11	Lincoln & Walnut	DTN-04-03	17.7	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**8**	
12	McKinley & Poplar	DTN-02-10	13.8	**4**	8.7	**1**	4.3	12.9	12.9	8.7	21.6	**25**	
13	McKinley & Main	DTN-02-08	44.5	**5**	10.8	**0**	0.0	10.8	10.8	27.6	38.4	**37**	
13	McKinley & Water	DTN-02-02	16.2	**4**	8.7	**0**	0.0	8.7	8.7	8.0	16.7	**10**	**N1/2 OF DTN-02-02**
14	McKinley & Park	DTN-04-05	7	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	
14	McKinley & Alley between Park & Elm	DTN-04	35.6	**0**	0.0	**0**	0.0	0.0	0.0	304.3	304.3	**250**	
14	McKinley & Elm	DTN-04	35.6	**4**	8.7	**0**	0.0	8.7	8.7	20.0	28.7	**25**	
15	McKinley & Oak	DTN-04-04	20.5	**2**	4.3	**0**	0.0	4.3	4.3	20.0	24.3	**20**	
13	Bryan & Main	DTN-02-07	27.6	**3**	6.5	**0**	0.0	6.5	6.5	37.0	43.5	**37**	
13	Bryan & Alley between Main & Water	DTN-02-05	15.4	**8**	17.3	**0**	0.0	17.3	15.4	0.0	15.4	**13**	
13	Bryan & Water	DTN-02-08	11.125	**1**	2.2	**0**	0.0	2.2	2.2	10.0	12.2	**10**	1/4 IF DTN-02-02\
14	Bryan & Park	DTN-03	7.25	**3**	6.5	**0**	0.0	6.5	6.5	0.0	6.5	**10**	W1/4 OF DTN-03
14	Bryan & Alley between Park & Elm	DTN-03	7.25	**4**	8.7	**4**	17.1	25.8	7.3	6.5	13.7	**275**	MIDDLE 1/4 OF DTN-05
14	Bryan & Elm	DTN-03	14.5	**8**	17.3	**8**	34.2	51.6	14.5	263.7	278.2	**275**	E1/2 OF DTN-03
16	Cleveland & Main	DTN-02-06	22.1	**2**	4.3	**0**	0.0	4.3	4.3	37.0	41.3	**52**	
16	Cleveland & Alley between Main & Water	DTN-02-04	12.8	**2**	4.3	**0**	0.0	4.3	4.3	54.3	58.7	**40**	

Appendix 4-E. 20% (5-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
16	Cleveland & Water	DTN-02-02	8.1	**2**	4.3	**0**	0.0	4.3	4.3	50.0	54.3	**70**	S1/4 OF DTN-02-09
17	Cleveland & Park	DTN-02	17.4	**2**	4.3	**0**	0.0	4.3	4.3	54.3	58.7	**70**	W1/2 OF DTN-02
17	Cleveland & Elm	DTN-02	17.4	**3**	6.5	**0**	0.0	6.5	6.5	335.8	342.3	**325**	E1/2 PF DTN-02
18	Cleveland & Oak	DTN-02-01	3.3	**1**	2.2	**0**	0.0	2.2	2.2	0.0	2.2	**7**	
19	Washington & Elm	DTN-01	31.4	**3**	6.5	**0**	0.0	6.5	6.5	325.0	331.5	**325**	

Appendix 4-E. 10% (10-Year) Inlet Analysis

Atlas Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downstream trunk line	Pipe Capacity of downstream trunk line	Comments
1	Hobson & Main	DTN-10-02	35.7	**8**	17.3	**0**	0.0	17.3	17.3	0	17.3	6	
1	Hobson & Water	DTN-10-01	29.3	**7**	15.2	**0**	0.0	15.2	15.2	6.0	21.2	15	
2	Hobson & Park	DTN-10	40.5	**8**	17.3	**0**	0.0	40.5	40.5	105.0	145.5	**260**	
3	Hobson & Oak	DTN-09-05	40.9	**8**	17.3	**0**	0.0	40.9	40.9	5.0	45.9	**40**	
3	Hobson & Walnut	DTN-09-06	25.1	**6**	13.0	**0**	0.0	13.0	13.0	0	13.0	**5**	
4	Dewey & Poplar	DTN-09-10	23.7	**9**	19.5	**27**	115.6	135.0	23.7	0	23.7	**7**	
5	Dewey & Main	DTN-09-09	25.3	**4**	8.7	**6**	25.7	34.3	25.3	7.0	32.3	**6**	
5	Dewey & Water				0.0		0.0	0.0	0.0	6.0	6.0	**15**	
	Dewey & Park	DTN-09	48.7										
6	Dewey & Park	DTN-09-01	13.2	**8**	17.3	**0**	0.0	61.9	61.9	216.5	229.7	**250**	DTN-09+DTN-09-01
6	Dewey & Elm	DTN-09-02	24.3	**5**	10.8	**0**	0.0	10.8	10.8	55.0	65.8	**65**	
7	Dewey & Oak	DTN-09-03	32.9	**6**	13.0	**0**	0.0	13.0	13.0	45.0	58.0	**55**	
7	Dewey & Walnut	DTN-09-04	34.6	**7**	15.2	**0**	0.0	15.2	15.2	0	15.2	**5**	
4	Lee & Poplar	DTN-02-13	48.4	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**10**	
5	Lee & Main	DTN-08-02	26.9	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	
5	Lee & Water	DTN-08-01	22	**6**	13.0	**0**	0.0	13.0	13.0	6.0	19.0	**8**	N1/2 OF DTN-08-01
6	Lee & Park	DTN-08	33.5	**6**	13.0	**0**	0.0	33.5	33.5	245.7	279.2	**270**	
6	Lee & Elm	DTN-09-08	41.4	**5**	10.8	**0**	0.0	10.8	10.8	18.0	28.8	**8**	**2/3 OF DTN 09-08**
7	Lee & Oak	DTN-09-08	20.7	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**6**	**1/3 OF DTN 09-08**
8	Thompson & Poplar	DTN-02-12	25.9	**4**	8.7	**0**	0.0	8.7	8.7	8.7	17.3	**18**	
9	Thompson & Main	DTN-02-09	30.5	**6**	13.0	**1**	4.3	17.3	17.3	0	17.3	**12**	
10	Thompson & Park	DTN-07	33.2	**4**	8.7	**0**	0.0	8.7	8.7	270.0	278.7	**270**	
10	Thompson & Alley between Park & Elm	DTN-06	18	**4**	8.7	**0**	0.0	8.7	8.7	276.4	285.1	**270**	
10	Thompson & Elm	DTN-06-01	17.6	**1**	2.2	**1**	4.3	6.4	6.4	0	6.4	**7**	
11	Thompson & Oak	DTN-04-04	12.1	**4**	8.7	**0**	0.0	8.7	8.7	4.3	13.0	**20**	**1/2 OF DTN-04-04**
11	Thompson & Alley east of Oak	DTN-04-04	12.1	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**6**	**1/2 OF DTN-04-04**

10% (10-Year) Inlet Analysis

Atlase Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downtream trunk line	Pipe Capacity of downstream trunk line	Comments
8	Lincoln & Poplar	DTN-02-11	33.3	**4**	8.7	**0**	0.0	8.7	8.7	17.3	26.0	**25**	
9	Lincoln & Main	DTN-02-08	26.2	**4**	8.7	**0**	0.0	8.7	8.7	12	20.7	**12**	**N1/2 OF DTN-02-08**
9	Lincoln & Water	DTN-02-03	20.2	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	
10	Lincoln & Park	DTN-05-01	17.4	**6**	13.0	**0**	0.0	13.0	13.0	0	13.0	**15**	
10	Lincoln & alley between Elm & Park	DTN-05	18.95	**10**	21.7	**6**	25.7	47.3	19.0	270.0	289.0	**275**	**12 x 6 RCB to nowhere - W1/2 OF DTN-05**
10	Lincoln & Elm	DTN-05	18.95	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	**E1/2 OF DTN-05**
11	Lincoln & Oak	DTN-04-02	12.75	**2**	4.3	**0**	0.0	4.3	4.3	29.0	33.3	**20**	**W1/2 OF DTN-04-02**
11	Lincoln & Alley between Walnut & Oak	DTN-04-02	12.75	**2**	4.3	**0**	0.0	4.3	4.3	8.0	12.3	**8**	**E1/2 OF DTN-04-02**
11	Lincoln & Walnut	DTN-04-03	21.2	**4**	8.7	**0**	0.0	8.7	8.7	0	8.7	**8**	
12	McKinley & Poplar	DTN-02-10	16.8	**4**	8.7	**1**	4.3	12.9	12.9	8.7	21.6	**25**	
13	McKinley & Main	DTN-02-08	52.4	**5**	10.8	**0**	0.0	10.8	10.8	27.6	38.4	**37**	
13	McKinley & Water	DTN-02-02	20.35	**4**	8.7	**0**	0.0	8.7	8.7	8.0	16.7	**10**	**N1/2 OF DTN-02-02**
14	McKinley & Park	DTN-04-05	8.7	**2**	4.3	**0**	0.0	4.3	4.3	0	4.3	**10**	
14	McKinley & Alley between Park & Elm	DTN-04	42.4	**0**	0.0	**0**	0.0	0.0	0.0	304.3	304.3	**250**	
14	McKinley & Elm	DTN-04	42.4	**4**	8.7	**0**	0.0	8.7	8.7	20.0	28.7	**25**	
15	McKinley & Oak	DTN-04-04	24.2	**2**	4.3	**0**	0.0	4.3	4.3	20.0	24.3	**20**	
13	Bryan & Main	DTN-02-07	32.3	**3**	6.5	**0**	0.0	6.5	6.5	37.0	43.5	**37**	
13	Bryan & Alley between Main & Water	DTN-02-05	18.5	**8**	17.3	**0**	0.0	17.3	17.3	0.0	17.3	**13**	
13	Bryan & Water	DTN-02-08	13.1	**1**	2.2	**0**	0.0	2.2	2.2	10.0	12.2	**10**	1/4 IF DTN-02-02\
14	Bryan & Park	DTN-03	9.25	**3**	6.5	**0**	0.0	6.5	6.5	0.0	6.5	**10**	W1/4 OF DTN-03
14	Bryan & Alley between Park & Elm	DTN-03	9.25	**4**	8.7	**4**	17.1	25.8	9.3	6.5	15.7	**275**	MIDDLE 1/4 OF DTN-05
14	Bryan & Elm	DTN-03	18.5	**8**	17.3	**8**	34.2	51.6	18.5	265.7	284.2	**275**	E1/2 OF DTN-03
16	Cleveland & Main	DTN-02-06	26.6	**2**	4.3	**0**	0.0	4.3	4.3	37.0	41.3	**52**	
16	Cleveland & Alley between Main & Water	DTN-02-04	15.2	**2**	4.3	**0**	0.0	4.3	4.3	54.3	58.7	**40**	
16	Cleveland & Water	DTN-02-02	10.175	**2**	4.3	**0**	0.0	4.3	4.3	50.0	54.3	**70**	S1/4 OF DTN-02-09
17	Cleveland & Park	DTN-02	22.35	**2**	4.3	**0**	0.0	4.3	4.3	54.3	58.7	**70**	W1/2 OF DTN-02
17	Cleveland & Elm	DTN-02	22.35	**3**	6.5	**0**	0.0	6.5	6.5	335.8	342.3	**325**	E1/2 PF DTN-02

10% (10-Year) Inlet Analysis

Atlase Sheet No.	Intersection	Junction Notation	Surface inflow	# of Grates	Flow through grates assuming 1' depth and 70% clogging	# of Throats without grate (ignore all throats behind grates)	Flow at throats assuming free flow and 1' depth	Total flow from grates and throats	Surface Inflow - Total flow from grates and throats	Flow from upstream pipes or upstream pipe capacity	Total flow into downtream trunk line	Pipe Capacity of downstream trunk line	Comments
18	Cleveland & Oak	DTN-02-01	4.3	**1**	2.2	**0**	0.0	2.2	2.2	0.0	2.2	**7**	
19	Washington & Elm	DTN-01	39.1	**3**	6.5	**0**	0.0	6.5	6.5	325.0	331.5	**325**	

Sapulpa Downtown Inlet Analysis

Appendix E

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	1812	153	CICI	1D	18.00	0.00	ROUND	E		M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1812.JPG	1812
	1813	154	CICI	1D	18.00	0.00	ROUND	N	RCP	M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1813.JPG	1813
	1816	2	CIHI	1D	18.00	0.00	ROUND	S	RCP	M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1816.JPG	1816
	1820	155	CICI	2C	18.00	0.00	ROUND	S	RCP	M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1820.JPG	1820
	1821	156	CICI	1C	18.00	0.00	ROUND	S	RCP	M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1821.JPG	1821
	1822	181	CICI	1C	0.00	0.00				M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1822.JPG	1822
	1823	157	CICI	2F	48.00	36.00		N	RCB	M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1823.JPG	1823
	1826	182	CICI	2D	0.00	0.00				M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1826.JPG	1826

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	1827	183	CICI	2B	0.00	0.00				M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1827.JPG	1827
	1828	184	MH		0.00	0.00				M:\2008\08SAP06_Phase_II_MDP\GIS\Data\Survey\Photos\08SAP06-MAY21-09 1828.JPG	1828
	I094	3	CICI	1	8.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I094.jpg	
	I095	4	CICI	1	8.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I095.jpg	
	I096	159	GI		24.00	0.00	ROUND	S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I096.jpg	
	I1001	68	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1001.jpg	
	I1002	69	CICI	1	15.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1002.jpg	
	I1003	167	GI		66.00	0.00		S	MAS	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1003.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1004	70	CICI	2B	15.00	0.00		NW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1004.jpg	
	I1005	71	CICI	2B	15.00	0.00		NE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1005.jpg	
	I1006	72	CICI	2B	15.00	0.00		SE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1006.jpg	
	I1007	1	AREA INLET		18.00	0.00	ROUND	SE	CMP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1007.jpg	UP_FL
	I1008	73	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1008.jpg	
	I1009	74	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1009.jpg	
	I1010	75	CICI	2	18.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1010.jpg	
	I1011	76	CICI	2	18.00	0.00		SE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1011.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1012	77	CICI	2	18.00	0.00		NE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1012.jpg	
	I1013	78	CICI	1	12.00	0.00		N	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1013.jpg	
	I1014	79	CICI	1	12.00	0.00		N	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1014.jpg	
	I1015	80	CICI	1	12.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1015.jpg	
	I1016	81	CICI	1	15.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1016.jpg	
	I1017	168	GI		12.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1017.jpg	
	I1018	169	GI		12.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1018.jpg	
	I1019	82	CICI	1	8.00	0.00		W	PVC	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1019.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1020	83	CICI	2	12.00	0.00		W		M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1020.jpg	
	I1021	170	GI		8.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1021.jpg	
	I103	158	CIHI		12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I103.jpg	
	I104	5	CICI	1	12.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I104.jpg	
	I105	6	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I105.jpg	
	I106	7	CICI	1	12.00	0.00	ROUND	S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I106.jpg	
	I107	8	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I107.jpg	
	I108	9	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I108.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I109	10	CICI	1	12.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I109.jpg	
	I1094	84	CICI	1	12.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1094.jpg	
	I1095	85	CICI	1	12.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1095.jpg	
	I1096	86	CICI	1	12.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1096.jpg	
	I1097	87	CICI	1	12.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1097.jpg	
	I1098	171	GI		84.00	0.00		S	MAS	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1098.jpg	
	I1099	88	CICI	1	12.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1099.jpg	
	I110	11	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I110.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1100	89	CICI	2B	18.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1100.jpg	
	I1101	90	CICI	2B	18.00	0.00		W	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1101.jpg	
	I1102	91	CICI	2B	18.00	0.00		N	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1102.jpg	
	I1103	92	CICI	2B	18.00	0.00		SE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1103.jpg	
	I111	12	CICI	1	12.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I111.jpg	
	I1111	172	GI		10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1111.jpg	
	I1112	93	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1112.jpg	
	I1114	94	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1114.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1115	95	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1115.jpg	
	I1116	96	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1116.jpg	
	I1117	97	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1117.jpg	
	I1118	98	CICI	2B	18.00	0.00		SE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1118.jpg	
	I1119	99	CICI	2B	18.00	0.00		NE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1119.jpg	
	I112	13	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I112.jpg	
	I1120	173	GI		10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1120.jpg	
	I1121	100	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1121.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1122	174	GI		10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1122.jpg	
	I1123	101	CICI	2	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1123.jpg	
	I1124	102	CICI	1	0.00	0.00				M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1124.jpg	
	I1125	103	CICI	1	0.00	0.00				M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1125.jpg	
	I1126	104	CICI	1	12.00	0.00		SW	CMP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1126.jpg	
	I1127	105	CICI	1	12.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1127.jpg	
	I1129	106	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1129.jpg	
	I113	14	CICI	1	12.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I113.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1130	107	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1130.jpg	
	I1131	108	CICI	1	10.00	0.00		SW	VCP[	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1131.jpg	
	I1132	109	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1132.jpg	
	I1133	110	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1133.jpg	
	I1134	111	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1134.jpg	
	I1135	112	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1135.jpg	
	I1136	113	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1136.jpg	
	I1137	114	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1137.jpg	

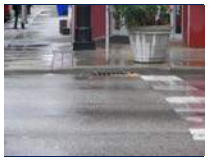
Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1138	115	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1138.jpg	
	I1139	116	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1139.jpg	
	I114	15	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I114.jpg	
	I1140	117	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1140.jpg	
	I1141	118	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1141.jpg	
	I1142	119	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1142.jpg	
	I1143	175	GI		10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1143.jpg	
	I1144	120	CICI	2	18.00	0.00		NE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1144.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1145	121	CICI	2	18.00	0.00		SE	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1145.jpg	
	I1146	122	CICI	2	18.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1146.jpg	
	I1147	123	CICI	2	18.00	0.00		NW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1147.jpg	
	I1148	124	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1148.jpg	Silted In
	I1149	125	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1149.jpg	
	I115	16	CICI	1	12.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I115.jpg	
	I1150	126	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1150.jpg	
	I1151	180	GI		8.00	0.00		W	PVC	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1151.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1152	127	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1152.jpg	
	I1153	128	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1153.jpg	
	I1154	129	CICI	1	10.00	0.00		W	VCP	NO_PIC	
	I1155	176	GI		10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1155.jpg	
	I1156	130	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1156.jpg	
	I1157	131	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1157.jpg	
	I1158	132	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1158.jpg	
	I1159	133	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1159.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I116	17	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I116.jpg	
	I1160	134	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1160.jpg	
	I1161	135	CICI	1	12.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1161.jpg	
	I1162	177	GI		10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1162.jpg	
	I1163	136	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1163.jpg	
	I1164	137	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1164.jpg	
	I1165	138	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1165.jpg	
	I1166	139	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1166.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1167	140	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1167.jpg	
	I1168	141	CICI	1	10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1168.jpg	
	I1169	142	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1169.jpg	Silted In
	I117	18	CICI	1	12.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I117.jpg	
	I1170	143	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1170.jpg	
	I1171	144	CICI	1	12.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1171.jpg	
	I1172	145	CICI	1	12.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1172.jpg	
	I1173	146	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1173.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I1174	147	CICI	2	18.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1174.jpg	
	I1175	148	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1175.jpg	
	I1176	149	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1176.jpg	
	I1177	150	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1177.jpg	
	I1178	151	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1178.jpg	
	I1179	152	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1179.jpg	
	I118	19	CICI	1	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I118.jpg	
	I119	20	CICI	1	12.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I119.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
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	I1240	179	GI		10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I1240.jpg	
	I204	21	CICI	2	10.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I204.jpg	
	I205	22	CICI	2	12.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I205.jpg	
	I206	23	CICI	2	15.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I206.jpg	
	I207	24	CICI	2	10.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I207.jpg	
	I208	25	CICI	1	10.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I208.jpg	
	I209	26	CICI	1	10.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I209.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I210	27	CICI	1	10.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I210.jpg	
	I211	28	CICI	1	10.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I211.jpg	
	I212	29	CICI	1	10.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I212.jpg	
	I213	30	CICI	1	10.00	0.00	ROUND	E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I213.jpg	
	I214	160	GI		10.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I214.jpg	
	I215	31	CICI	1	10.00	0.00	ROUND	SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I215.jpg	
	I216	32	CICI	1	10.00	0.00	ROUND	NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I216.jpg	
	I217	33	CICI	1	10.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I217.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I218	34	CICI	1	10.00	0.00	ROUND	NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I218.jpg	
	I219	161	GI		12.00	0.00	ROUND	E	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I219.jpg	
	I220	35	CICI	1	10.00	0.00	ROUND	SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I220.jpg	
	I221	36	CICI	1	10.00	0.00	ROUND	SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I221.jpg	
	I222	37	CICI	1	10.00	0.00	ROUND	NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I222.jpg	
	I223	38	CICI	1	10.00	0.00	ROUND	W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I223.jpg	5+' Unable to Reach Bottom
	I224	39	CICI	1	10.00	0.00	ROUND	NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I224.jpg	> 5 FT INVERT
	I225	40	CICI	1	10.00	0.00	ROUND	SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I225.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I227	41	CICI	1	18.00	0.00	ROUND	SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I227.jpg	
	I230	162	GI		8.00	0.00		NW	PVC	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I230.jpg	
	I231	163	GI		18.00	0.00		W	GI	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I231.jpg	
	I233	42	CICI	2	12.00	0.00			RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I233.jpg	
	I318	43	CICI	2	12.00	0.00		SE	PVC	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I318.jpg	
	I319	44	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I319.jpg	Silted In
	I320	164	GI		10.00	0.00		NE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I320.jpg	Silted In
	I321	45	CICI	1	10.00	0.00		N	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I321.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I322	46	CICI	2	48.00	36.00		S	RCB	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I322.jpg	
	I323	47	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I323.jpg	
	I324	48	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I324.jpg	
	I325	49	CICI	1	15.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I325.jpg	
	I326	50	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I326.jpg	
	I327	51	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I327.jpg	
	I328	52	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I328.jpg	
	I329	53	CICI	1	10.00	0.00		SW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I329.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I330	165	GI		12.00	0.00		S	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I330.jpg	
	I331	166	GI		10.00	0.00		NW	RCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I331.jpg	
	I332	54	CICI	2	60.00	36.00		W	RCB	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I332.jpg	
	I333	55	CICI	1	10.00	0.00		W	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I333.jpg	
	I334	56	CICI	1	10.00	0.00		E	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I334.jpg	
	I335	57	CICI	1	10.00	0.00		S	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I335.jpg	
	I336	58	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I336.jpg	
	I337	59	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I337.jpg	

Sapulpa Downtown Inlet Analysis

	STRUC_ID	ID	STRUC_TYP	STRUC_DESC	P_OUT_W	P_OUT_H	P_OUT_SHP	P_OUT_DIR	P_OUT_MAT	PHOTO:	COMMENT
	I338	60	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I338.jpg	
	I339	61	CICI	1	10.00	0.00		SE	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I339.jpg	
	I340	62	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I340.jpg	
	I341	63	CICI	1	10.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I341.jpg	
	I342	64	CICI	1	10.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I342.jpg	
	I343	65	CICI	1	12.00	0.00		SW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I343.jpg	
	I344	66	CICI	1	12.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I344.jpg	
	I345	67	CICI	2	12.00	0.00		NW	VCP	M:\2008\08SAP01_Sapulpa_MDP\SURVEY\PICS\INLET_PICS\I345.jpg	

The City of Sapulpa
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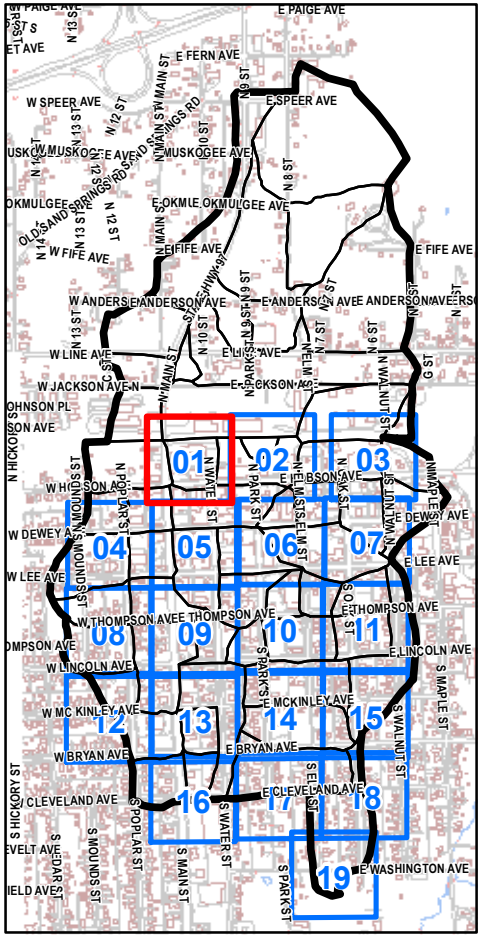
City of Sapulpa
Downtown Inlet Analysis

N

0 25 50 100 Feet



MESHEK & ASSOCIATES, PLC

City of Sapulpa
Downtown Inlet Analysis

N

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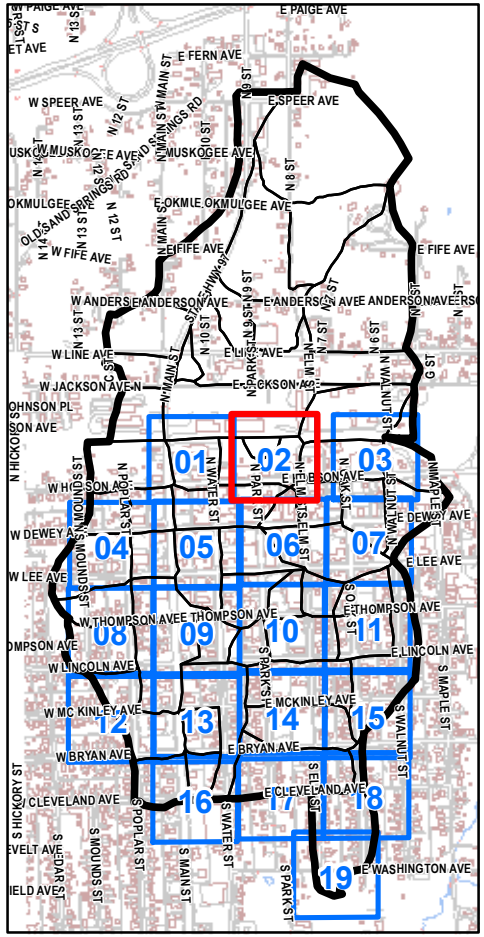
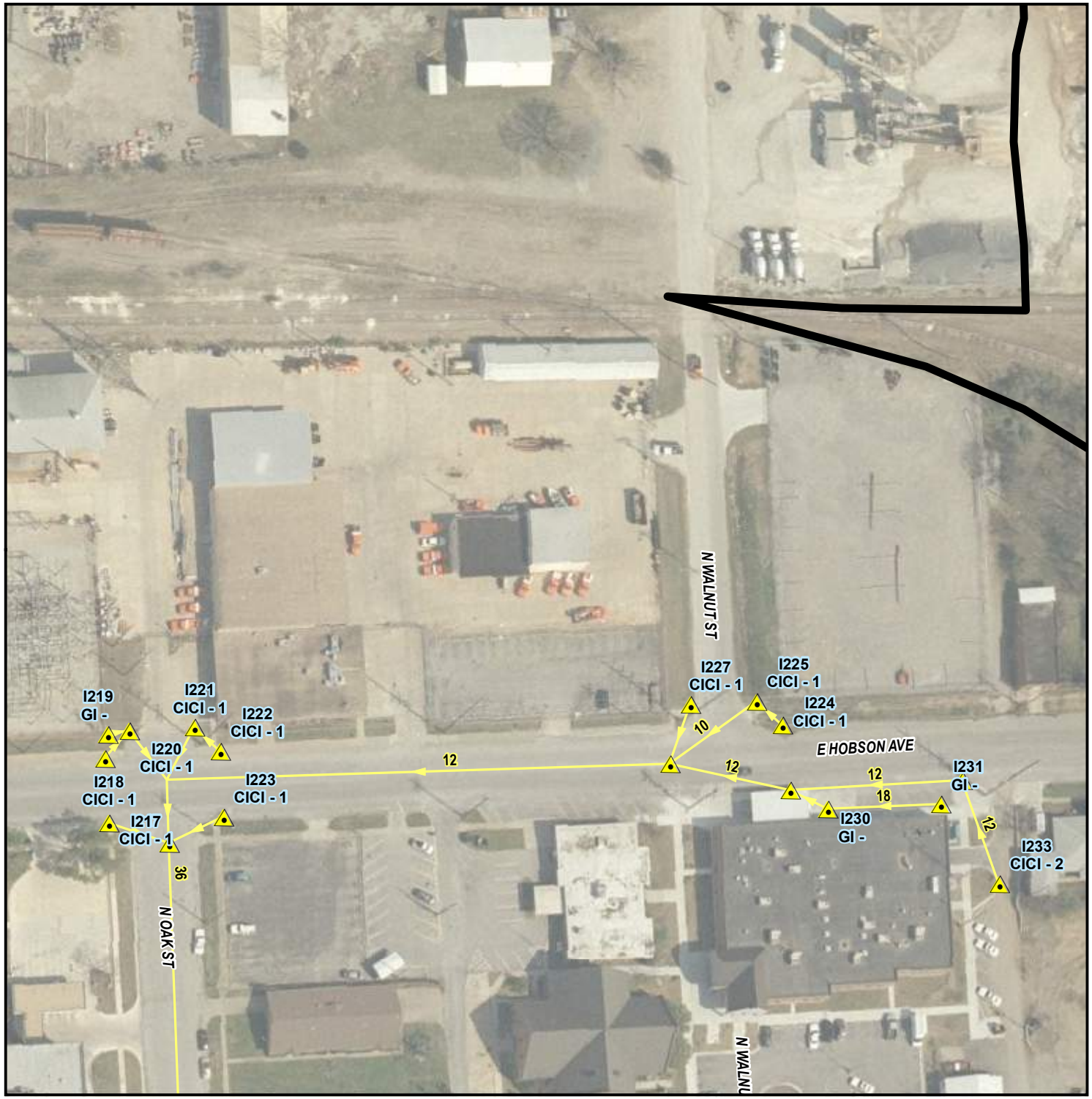


City of Sapulpa
Downtown Inlet Analysis



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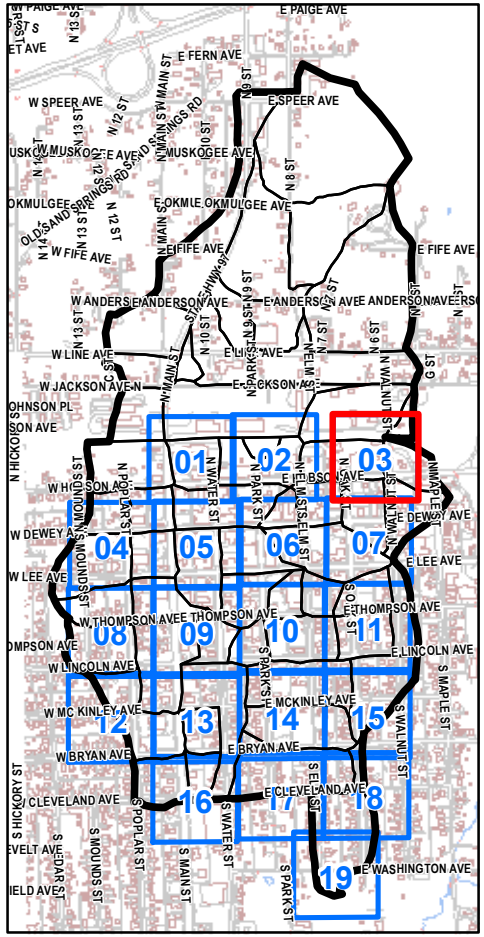
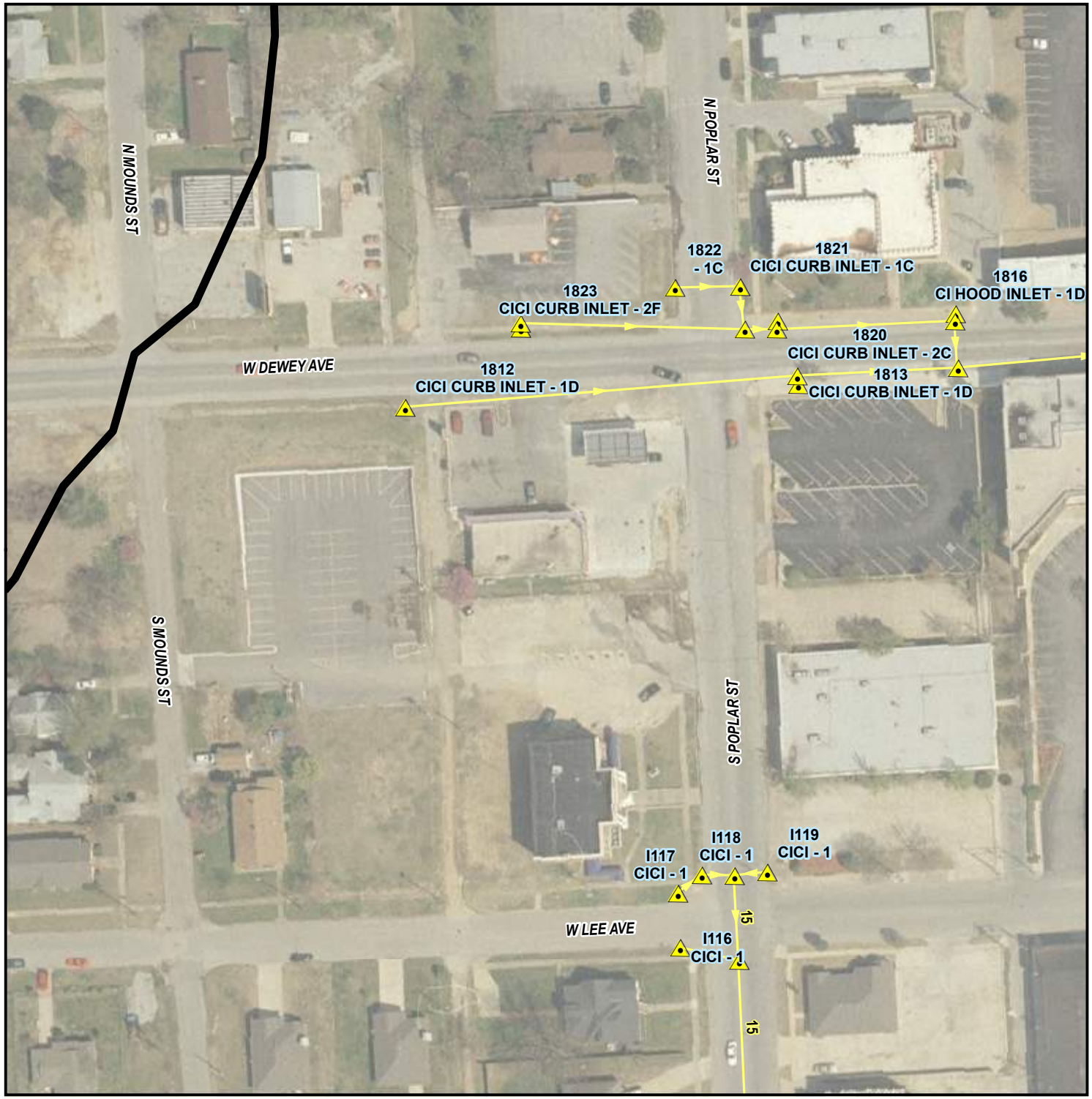
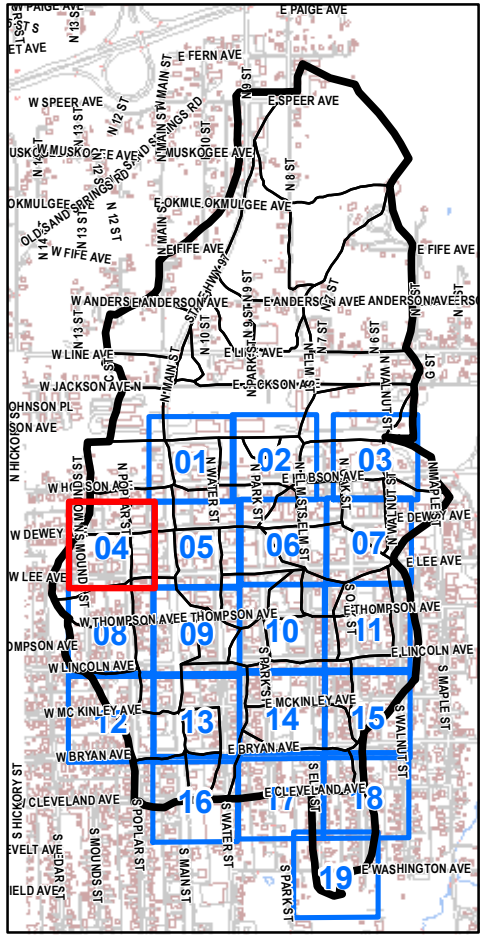


MESHEK & ASSOCIATES, PLC

City of Sapulpa
Downtown Inlet Analysis





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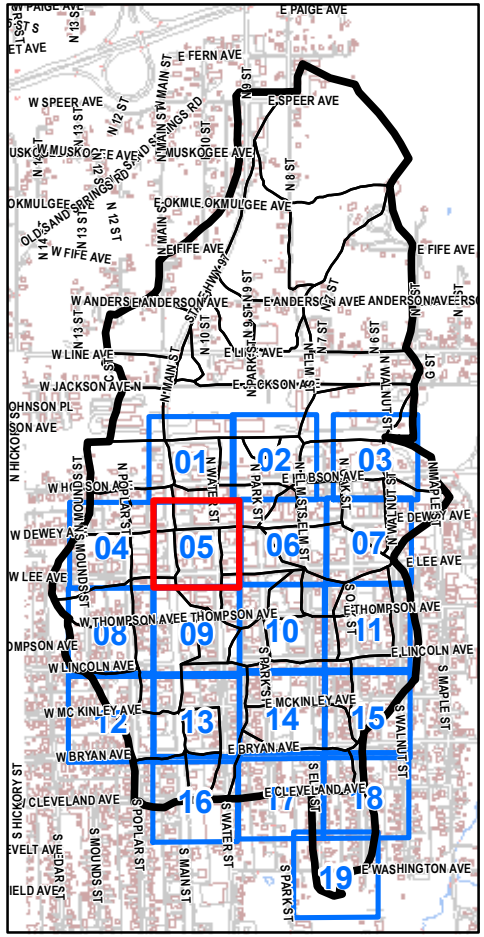
0 25 50 100 Feet

City of Sapulpa
Downtown Inlet Analysis



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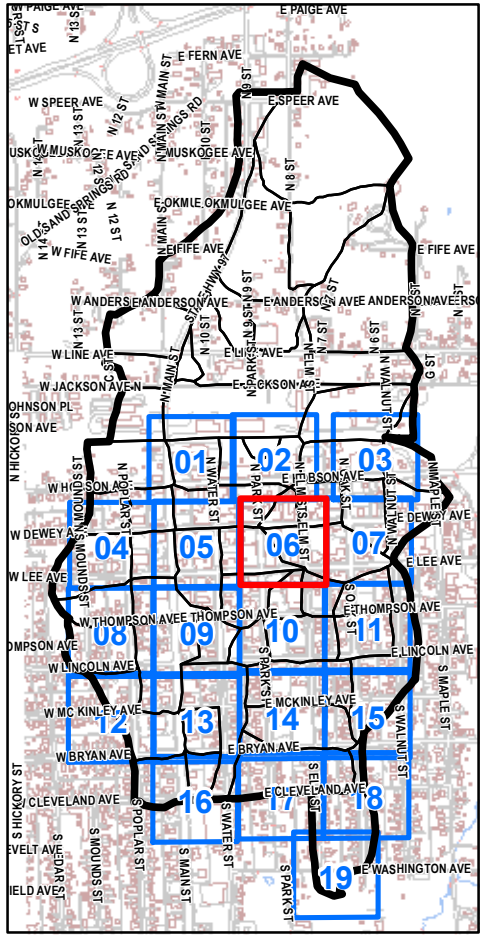
Oklahoma's Most Connected City

City of Sapulpa
Downtown Inlet Analysis

N

0 25 50 100 Feet



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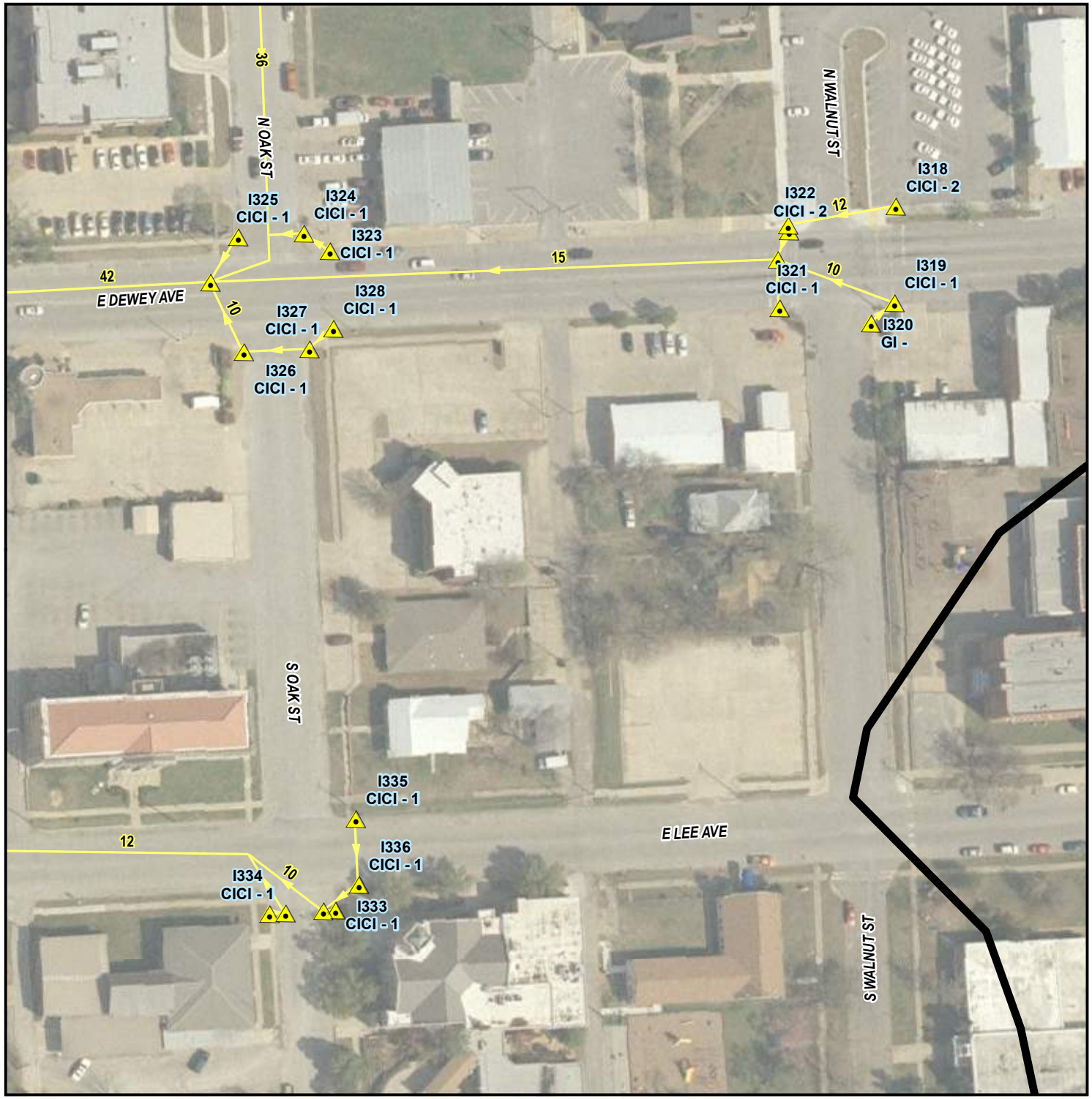

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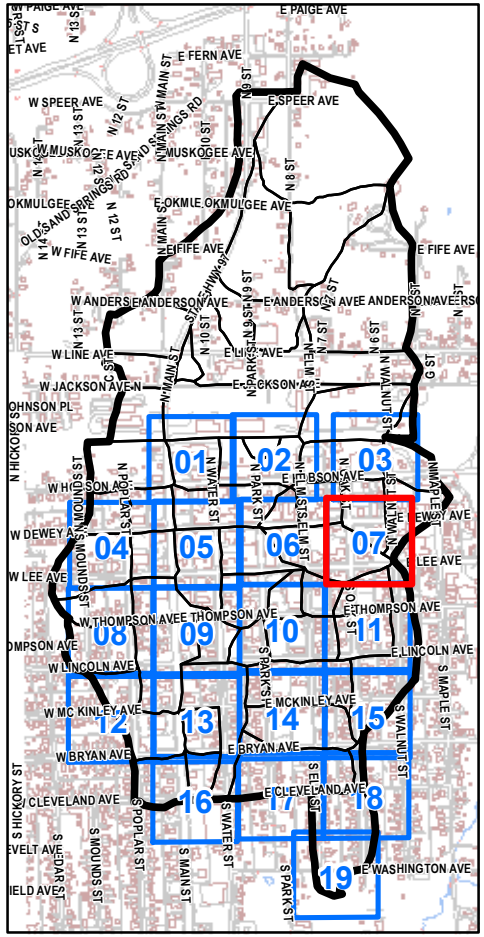

MESHEK & ASSOCIATES, PLC

City of Sapulpa
Downtown Inlet Analysis

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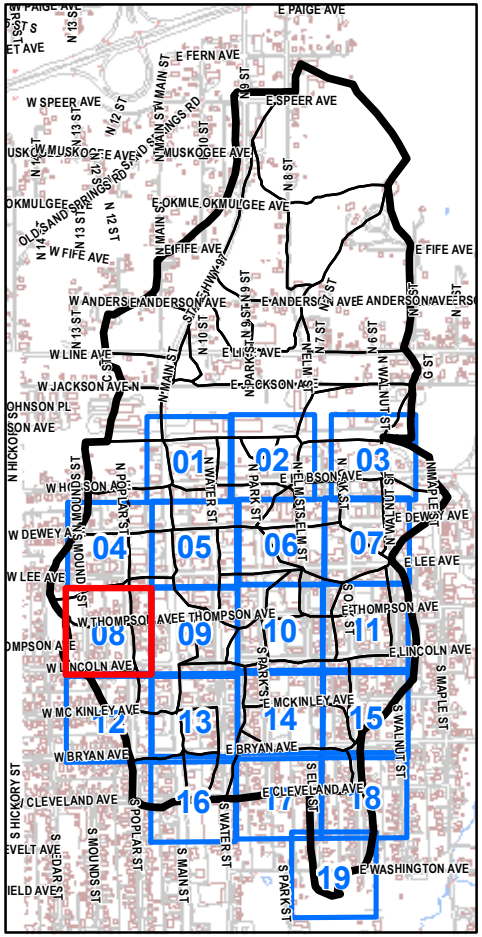

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Oklahoma's Most Connected City

City of Sapulpa
Downtown Inlet Analysis

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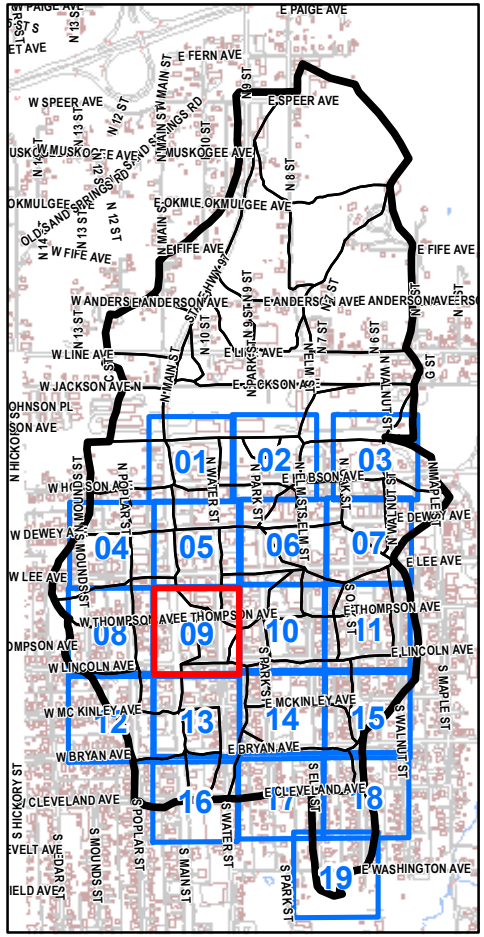

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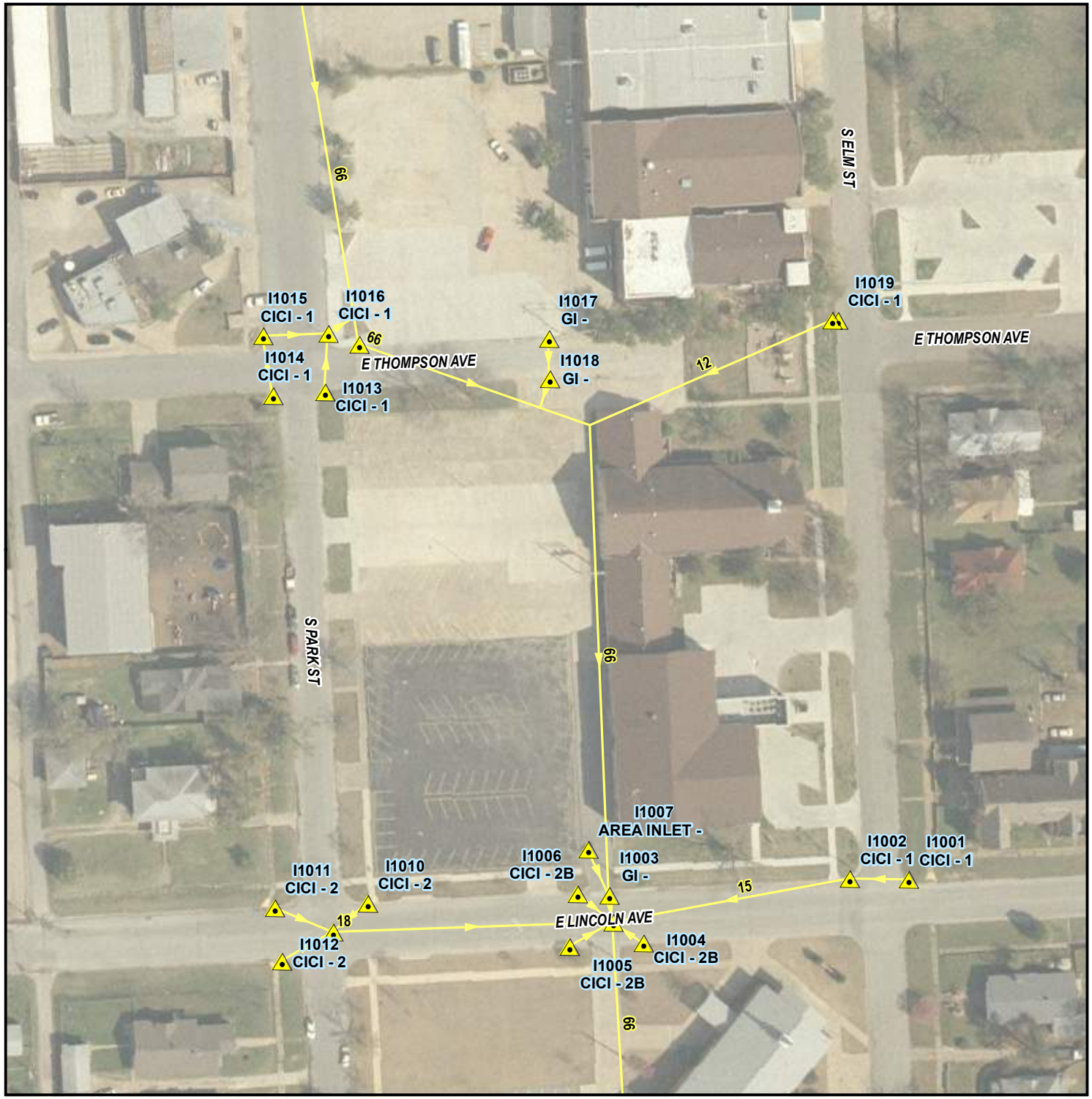
City of Sapulpa
Downtown Inlet Analysis



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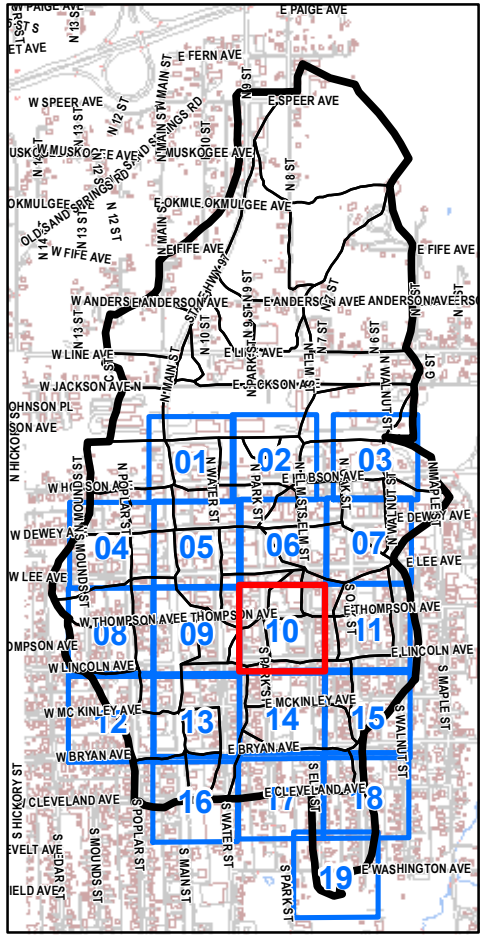

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City of Sapulpa
Downtown Inlet Analysis

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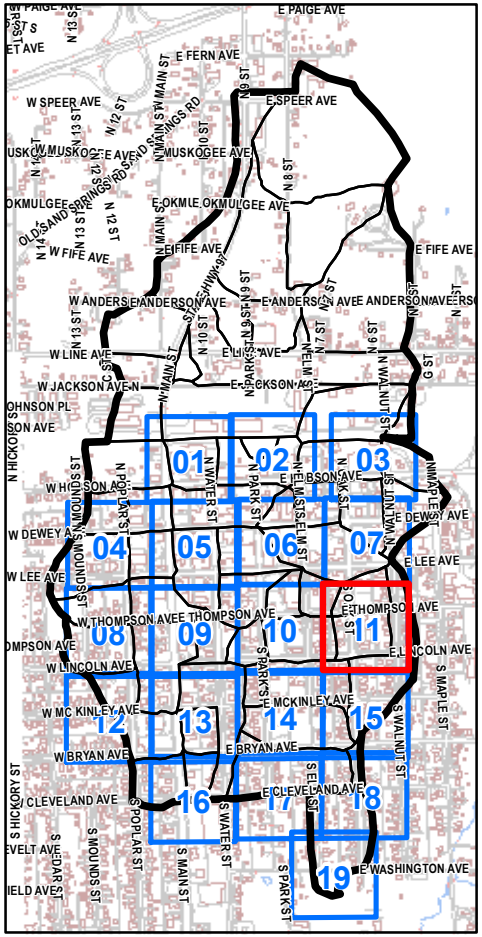

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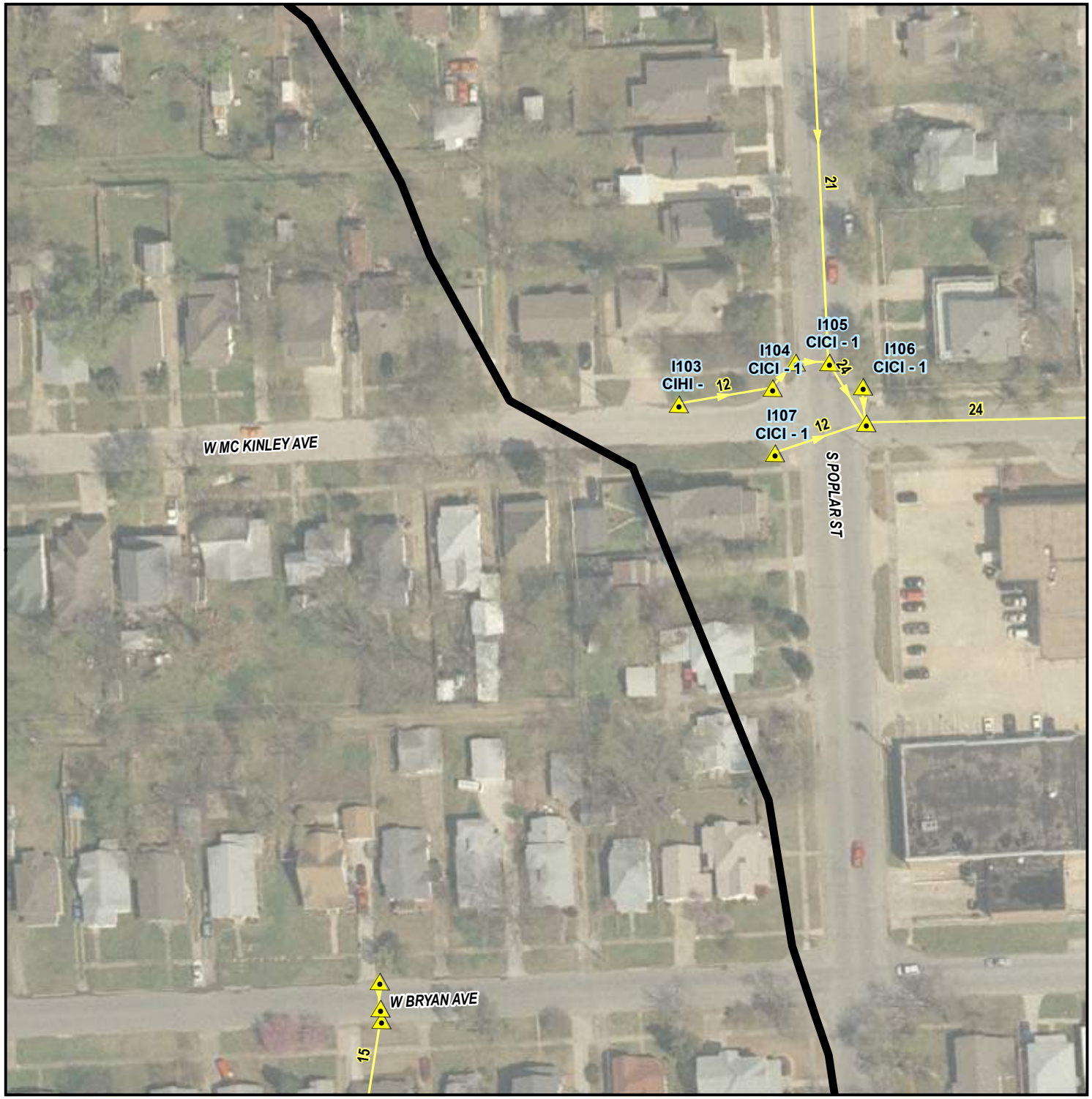

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City of Sapulpa
Downtown Inlet Analysis

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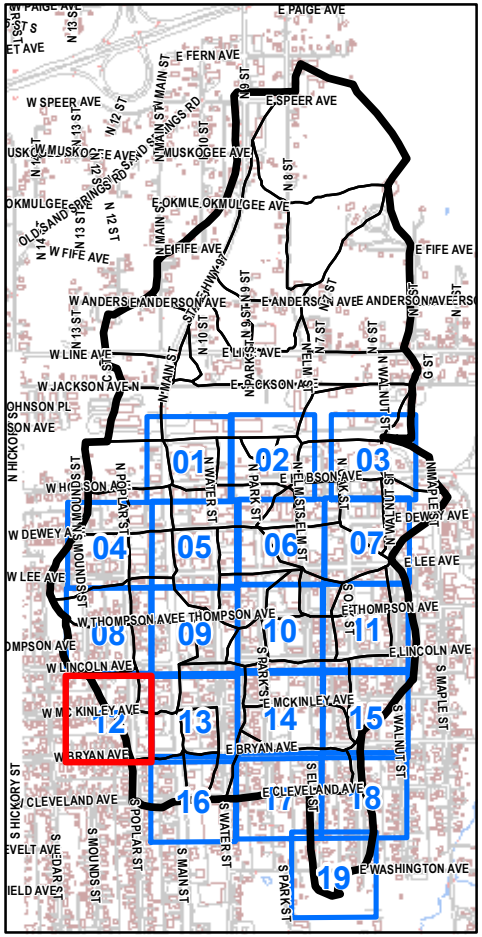

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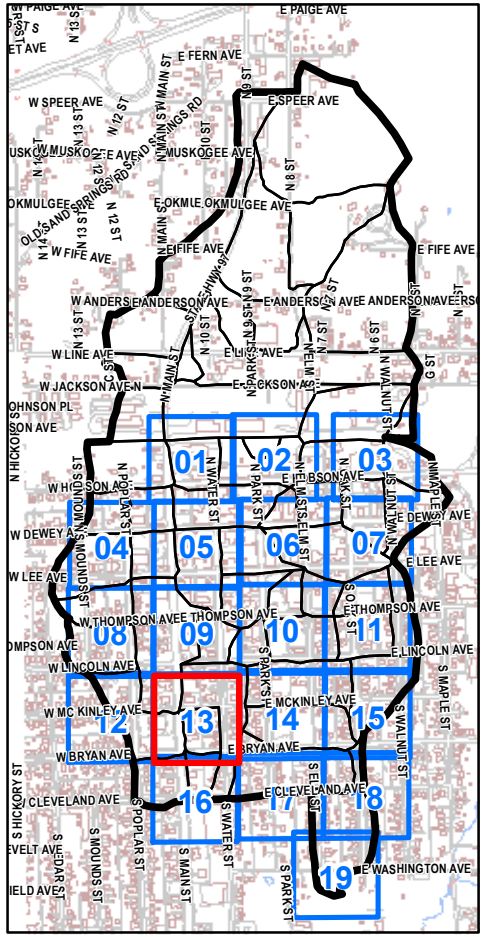
City of Sapulpa
Downtown Inlet Analysis



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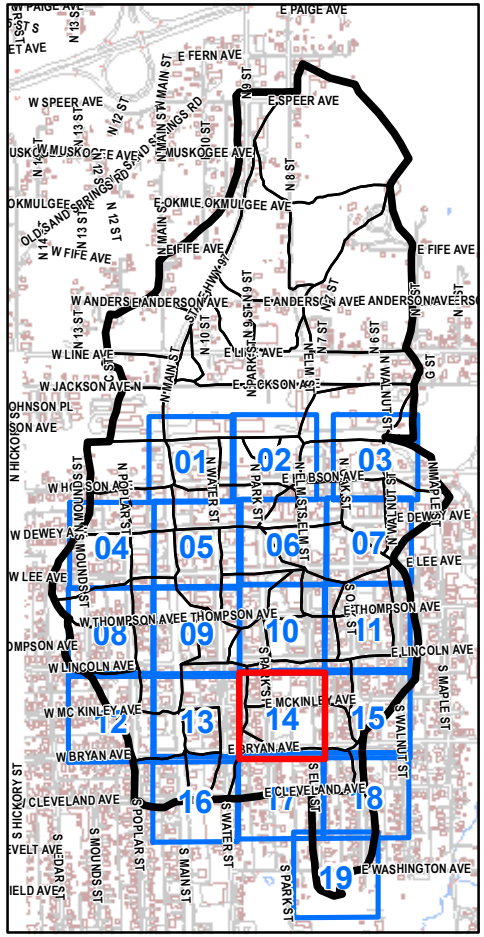
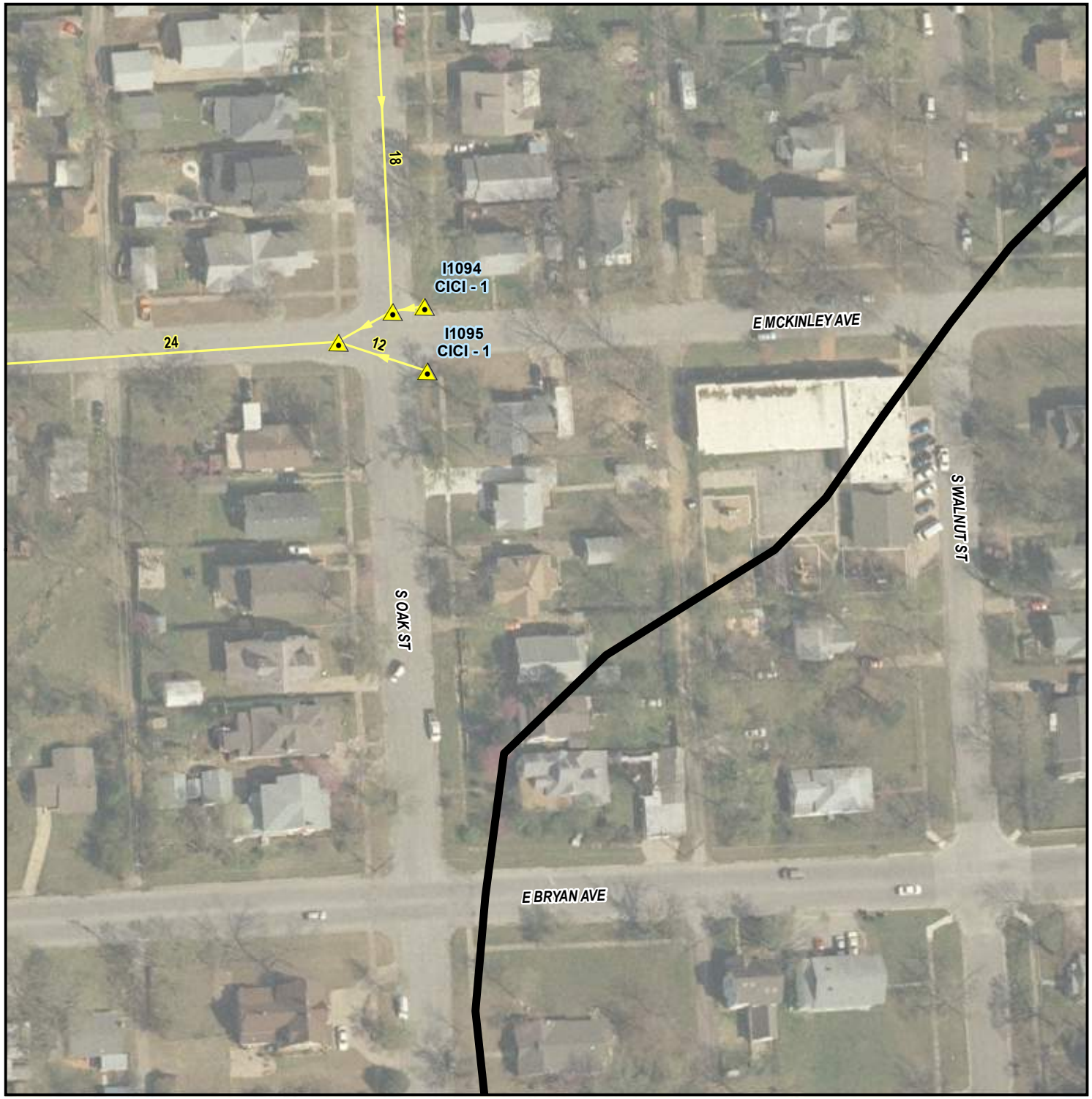
City of Sapulpa
Downtown Inlet Analysis



City of Sapulpa
Downtown Inlet Analysis



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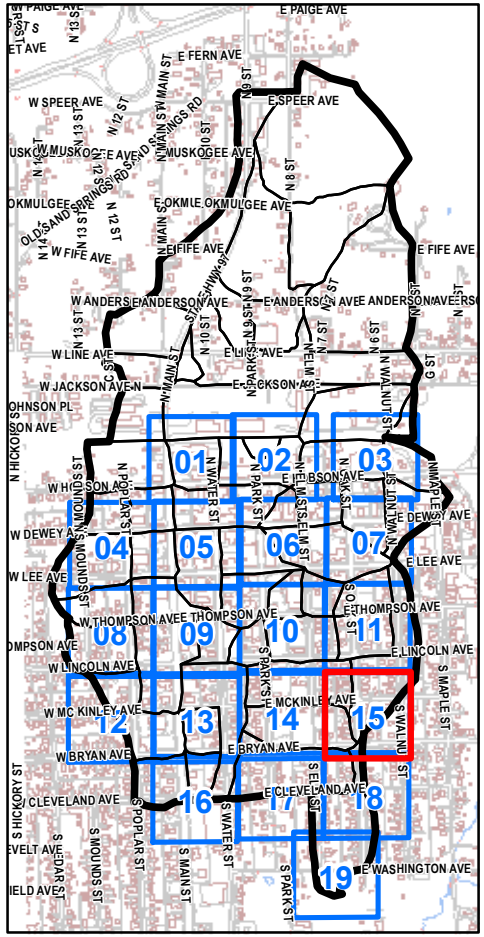

City of Sapulpa
Downtown Inlet Analysis

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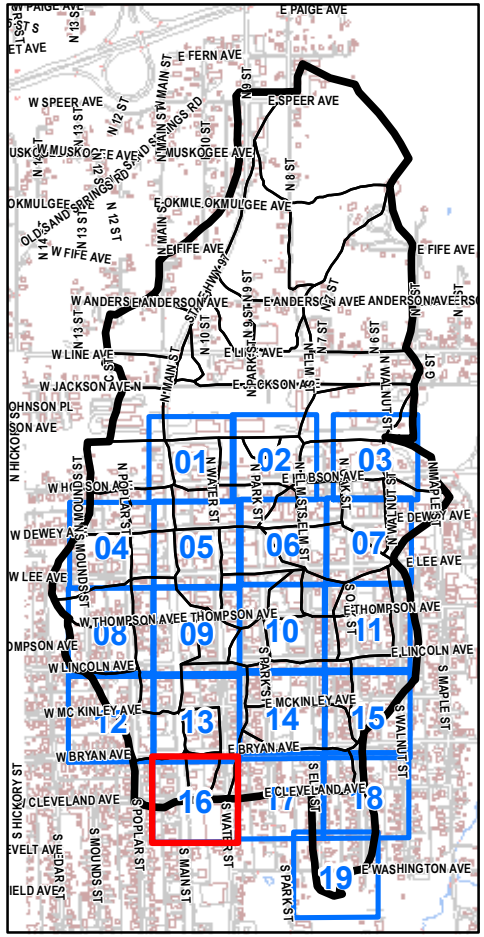

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City of Sapulpa
Downtown Inlet Analysis

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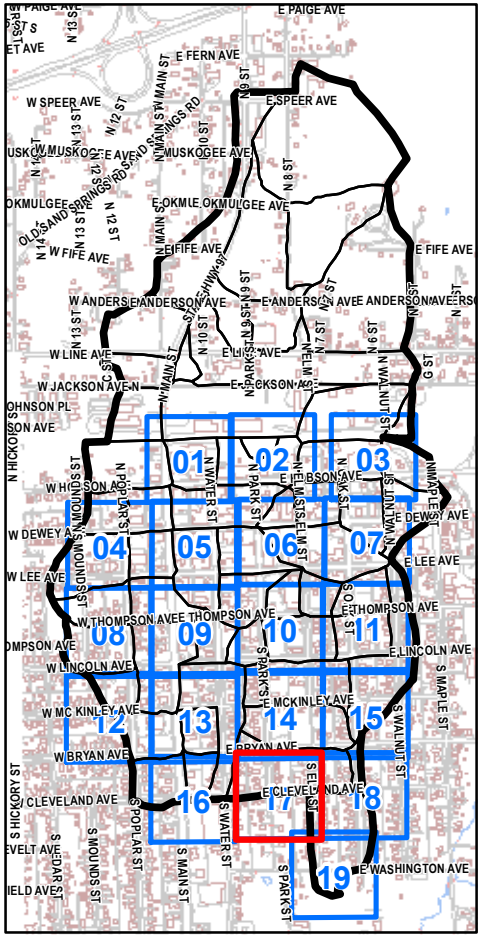

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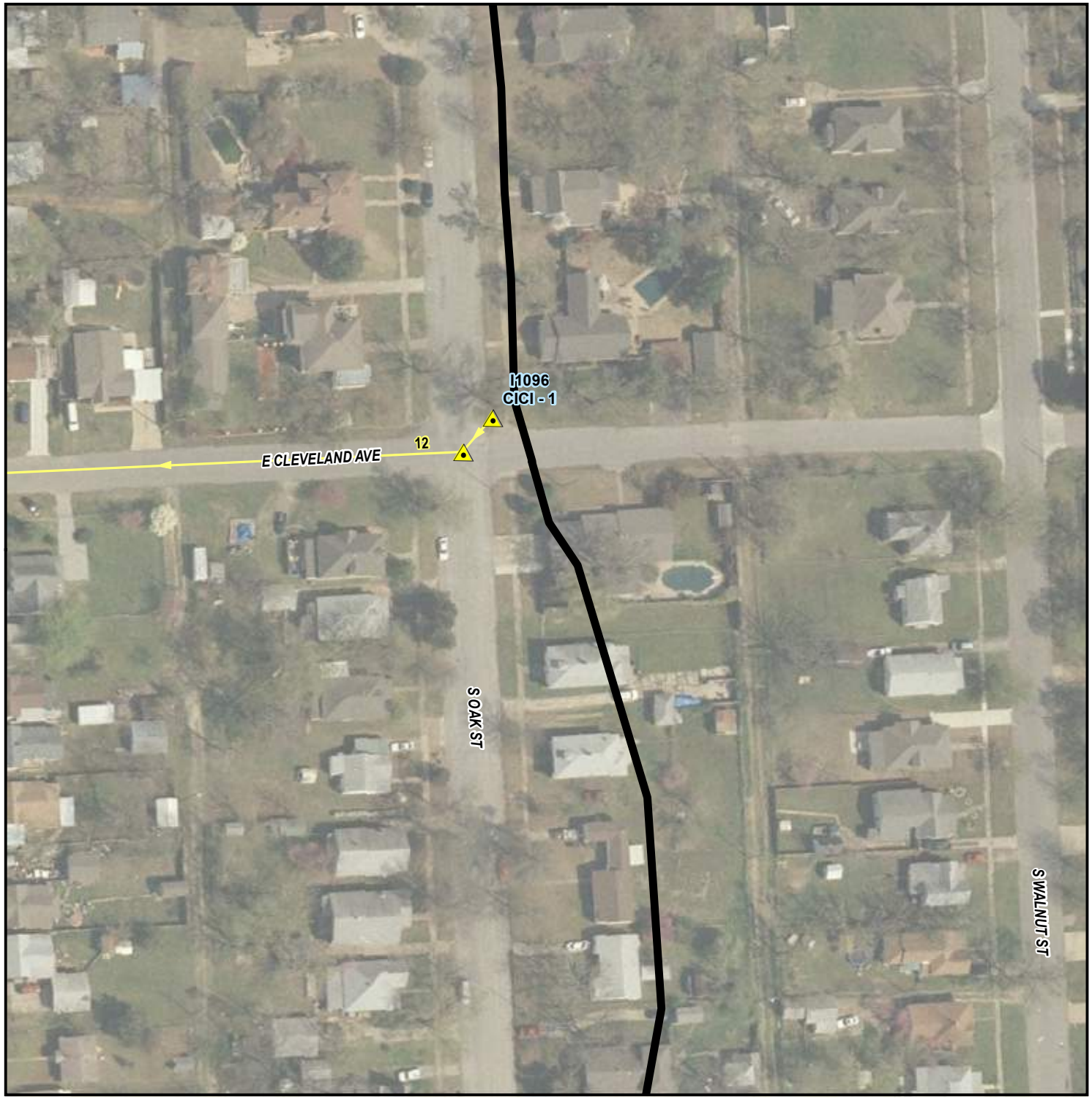

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City of Sapulpa
Downtown Inlet Analysis

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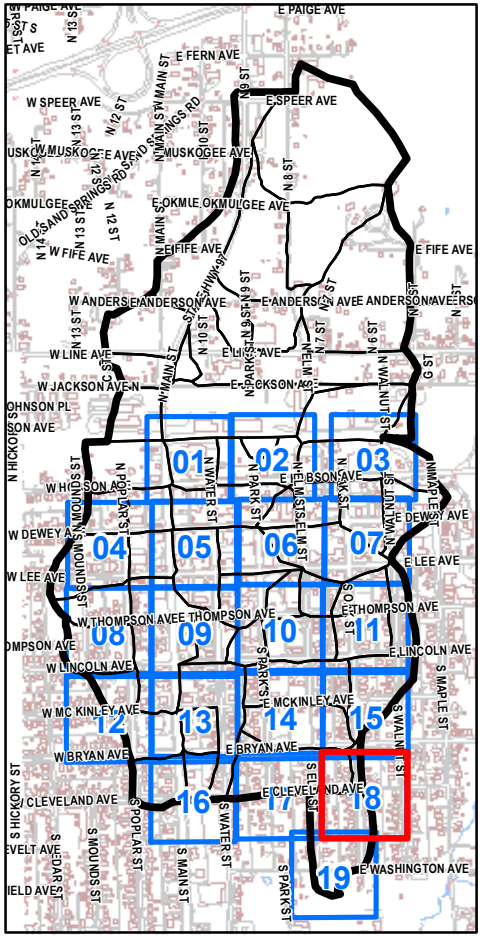

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City of Sapulpa
Downtown Inlet Analysis

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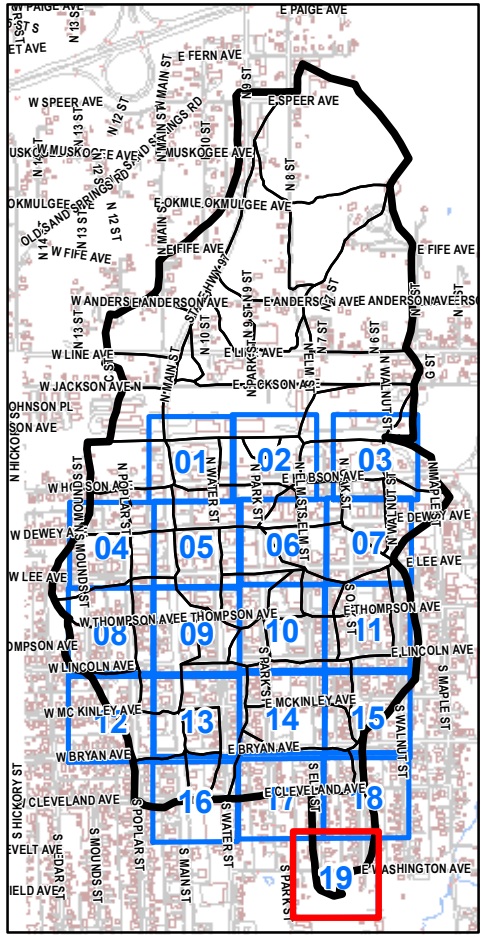

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City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Detention Pond						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**202.06(A)**	**UNCLASSIFIED EXCAVATION**	**CY**	161333	$ 12.00	$ 1,936,000.00
2	**223.06**	**TEMPORARY SILT FENCE**	**LF**	6400	$ 2.00	$ 12,800.00
3	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	55556	$ 2.50	$ 138,888.89
4	**613.06(X)**	**3'x3' RCB, C850**	**LF**	75	$ 240.00	$ 18,000.00
5	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 10,000.00	$ 10,000.00
6	**SPECIAL**	**POND OUTLET STRUCTURE**	**LS**	1	$ 20,000.00	$ 20,000.00
					Subtotal	**$ 2,135,688.89**
					15% Contingency	**$ 320,353.33**
					Subtotal	**$ 2,456,042.22**
					25% Utility Relocation Contingency	**$ 614,010.56**
					Right-Of-Way (5 ac.)	**$ 25,000.00**
					Total	***$ 3,095,052.78***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 1 Alternate 1						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	11386	$ 2.00	$ 22,772.00
2	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	1425	$ 2.50	$ 3,563.33
3	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	6165	$ 45.00	$ 277,440.00
4	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	2	$ 3,500.00	$ 7,000.00
5	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	11	$ 10,000.00	$ 110,000.00
6	**611.06(K)**	**4'x4' CURB INLET**	**EA**	78	$ 3,500.00	$ 273,000.00
7	**613.06(B)**	**36" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	452	$ 120.00	$ 54,240.00
8	**613.06(B)**	**48" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1167	$ 220.00	$ 256,740.00
9	**613.06(B)**	**66" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	783	$ 430.00	$ 336,690.00
10	**613.06(B)**	**78" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1987	$ 500.00	$ 993,500.00
11	**613.06(B)**	**90" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	567	$ 630.00	$ 357,210.00
12	**613.06(B)**	**108" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	737	$ 935.00	$ 689,095.00
13	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	22559	$ 8.00	$ 180,473.41
14	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	10681	$ 20.00	$ 213,614.34
15	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 50,000.00	$ 50,000.00
16	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	6165	$ 7.00	$ 43,157.33
					Subtotal	**$ 3,868,495.42**
					15% Contingency	**$ 580,274.31**
					Subtotal	**$ 4,448,769.73**
					25% Utility Relocation Contingency	**$ 1,112,192.43**
					Total	***$ 5,560,962.17***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 1 Alternate 2						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	202.06(A)	UNCLASSIFIED EXCAVATION	CY	4293	$ 1.00	$ 4,293.33
2	223.06	TEMPORARY SILT FENCE	LF	8240	$ 2.00	$ 16,480.00
3	411.06(A)	PAVEMENT REPLACEMENT	SY	5493	$ 45.00	$ 247,200.00
4	611.06(A)	6' I.D. MANHOLE W/ FRAME AND LID	EA	2	$ 3,500.00	$ 7,000.00
5	611.06(J)	STORM SEWER JUNCTION BOX	EA	11	$ 10,000.00	$ 110,000.00
6	611.06(K)	4'x4' CURB INLET	EA	66	$ 3,500.00	$ 231,000.00
7	613.06(B)	48" C76 CL IV RCP W/ OMNIFLEX GASKETS	LF	400	$ 220.00	$ 88,000.00
8	613.06(B)	78" C76 CL IV RCP W/ OMNIFLEX GASKETS	LF	802	$ 500.00	$ 401,000.00
9	613.06(B)	84" C76 CL IV RCP W/ OMNIFLEX GASKETS	LF	430	$ 590.00	$ 253,700.00
10	613.06(B)	90" C76 CL IV RCP W/ OMNIFLEX GASKETS	LF	1683	$ 630.00	$ 1,060,290.00
11	613.06(X)	6'x6' C850 REINFORCED CONCRETE BOX	LF	805	$ 450.00	$ 362,250.00
12	613.06(S)	TRENCH EXCAVATION	CY	11050	$ 8.00	$ 88,400.00
13	613.06(T)	STANDARD BEDDING MATERIAL	CY	7244	$ 20.00	$ 144,884.22
14	619.06(B)	REMOVAL OF STRUCTURES AND OBSTRUCTIONS	LS	1	$ 50,000.00	$ 50,000.00
15	619.06(B)	PAVEMENT REMOVAL	SY	5493	$ 7.00	$ 38,453.33
					Subtotal	**$ 3,102,950.89**
					15% Contingency	**$ 465,442.63**
					Subtotal	**$ 3,568,393.52**
					25% Utility Relocation Contingency	**$ 892,098.38**
					Total	***$ 4,460,491.90***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 1 Alternate 3						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**202.06(A)**	**UNCLASSIFIED EXCAVATION**	**CY**	2890	$ 12.00	$ 34,680.00
2	**223.06**	**TEMPORARY SILT FENCE**	**LF**	5696	$ 2.00	$ 11,392.00
3	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	1390	$ 2.50	$ 3,475.67
4	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	2451	$ 45.00	$ 110,280.00
5	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	6	$ 10,000.00	$ 60,000.00
6	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	1	$ 3,500.00	$ 3,500.00
7	**611.06(K)**	**4'x4' CURB INLET**	**EA**	36	$ 3,500.00	$ 126,000.00
8	**613.06(B)**	**48" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	818	$ 220.00	$ 179,960.00
9	**613.06(B)**	**54" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1220	$ 250.00	$ 305,000.00
10	**613.06(B)**	**60" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	300	$ 300.00	$ 90,000.00
11	**613.06(B)**	**90" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1683	$ 630.00	$ 1,060,290.00
12	**613.06(X)**	**10'x6' RCB, C850**	**LF**	510	$ 970.00	$ 494,700.00
13	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	12987	$ 8.00	$ 103,895.48
14	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	6717	$ 20.00	$ 134,342.74
15	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 20,000.00	$ 20,000.00
16	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	2451	$ 7.00	$ 17,154.67
					Subtotal	**$ 2,754,670.56**
					15% Contingency	**$ 413,200.58**
					Subtotal	**$ 3,167,871.14**
					25% Utility Relocation Contingency	**$ 791,967.79**
					Total	***$ 4,559,838.93***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 1 Alternate 4						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	8630	$ 2.00	$ 17,260.00
2	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	5753	$ 45.00	$ 258,900.00
3	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	1	$ 3,500.00	$ 3,500.00
4	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	11	$ 10,000.00	$ 110,000.00
5	**611.06(K)**	**4'x4' CURB INLET**	**EA**	72	$ 3,500.00	$ 252,000.00
6	**613.06(B)**	**48" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	818	$ 220.00	$ 179,960.00
7	**613.06(B)**	**54" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	600	$ 250.00	$ 150,000.00
8	**613.06(B)**	**72" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	802	$ 430.00	$ 344,860.00
9	**613.06(B)**	**84" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	412	$ 590.00	$ 243,080.00
10	**613.06(B)**	**90" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1683	$ 630.00	$ 1,060,290.00
11	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	12383	$ 8.00	$ 99,066.67
12	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	8154	$ 20.00	$ 163,076.06
13	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 50,000.00	$ 50,000.00
14	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	5753	$ 7.00	$ 40,273.33
					Subtotal	**$ 2,972,266.06**
					15% Contingency	**$ 445,839.91**
					Subtotal	**$ 3,418,105.97**
					25% Utility Relocation Contingency	**$ 854,526.49**
					Total	***$ 4,272,632.46***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 2 Alternate 1						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	3574	$ 2.00	$ 7,148.00
2	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	1615	$ 2.50	$ 4,036.82
3	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	4	$ 10,000.00	$ 40,000.00
4	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	1	$ 3,500.00	$ 3,500.00
5	**611.06(K)**	**4'x4' CURB INLET**	**EA**	24	$ 3,500.00	$ 84,000.00
6	**613.06(B)**	**42" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	810	$ 160.00	$ 129,600.00
7	**613.06(B)**	**54" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	137	$ 250.00	$ 34,250.00
8	**613.06(B)**	**60" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	840	$ 300.00	$ 252,000.00
9	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	3565	$ 8.00	$ 28,521.56
10	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	2146	$ 20.00	$ 42,916.84
11	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 10,000.00	$ 10,000.00
					Subtotal	**$ 635,973.22**
					15% Contingency	**$ 95,395.98**
					Subtotal	**$ 731,369.20**
					25% Utility Relocation Contingency	**$ 182,842.30**
					Total	***$ 914,211.51***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 2 Alternate 2						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**202.06(A)**	**UNCLASSIFIED EXCAVATION**	**CY**	6050	$ 12.00	$ 72,600.00
2	**223.06**	**TEMPORARY SILT FENCE**	**LF**	3530	$ 2.00	$ 7,060.00
3	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	10823	$ 2.50	$ 27,058.69
4	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	2	$ 10,000.00	$ 20,000.00
5	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	3	$ 3,500.00	$ 10,500.00
6	**611.06(K)**	**4'x4' CURB INLET**	**EA**	18	$ 3,500.00	$ 63,000.00
7	**613.06(B)**	**24" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	810	$ 70.00	$ 56,700.00
8	**613.06(B)**	**36" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	137	$ 120.00	$ 16,440.00
9	**613.06(B)**	**48" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	462	$ 220.00	$ 101,640.00
10	**613.06(B)**	**54" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	356	$ 250.00	$ 89,000.00
11	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	2674	$ 8.00	$ 21,388.25
12	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	1277	$ 20.00	$ 25,531.10
13	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 10,000.00	$ 10,000.00
					Subtotal	**$ 520,918.04**
					15% Contingency	**$ 78,137.71**
					Subtotal	**$ 599,055.74**
					25% Utility Relocation Contingency	**$ 149,763.94**
					Right-Of-Way (1.5 ac.)	**$ 7,500.00**
					Total	***$ 756,319.68***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 3 Alternate 1						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	7674	$ 2.00	$ 15,348.00
2	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	5116	$ 2.50	$ 12,790.00
3	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	8946	$ 45.00	$ 402,570.00
4	**609.06(B)**	**2'-8" NOTCHED 8" BARRIER CURB AND GUTTER**	**LF**	655	$ 25.00	$ 16,375.00
5	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	15	$ 3,500.00	$ 52,500.00
6	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	15	$ 10,000.00	$ 150,000.00
7	**611.06(K)**	**4'x4' RECESSED CURB INLET**	**EA**	33	$ 3,500.00	$ 115,500.00
8	**611.06(K)**	**8'x4' RECESSED CURB INLET**	**EA**	33	$ 5,000.00	$ 165,000.00
9	**613.06(B)**	**18" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	481	$ 46.00	$ 22,126.00
10	**613.06(B)**	**24" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	1615	$ 70.00	$ 113,050.00
11	**613.06(B)**	**30" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	815	$ 90.00	$ 73,350.00
12	**613.06(B)**	**42" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	872	$ 160.00	$ 139,520.00
13	**613.06(B)**	**48" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	54	$ 220.00	$ 11,880.00
14	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	3730	$ 8.00	$ 29,843.28
15	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	1850	$ 20.00	$ 37,003.00
16	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 150,000.00	$ 150,000.00
17	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	8946	$ 7.00	$ 62,622.00
					Subtotal	**$ 1,569,477.28**
					15% Contingency	**$ 235,421.59**
					Subtotal	**$ 1,804,898.87**
					25% Utility Relocation Contingency	**$ 451,224.72**
					Total	***$ 2,256,123.58***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 4 Alternate 1 Public Costs						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	80	$ 2.00	$ 160.00
2	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	53	$ 45.00	$ 2,400.00
3	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	1	$ 3,500.00	$ 3,500.00
4	**611.06(K)**	**SMD INLET**	**EA**	1	$ 3,500.00	$ 3,500.00
5	**613.06(B)**	**18" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	40	$ 46.00	$ 1,840.00
6	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	27	$ 8.00	$ 213.33
7	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	10	$ 20.00	$ 200.00
8	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 5,000.00	$ 5,000.00
9	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	53	$ 7.00	$ 373.33
					Subtotal	**$ 17,186.67**
					15% Contingency	**$ 2,578.00**
					Subtotal	**$ 19,764.67**
					25% Utility Relocation Contingency	**$ 4,941.17**
					Total	***$ 24,705.83***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 4 Alternate 1 Developer Costs						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	310	$ 2.00	$ 620.00
2	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	207	$ 45.00	$ 9,300.00
4	**613.06(B)**	**18" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	155	$ 46.00	$ 7,130.00
5	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	103	$ 8.00	826.67
6	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	39	$ 20.00	$ 775.00
7	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 5,000.00	$ 5,000.00
8	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	207	$ 7.00	$ 1,446.67
					Subtotal	**$ 28,598.33**
					15% Contingency	**$ 4,289.75**
					Subtotal	**$ 32,888.08**
					25% Utility Relocation Contingency	**$ 8,222.02**
					Total	***$ 41,110.10***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 5 Alternate 1						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	2000	$ 2.00	$ 4,000.00
2	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	1333	$ 45.00	$ 60,000.00
3	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	3	$ 3,500.00	$ 10,500.00
4	**611.06(K)**	**TRENCH GRATE INLET**	**EA**	1	$ 10,000.00	$ 10,000.00
5	**611.06(K)**	**4'x4' CURB INLET**	**EA**	14	$ 3,500.00	$ 49,000.00
6	**613.06(B)**	**15" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	200	$ 40.00	$ 8,000.00
7	**613.06(B)**	**21" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	200	$ 60.00	$ 12,000.00
8	**613.06(B)**	**24" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	400	$ 70.00	$ 28,000.00
9	**613.06(B)**	**30" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	200	$ 90.00	$ 18,000.00
10	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	152	$ 8.00	$ 1,219.56
11	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	381	$ 20.00	$ 7,612.00
12	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 50,000.00	$ 50,000.00
13	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	1333	$ 7.00	$ 9,333.33
					Subtotal	**$ 267,664.89**
					15% Contingency	**$ 40,149.73**
					Subtotal	**$ 307,814.62**
					25% Utility Relocation Contingency	**$ 76,953.66**
					Total	***$ 384,768.28***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 6 Alternate 1						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	1460	$ 2.00	$ 2,920.00
2	**230.06(A)**	**SOLID SLAB BERMUDA SODDING**	**SY**	67	$ 2.50	$ 166.67
3	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	760	$ 45.00	$ 34,200.00
4	**611.06(A)**	**6' I.D. MANHOLE W/ FRAME AND LID**	**EA**	3	$ 3,500.00	$ 10,500.00
5	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	4	$ 10,000.00	$ 40,000.00
6	**611.06(K)**	**4'x4' CURB INLET**	**EA**	9	$ 3,500.00	$ 31,500.00
7	**611.06(K)**	**TRENCH GRATE INLET**	**EA**	1	$ 10,000.00	$ 10,000.00
8	**613.06(B)**	**18" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	110	$ 46.00	$ 5,060.00
9	**613.06(B)**	**24" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	175	$ 70.00	$ 12,250.00
10	**613.06(B)**	**30" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	175	$ 90.00	$ 15,750.00
11	**613.06(B)**	**36" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	270	$ 120.00	$ 32,400.00
12	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	874	$ 8.00	$ 6,989.42
13	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	383	$ 20.00	$ 7,661.60
14	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 10,000.00	$ 10,000.00
15	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	760	$ 7.00	$ 5,320.00
					Subtotal	**$ 224,717.69**
					15% Contingency	**$ 33,707.65**
					Subtotal	**$ 258,425.34**
					25% Utility Relocation Contingency	**$ 64,606.34**
					Total	***$ 323,031.68***

City of Sapulpa						
Appendix 4-F. Downtown Drainage Basin Alternative Cost Estimates - Problem Area 6 Alternate 2						
ITEM	**ITEM NO.**	**DESCRIPTION**	**UNIT**	**TOTAL**	**UNIT PRICE**	**TOTAL COST**
1	**223.06**	**TEMPORARY SILT FENCE**	**LF**	1310	$ 2.00	$ 2,620.00
2	**411.06(A)**	**PAVEMENT REPLACEMENT**	**SY**	873	$ 45.00	$ 39,300.00
3	**611.06(J)**	**STORM SEWER JUNCTION BOX**	**EA**	3	$ 10,000.00	$ 30,000.00
4	**611.06(K)**	**4'x4' CURB INLET**	**EA**	7	$ 3,500.00	$ 24,500.00
5	**611.06(K)**	**TRENCH GRATE INLET**	**EA**	1	$ 10,000.00	$ 10,000.00
6	**613.06(B)**	**18" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	100	$ 46.00	$ 4,600.00
7	**613.06(B)**	**24" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	155	$ 70.00	$ 10,850.00
8	**613.06(B)**	**30" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	200	$ 90.00	$ 18,000.00
9	**613.06(B)**	**36" C76 CL IV RCP W/ OMNIFLEX GASKETS**	**LF**	200	$ 120.00	$ 24,000.00
10	**613.06(S)**	**TRENCH EXCAVATION**	**CY**	766	$ 8.00	$ 6,131.85
11	**613.06(T)**	**STANDARD BEDDING MATERIAL**	**CY**	332	$ 20.00	$ 6,638.60
12	**619.06(B)**	**REMOVAL OF STRUCTURES AND OBSTRUCTIONS**	**LS**	1	$ 10,000.00	$ 10,000.00
13	**619.06(B)**	**PAVEMENT REMOVAL**	**SY**	873	$ 7.00	$ 6,113.33
					Subtotal	**$ 192,753.79**
					15% Contingency	**$ 28,913.07**
					Subtotal	**$ 221,666.85**
					25% Utility Relocation Contingency	**$ 55,416.71**
					Total	**$ 277,083.57**