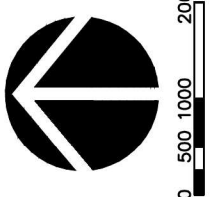




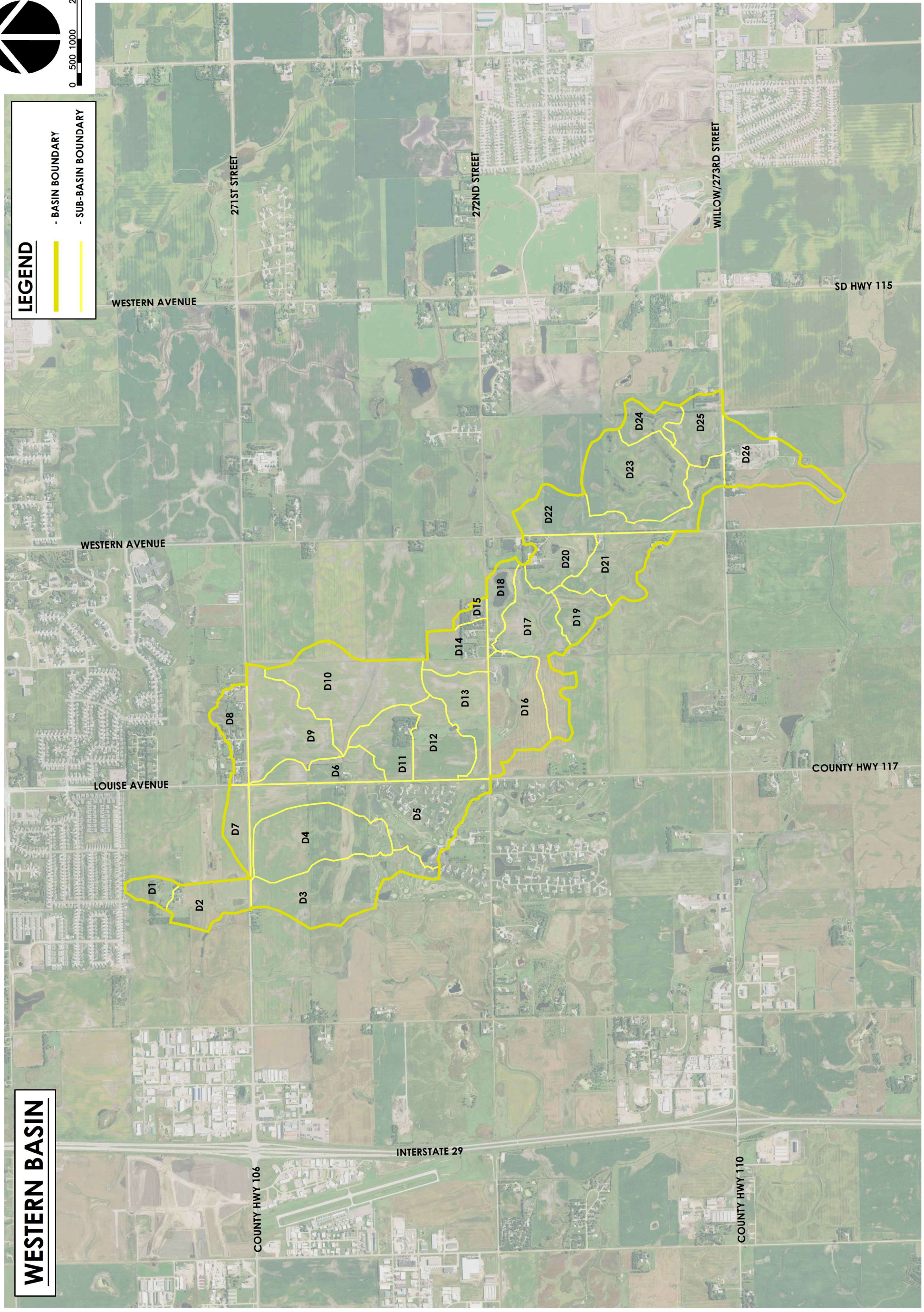
WEST HARRISBURG MASTER DRAINAGE PLAN
 COYOTE, WESTERN, HONEYSUCKLE, MINNESOTA BASINS
 HARRISBURG, SOUTH DAKOTA
 SEI PROJECT #: 18044

WESTERN BASIN



LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY

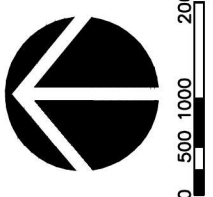


WESTERN BASIN



WEST HARRISBURG MASTER DRAINAGE PLAN
 COYOTE, WESTERN, HONEYDUCKLE, MINNESOTA BASINS
 HARRISBURG, SOUTH DAKOTA
 SEI PROJECT #: 18044

WESTERN BASIN
 EXISTING 100-YR
 INUNDATION

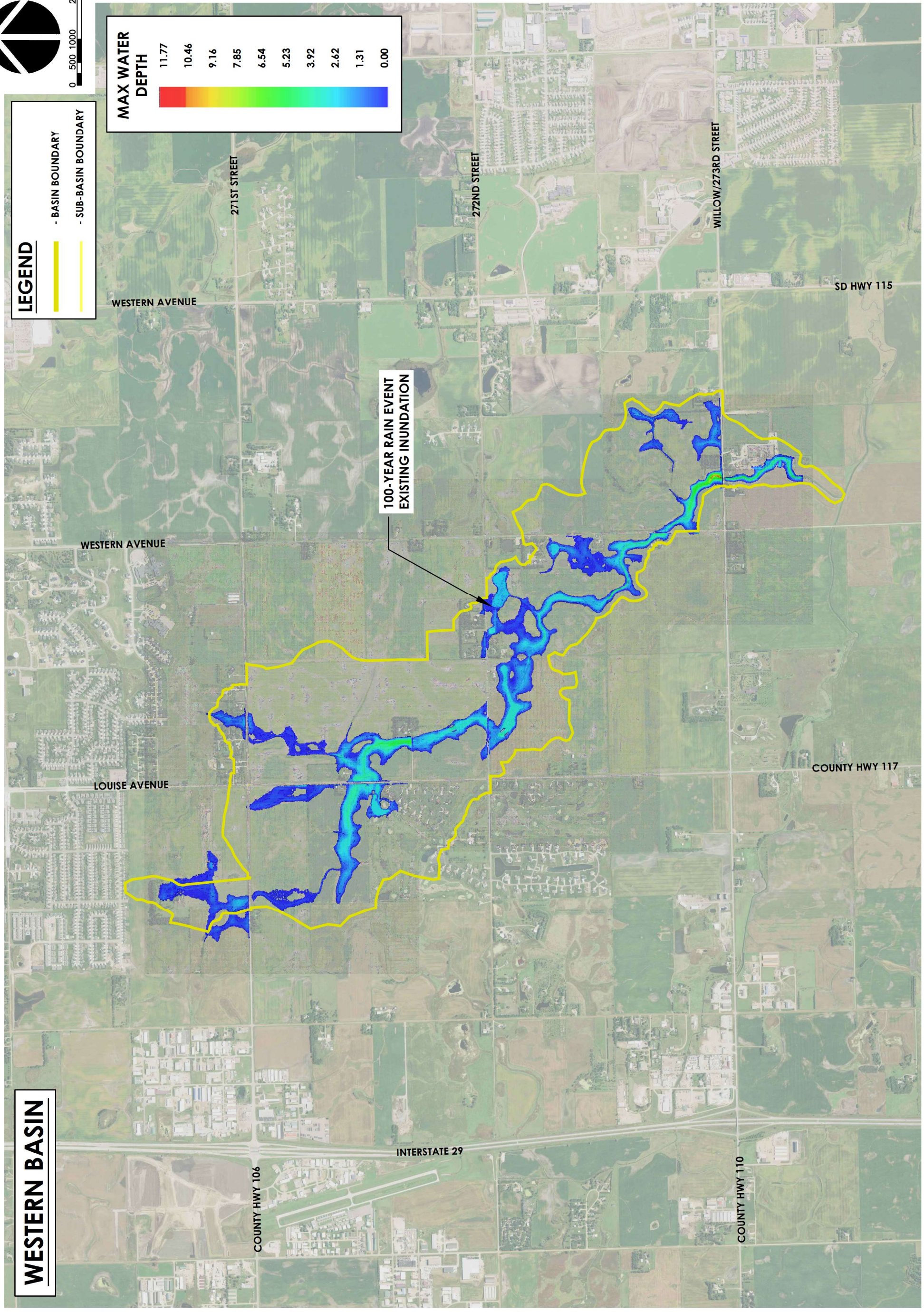


LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY

MAX WATER DEPTH

11.77
10.46
9.16
7.85
6.54
5.23
3.92
2.62
1.31
0.00

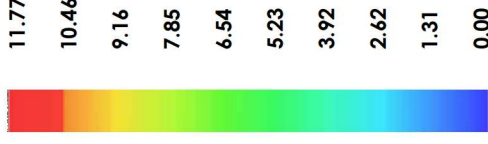


100-YEAR RAIN EVENT
 EXISTING INUNDATION

WESTERN BASIN

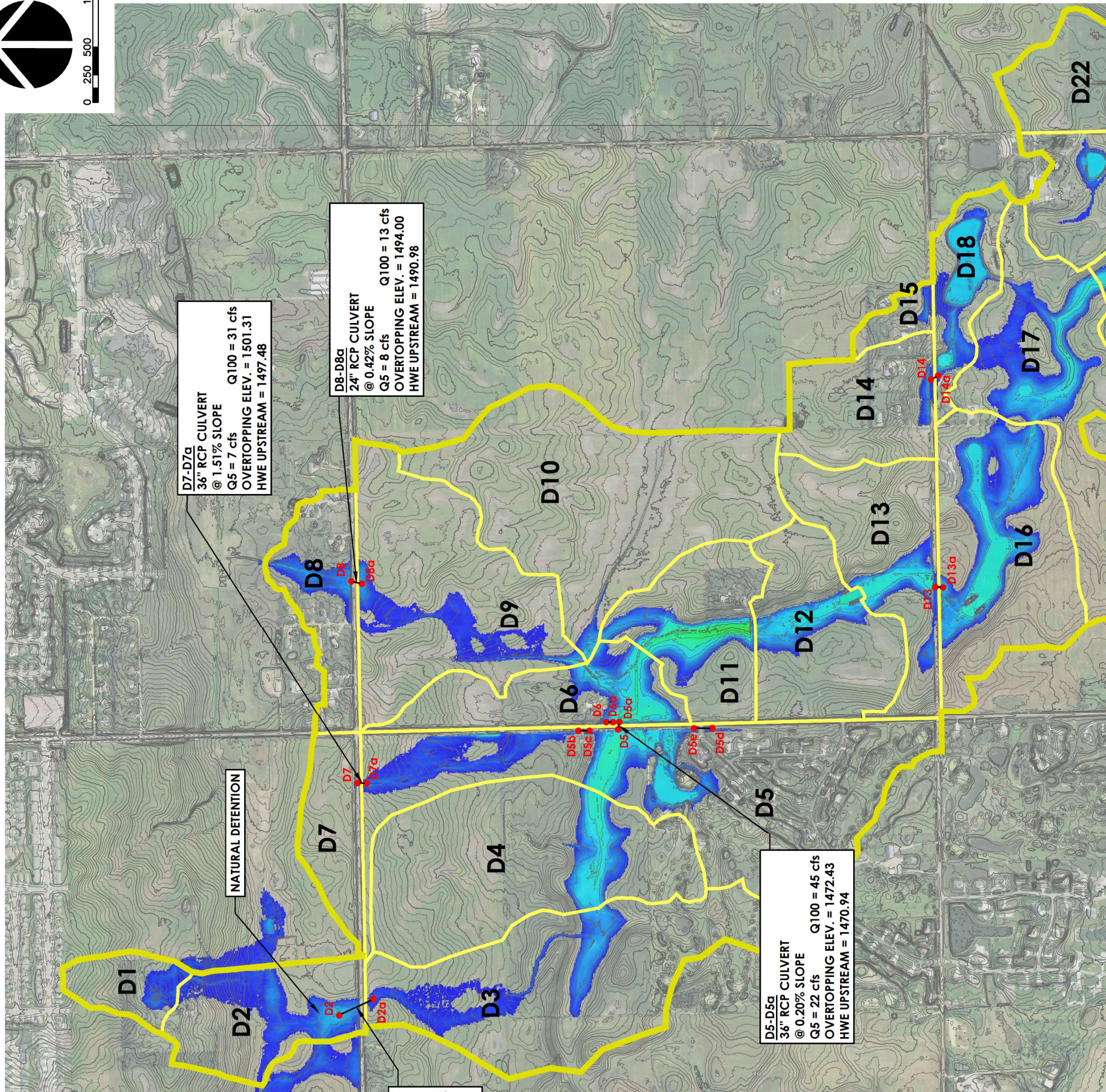
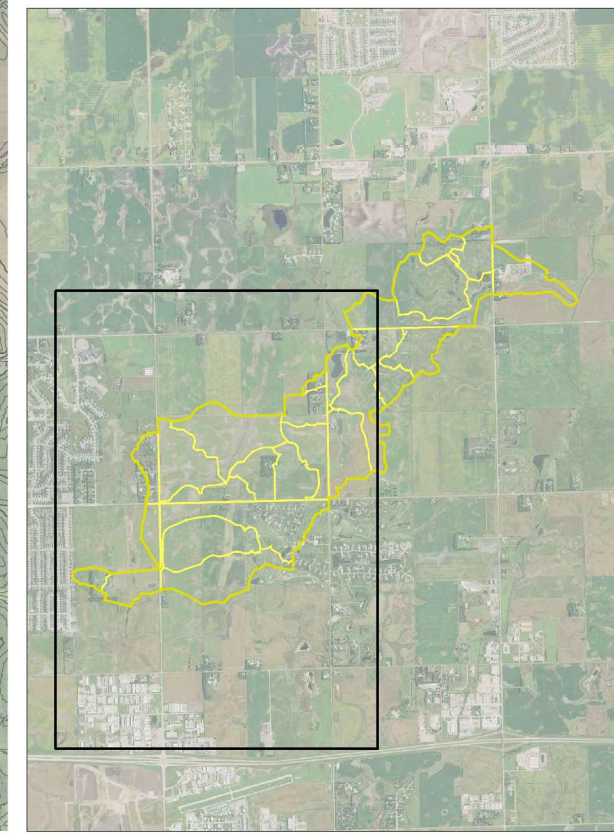
WESTERN BASIN

MAX WATER DEPTH

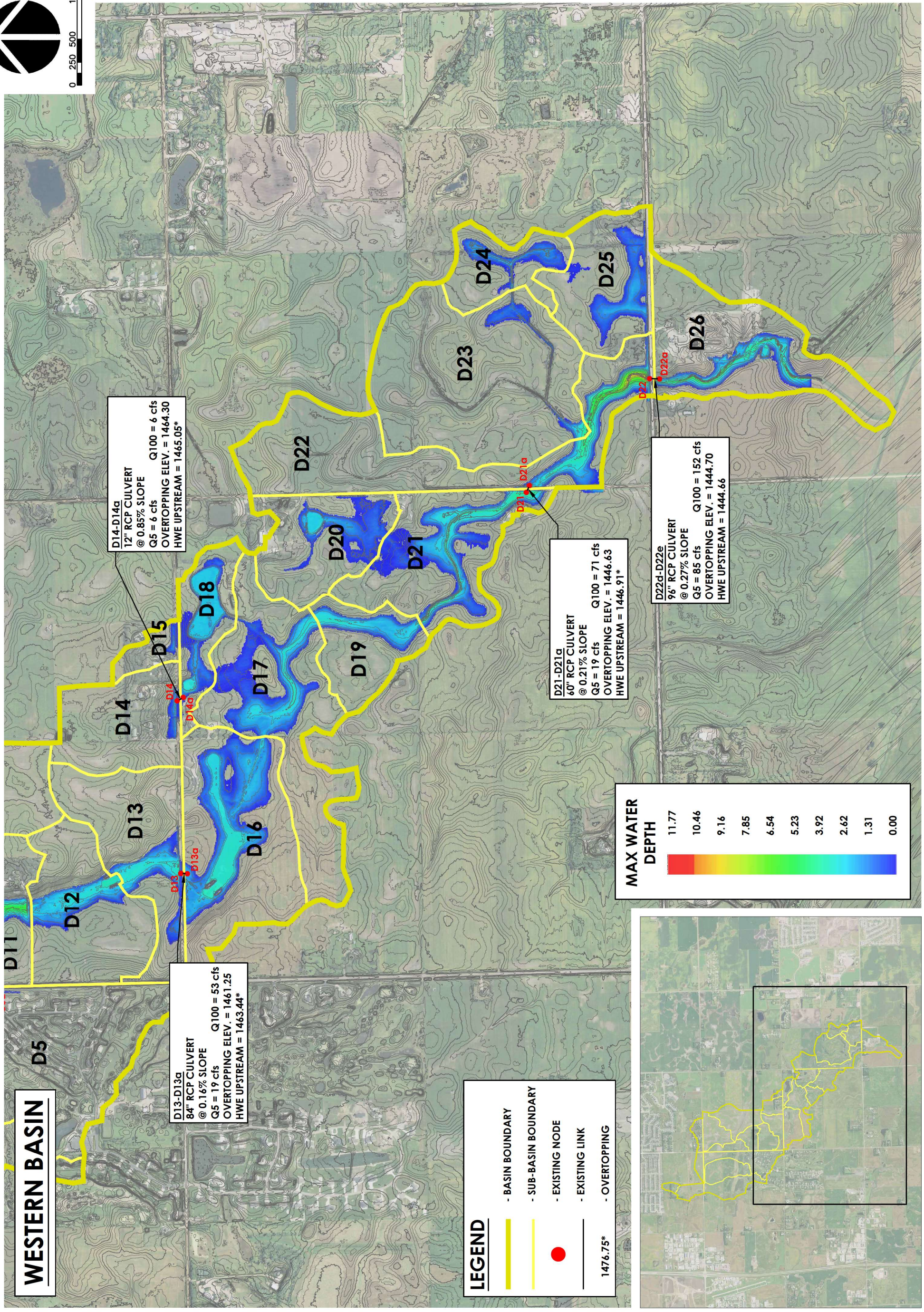
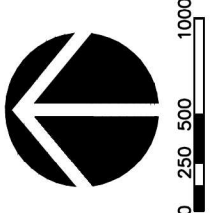


LEGEND

- BASIN BOUNDARY
 - SUB-BASIN BOUNDARY
 - EXISTING NODE
 - EXISTING LINK
 - OVERTOPPING
- 1476.75*



18044 - Western Basin Figures.dwg



WESTERN BASIN

D13-D13a
 84" RCP CULVERT
 @ 0.16% SLOPE
 Q5 = 19 cfs Q100 = 53 cfs
 OVERTOPPING ELEV. = 1461.25
 HWE UPSTREAM = 1463.44*

D14-D14a
 12" RCP CULVERT
 @ 0.85% SLOPE
 Q5 = 6 cfs Q100 = 6 cfs
 OVERTOPPING ELEV. = 1464.30
 HWE UPSTREAM = 1465.05*

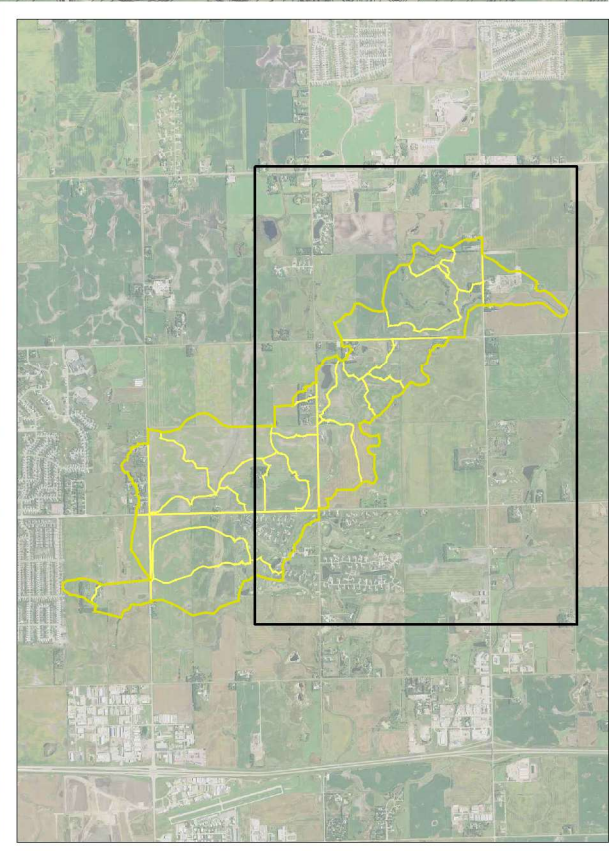
D21-D21a
 60" RCP CULVERT
 @ 0.21% SLOPE
 Q5 = 19 cfs Q100 = 71 cfs
 OVERTOPPING ELEV. = 1446.63
 HWE UPSTREAM = 1446.91*

D22-D22e
 96" RCP CULVERT
 @ 0.27% SLOPE
 Q5 = 85 cfs Q100 = 152 cfs
 OVERTOPPING ELEV. = 1444.70
 HWE UPSTREAM = 1444.66

LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- EXISTING NODE
- EXISTING LINK
- OVERTOPPING

1476.75*



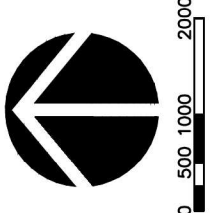


WEST HARRISBURG MASTER DRAINAGE PLAN
 COYOTE, WESTERN, HONEYDUCKLE, MINNESOTA BASINS
 HARRISBURG, SOUTH DAKOTA
 SEI PROJECT #: 18044

WESTERN BASIN
 XPSWMM
 EXISTING RESULTS

Node Name	Area ac	Curve Number	Time of Concentration (min)	5-YEAR			100-YEAR		
				Max Flow (cfs)	Max Water Depth (ft)	Max Flow (cfs)	Max Flow (cfs)	Max Water Depth (ft)	
D1	12.39	77.7	37.3	11.3	1.0	32.3	1.5		
D2	34.15	77.4	35.3	31.8	0.6	91.6	1.4		
D3	83.06	74.5	49.4	50.7	2.0	161.1	3.2		
D4	80.92	69.9	39.7	41.3	1.7	155.7	3.2		
D5	110.40	77.2	77.9	57.0	4.1	167.0	5.7		
D6	31.49	71.3	49.8	15.2	3.0	54.4	3.9		
D7	19.83	66.1	42.7	68	0.7	31.0	1.8		
D8	26.41	77.1	58.1	16.9	2.0	49.5	2.6		
D9	71.12	76.6	65.5	40.3	2.1	120.2	3.2		
D10	96.20	78.1	55.8	67.3	2.1	191.2	3.3		
D11	36.36	77.7	64.1	22.4	4.7	64.6	5.6		
D12	43.25	77.3	42.4	35.2	1.9	102.0	3.5		
D13	42.70	77.3	57.2	28.0	4.7	81.4	5.7		
D14	31.76	77.3	51.6	22.4	3.6	65.2	4.1		
D15	5.89	77.8	47.0	4.6	1.6	13.1	1.8		
D16	62.53	75.5	60.0	35.3	1.9	108.9	2.8		
D17	64.79	76.5	75.7	32.7	0.0	98.0	1.0		
D18	19.76	78.1	17.2	29.5	1.2	81.3	2.4		
D19	22.69	77.5	55.6	15.4	1.2	44.4	2.8		
D20	32.98	78.3	60.0	22.1	1.5	62.6	2.6		
D21	46.90	77.4	61.6	29.2	4.7	85.0	6.2		
D22	67.44	76.6	72.3	35.5	7.6	105.9	12.7		
D23	86.05	77.6	67.4	50.8	1.5	146.8	2.8		
D24	19.90	77.4	43.6	16.0	1.5	46.2	2.4		
D25	33.11	68.4	51.4	12.3	1.2	50.0	2.1		
D26	43.72	72.1	57.3	20.2	3.2	70.2	3.9		

Link Name	Length (ft)	Diameter (Height) ft	Shape	Conduit Slope	Roughness	Design Full Flow cfs	5-Year			100-Year						
							Upstream Node Name	Downstream Node Name	Downstream Invert Elevation ft	Upstream Invert Elevation ft	Downstream Invert Elevation ft	Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft	Max Flow cfs	Max Velocity ft/s
D2-D2a	125.0	1.25	Circular	0.71	0.013	5.5	D2	D2a	1502.00	1501.11	2.2	3.8	1502.59	5.9	4.9	1503.37
D5-D5a	62.0	3.00	Circular	0.20	0.013	29.8	D5	D5a	1465.26	1465.14	22.2	3.1	1469.37	45.3	6.4	1470.94
D5b-D5c	50.0	2.50	Circular	0.94	0.013	39.8	D5b	D5c	1470.96	1470.49	2.1	2.8	1473.25	11.6	3.5	1473.61
D5d-D5e	56.5	1.50	Circular	0.41	0.013	6.7	D5d	D5e	1468.95	1468.72	0.0	0.0	N/A	-2.0	-1.2	1470.95
D6-D6a	38.0	1.25	Circular	0.47	0.013	4.5	D6	D6a	1467.00	1466.82	8.2	6.6	1469.98	9.2	7.4	1470.89
D7-D7a	48.5	3.00	Circular	1.51	0.013	81.8	D7	D7a	1495.69	1494.96	6.8	4.9	1496.42	31.0	7.1	1497.48
D8-D8a	52.5	2.00	Circular	0.42	0.013	14.6	D8	D8a	1488.36	1488.14	7.5	2.5	1490.38	13.3	4.2	1490.98
D13-D13a	25.0	7.00	Rectangular	0.16	0.013	388.2	D13	D13a	1457.78	1457.74	19.2	0.5	1462.46	53.4	1.2	1463.44
D14-D14a	75.0	1.00	Circular	0.85	0.013	3.3	D14	D14a	1460.96	1460.32	5.6	7.0	1464.58	5.7	7.1	1465.06
D21-D21a	28.0	5.00	Rectangular	0.21	0.013	371.9	D21	D21a	1440.75	1440.69	19.0	0.4	1445.42	70.9	1.4	1446.91
D22-D22a	58.5	8.00	Rectangular	0.27	0.013	507.5	D22	D22a	1431.98	1431.82	85.4	1.7	1439.63	152.4	2.9	1444.66

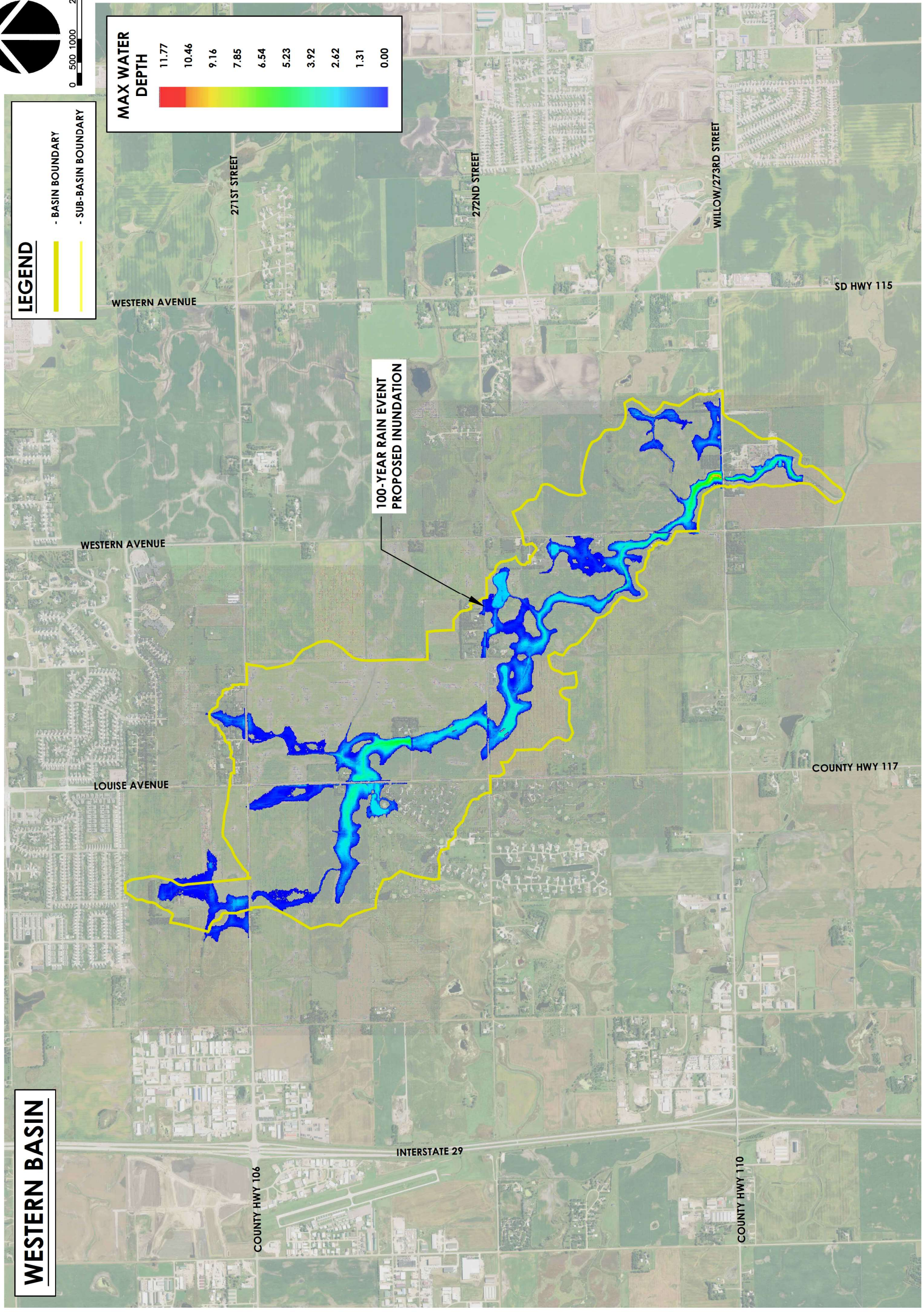


LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY

MAX WATER DEPTH

11.77
10.46
9.16
7.85
6.54
5.23
3.92
2.62
1.31
0.00



100-YEAR RAIN EVENT
 PROPOSED INUNDATION

WESTERN BASIN



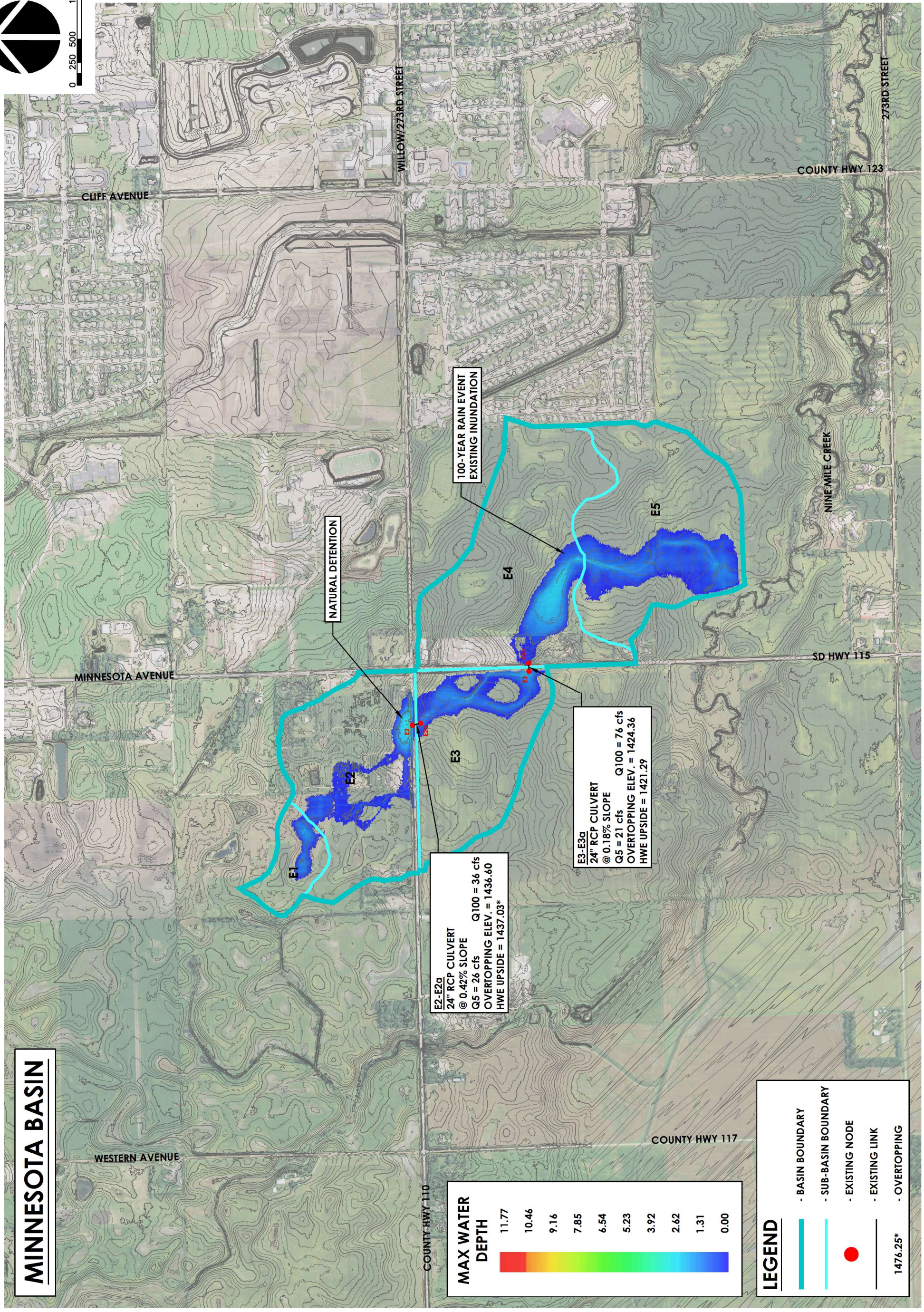
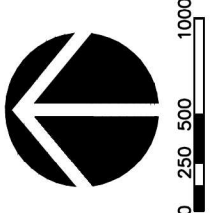
WEST HARRISBURG MASTER DRAINAGE PLAN
 COYOTE, WESTERN, HONEYDUCKLE, MINNESOTA BASINS

HARRISBURG, SOUTH DAKOTA
 SEI PROJECT #: 18044

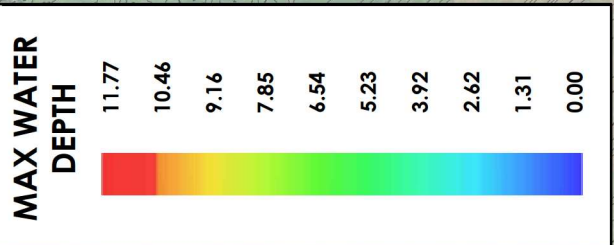
WESTERN BASIN
 XPSWMM
 PROP. RESULTS

Node Name	Area ac	Curve Number	Time of Concentration (min)	5-YEAR			100-YEAR		
				Max Flow (cfs)	Max Water Depth (ft)	Max Flow (cfs)	Max Water Depth (ft)	Max Flow (cfs)	Max Water Depth (ft)
D1	12.39	77.7	37.3	11.3	1.0	32.3	1.5		
D2	34.15	77.4	35.3	31.8	0.6	91.6	1.4		
D3	83.06	74.5	49.4	50.7	2.0	161.1	3.2		
D4	80.92	69.9	39.7	41.3	1.7	155.7	3.2		
D5	110.40	77.2	77.9	57.0	4.1	167.0	5.7		
D6	31.49	71.3	49.8	15.2	3.0	54.4	3.9		
D7	19.83	66.1	42.7	6.8	0.7	31.0	1.8		
D8	26.41	77.1	58.1	16.9	2.0	49.5	2.6		
D9	71.12	76.6	65.5	40.3	2.1	120.2	3.2		
D10	96.20	78.1	55.8	67.3	2.1	191.2	3.3		
D11	36.36	77.7	64.1	22.4	4.7	64.6	5.6		
D12	43.25	77.3	42.4	35.2	1.9	102.0	3.5		
D13	42.70	77.3	57.2	28.0	4.5	81.4	5.5		
D14	31.76	77.3	51.6	22.4	3.6	65.2	4.1		
D15	5.89	77.8	47.1	4.6	1.5	13.1	1.8		
D16	62.53	75.5	60.0	35.3	1.0	108.9	1.6		
D17	64.79	76.5	75.7	32.7	0.0	98.0	0.0		
D18	19.76	78.1	17.2	29.5	1.1	81.3	2.0		
D19	22.69	77.5	55.6	15.4	0.8	44.4	1.4		
D20	32.98	78.3	60.0	22.1	1.1	62.6	1.5		
D21	46.90	77.4	61.6	29.2	5.3	85.0	6.7		
D22	67.44	79.0	55.6	49.8	9.1	138.0	13.9		
D23	86.05	79.0	50.2	68.4	1.5	189.4	3.9		
D24	19.90	79.0	26.7	24.4	1.6	66.7	2.5		
D25	33.11	79.0	33.9	34.7	1.6	95.5	2.4		
D26	43.72	76.6	45.6	32.4	1.8	95.9	2.2		

Link Name	Length (ft)	Diameter (Height) ft	Shape	Conduit Slope	Roughness	Design Full Flow cfs	Upstream Node Name	Upstream Invert Elevation ft	Downstream Node Name	Downstream Invert Elevation ft	5-Year			100-Year		
											Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft	Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft
D2-D2a	125.0	1.25	Circular	0.71	0.013	5.5	D2	1502.00	D2a	1501.11	2.2	3.8	1502.59	5.9	4.9	1503.37
D5-D5a	62.0	3.00	Circular	0.20	0.013	29.8	D5	1465.26	D5a	1465.14	22.2	3.1	1469.37	45.3	6.4	1470.94
D5b-D5c	50.0	2.50	Circular	0.94	0.013	39.8	D5b	1470.96	D5c	1470.49	2.1	2.8	1473.25	11.6	3.5	1473.61
D5d-D5e	56.5	1.50	Circular	0.41	0.013	6.7	D5d	1468.95	D5e	1468.72	0.0	0.0	N/A	-2.0	-1.2	1470.95
D6-D6a	38.0	1.25	Circular	0.47	0.013	4.5	D6	1467.00	D6a	1466.82	8.2	6.6	1469.98	9.2	7.4	1470.89
D7-D7a	48.5	3.00	Circular	1.51	0.013	81.8	D7	1495.69	D7a	1494.96	6.8	4.9	1496.42	31.0	7.1	1497.48
D8-D8a	52.5	2.00	Circular	0.42	0.013	14.6	D8	1488.36	D8a	1488.14	7.5	2.5	1490.38	13.3	4.2	1490.98
D13-D13a	25.0	7.00	Rectangular	0.16	0.013	388.2	D13	1457.78	D13a	1457.74	19.4	0.5	1462.31	60.8	1.4	1463.28
D14-D14a	75.0	1.00	Circular	0.85	0.013	3.3	D14	1460.96	D14a	1460.32	5.8	7.3	1464.57	6.1	7.6	1465.04
D21-D21a	28.0	5.00	Rectangular	0.21	0.013	371.9	D21	1440.75	D21a	1440.69	51.3	1.0	1446.06	107.0	2.1	1447.46
D22-D22a	58.5	8.00	Rectangular	0.27	0.013	507.5	D22	1431.98	D22a	1431.82	105.5	2.0	1441.09	169.0	3.2	1445.92



MINNESOTA BASIN



LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- EXISTING NODE
- EXISTING LINK
- OVERTOPPING

1476.25*

E2-E2a
 24" RCP CULVERT
 @ 0.42% SLOPE
 Q5 = 26 cfs Q100 = 36 cfs
 OVERTOPPING ELEV. = 1436.60
 HWE UPSIDE = 1437.03*

E3-E3a
 24" RCP CULVERT
 @ 0.18% SLOPE
 Q5 = 21 cfs Q100 = 76 cfs
 OVERTOPPING ELEV. = 1424.36
 HWE UPSIDE = 1421.29

100-YEAR RAIN EVENT
 EXISTING INUNDATION

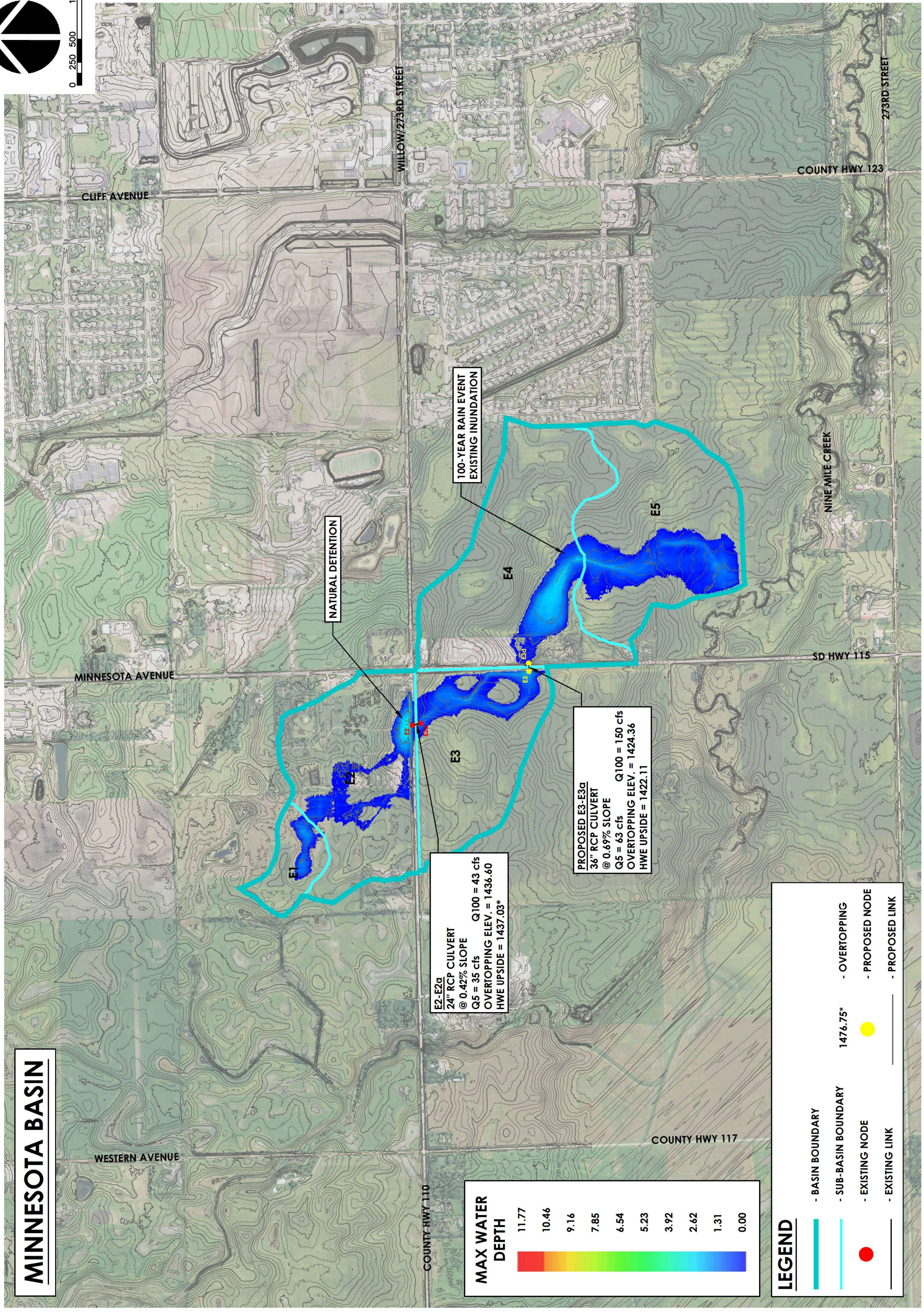
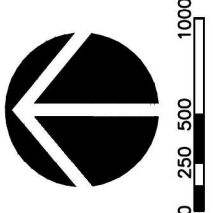
NATURAL DETENTION



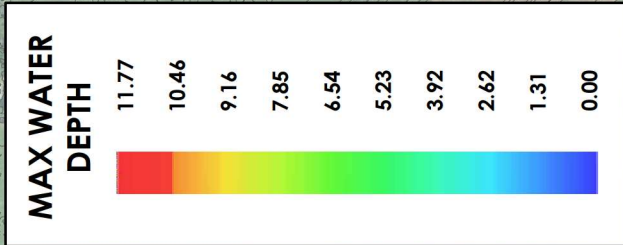
WEST HARRISBURG MASTER DRAINAGE PLAN
 COYOTE, WESTERN, HONEYDUCKLE, MINNESOTA BASINS
 HARRISBURG, SOUTH DAKOTA
 SEI PROJECT #: 18044

Node Name	5-YEAR				100-YEAR		
	Area ac	Curve Number	Time of Concentration (min)	Max Flow (cfs)	Max Water Depth (ft)	Max Flow (cfs)	Max Water Depth (ft)
E1	13.24	77.5	25.9	15.2	1.0	43.3	1.7
E2	66.18	70.6	26.3	47.6	3.8	171.3	5.6
E3	54.37	70.3	60.0	21.2	2.1	78.9	3.4
E4	87.63	70.2	43.8	42.6	1.6	159.1	2.9
E5	76.12	71.4	70.5	28.6	1.3	102.2	2.3

Link Name	Length (ft)	Diameter (Height) ft	Shape	Conduit Slope	Roughness	Design Full Flow cfs	Upstream Node Name	Upstream Invert Elevation ft	Downstream Node Name	Downstream Invert Elevation ft	5-Year			100-Year		
											Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft	Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft
E2-E2a	61.7	2.00	Circular	0.42	0.013	14.7	E2	1431.47	E2a	1431.21	25.6	8.1	1435.30	36.3	11.5	1437.03
E3-E3a	50.1	2.00	Rectangular	0.18	0.013	29.6	E3	1417.85	E3a	1417.76	21.2	1.3	1419.93	76.4	4.8	1421.29



MINNESOTA BASIN



E2-E2a
 24" RCP CULVERT
 @ 0.42% SLOPE
 Q5 = 35 cfs Q100 = 43 cfs
 OVERTOPPING ELEV. = 1436.60
 HWE UPSIDE = 1437.03*

PROPOSED E3-E3a
 36" RCP CULVERT
 @ 0.69% SLOPE
 Q5 = 63 cfs Q100 = 150 cfs
 OVERTOPPING ELEV. = 1424.36
 HWE UPSIDE = 1422.11

100-YEAR RAIN EVENT
 EXISTING INUNDATION

NATURAL DETENTION

LEGEND

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- EXISTING NODE
- EXISTING LINK
- OVERTOPPING 1476.75*
- PROPOSED NODE
- PROPOSED LINK



Node Name	5-YEAR				100-YEAR		
	Area ac	Curve Number	Time of Concentration (min)	Max Flow (cfs)	Max Water Depth (ft)	Max Flow (cfs)	Max Water Depth (ft)
E1	13.24	79.0	11.4	24.2	1.1	64.2	1.8
E2	66.18	78.7	23.0	87.4	4.5	239.8	6.1
E3	54.37	84.0	43.0	62.6	2.6	152.1	4.7
E4	87.63	81.5	31.3	110.7	1.0	284.5	1.8
E5	76.12	80.0	49.5	64.6	0.8	174.0	1.4

Link Name	Length (ft)	Diameter (Height) ft	Shape	Conduit Slope	Roughness	Design Full Flow cfs	Upstream Node Name	Upstream Invert Elevation ft	Downstream Node Name	Downstream Invert Elevation ft	5-Year			100-Year		
											Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft	Max Flow cfs	Max Velocity ft/s	Maximum Water Elevation (US) ft
E2-E2a	61.7	2.00	Circular	0.42	0.013	14.7	E2	1431.47	E2a	1431.21	35.0	11.1	1435.92	43.4	13.6	1437.52
E3-E3a	73.0	3.00	Circular	0.69	0.012	59.8	E3	1417.40	E3a	1416.90	62.8	4.8	1420.02	150.3	10.6	1422.11