

## Tables

	<u>Page</u>
1 Monthly rainfall totals	29
2 Total monthly rainfall in SMC during 2000	31
3 Monthly precipitation totals for St. Peter and SMC in 2000	31
4 Total monthly rainfall in SMC during 2001	32
5 Monthly precipitation totals for St. Peter and SMC in 2001	32
6 Land use and land cover	33
7 Percent of sub-shed by RUSLE erosion categories	44
8 Acres within 300 feet of waterway by soil loss category	44
9 Slope classes	47
10 Sub-watersheds and slope classes	47
11 Wetland characteristics	47
12 Feedlot statistics	51
13 Potential phosphorus contribution from livestock	52
14 Reporting units and methods	66
15 Interquartile range of pollutant concentrations by ecoregion	73
16 Tillage transect survey results	80
17 Total suspended solids	93
18 Nitrate nitrogen	94
19 Total phosphorus	95
20 Ortho-phosphorus	96
21 Fecal coliform bacteria	97
22 2000 and 2001 flow stats	102
23 2000 flow weighted mean concentrations	110
24 2001 flow weighted mean concentrations	110
25 2002 flow weighted mean concentrations	110
26 2000 Yield	110
27 2001 Yield	110
28 2002 Yield	110
29 Average FWMC for 2000 and 2001	111
30 Average Yield for 2000 and 2001	111
31 Tillage transect survey results and analysis	124
32 Phosphorus contributions from septic	139
33 Nitrogen mass balance for SMC	142
34 Nitrate losses from 1987-1994	149
35 Economic analysis of nitrogen rates	171
36 SMC implementation plan –cash expenditures	184
37 SMC implementation plan-in kind contributions	185

## Figures

	<u>Page</u>	
1	Water surface elevation	25
2	Average annual precipitation rates	26
3	Average annual precipitation rates, St. Peter	26
4	TSS and storm hydrograph	89
5	Nitrate-nitrogen vs. time	91
6	Total phosphorus vs. time	92
7	TSS concentrations vs. time	93
8	Nitrate concentrations vs. time	94
9	Total phosphorus concentrations vs. time	95
10	Ortho-phosphorus concentrations vs. time	96
11	Fecal coliform levels	97
12	Fecal coliform levels with upper limit reference	98
13	Early summer SMC hydrograph	100
14	Mid-summer SMC hydrograph	101
15	Late summer SMC hydrograph	101
16	Site 1 hydrograph	103
17	Site 2 hydrograph	104
18	Site 3 hydrograph	105
19	Average daily flows at each site vs. time	106
20	Percent of pollutant load by month for 2000 and 2001	113
21	TSS vs. monitoring year	114
22	Nitrate vs. monitoring year	115
23	Total phosphorus vs. monitoring year	115
24	Ortho-phosphorus vs. monitoring year	116
25	TSS yield comparison	117
26	TSS concentration comparison	118
27	Total phosphorus normalized yield for 2000	118
28	Total phosphorus for 2000	119
29	Normalized yield for nitrate nitrogen for 2000	119
30	NO <sub>3</sub> -N comparison	120
31	TSS vs. transparency	121
32	Priority areas as identified by RUSLE modeling	138
33	Sediment sources in SMC	139
34	Phosphorus sources in SMC	140
35	Nitrogen mass balance	146
36	Estimated nitrogen sources in SMC	147
37	Estimated nitrogen losses in SMC	147
38	Yield vs. concentration	155
39	Nitrate reductions at Red Top Farms	158
40	Design of nitrogen rate strips at Red Top Farms	170
41	Average corn yields for different nitrogen rates	171
42	Profitability vs. nitrogen rate	172
43	Field layout and nitrate concentrations at Red Top Farms	175

## Figures

		<u>Page</u>
44	Proposed Seven Mile Creek budget	188
45	Proposed BMP budget for Seven Mile Creek Project	188

## Maps

	<u>Page</u>	
1	SMC Watershed	3
2	Middle Minnesota Major Watershed	4
3	SMC Watershed with monitoring sites	9
4	SMC Watershed and wellhead protection area	19
5	Elevation map of SMC Watershed	22
6	Slope map of SMC Watershed	23
7	Monthly precipitation totals	30
8	1990 land use	34
9	Presettlement vegetation	35
10	Soil survey	38
11	Expected average corn yields	39
12	Expected average soybean yields	40
13	Land capability	41
14	Soil organic matter	42
15	Prime farmland	43
16	Soil erosion potential	45
17	Soil erosion potential adjacent to water bodies	46
18	Wetlands	48
19	Potentially restorable wetlands	49
20	Feedlots	53
21	Parcels with known spreading acres	54
22	Proposed location of Northern Plains Dairy	57
23	Potentially failing septics	59
24	Residential locations	61
25	Minnesota ecoregions	73
26	TSS FLUX flow weighted mean concentrations	108
27	Nitrate-Nitrogen flow weighted mean concentrations	108
28	Total phosphorus flow weighted mean concentrations	109
29	Ortho-phosphorus flow weighted mean concentrations	109
30	Tillage transect survey points and routes	125
31	Tillage transect survey results	125
32	2001 Watershed Inventories	128
33	Total Maximum Daily Loads	152
34	Middle Minnesota Major Watershed	153
35	Potential nitrogen remediation sites	177

## Photos

		<u>Page</u>
1	Seven Mile Creek near the mouth with MN River	18
2	Spring runoff conditions	28
3	Snowmelt conditions at site 2	28
4	Monitoring station at site 2	29
5	Monitoring site 1	74
6	Monitoring site 2	75
7	Monitoring site 3	76
8	Spring snowmelt at Seven Mile Creek Park	99
9	Spring snowmelt, site 1	100
10	Stream flow at site 1	107
11	Bank erosion soil samples	127
12	Stream bank erosion site	127
13	Rock inlet	181