E. Appendix E – Curve Numbers

NRCS – Land Use Runoff Curve Numbers						
Table 1: Runoff curve numbers for hydrologic soil cover (Antecedent moisture condition II, and Ia=0.25) Cover			Hydrologic Soil Group			
Land Use	Notes and % Impervious1	Hydrologic Condition	A	B	C	D
Fully Developed Urban Areas (Vegetation Established)						
Open Space (lawns, parks, golf courses, cemeteries)2:						
Grass Cover< 50%			68	79	86	89
Grass Cover 50 to 70%			49	69	79	84
Grass cover > 75%			39	61	74	80
Impervious Areas:						
Paved Parking, Driveway, Roofs	No ROW		98	98	98	98
Streets and Roads:						
Paved: Curbed and Sewers	No ROW		98	98	98	98
Paved: Open Ditches	Include ROW		83	89	92	93
Gravel	Include ROW		76	85	89	91
Dirt	Include ROW		72	82	87	89
Urban Districts:						
Commercial and Business	85		89	92	94	95
Industrial	72		81	88	91	93
Residential:						
1/8 acre or less (town houses)	65		77	85	90	92
¼ acre	38		61	75	83	87
1/3 acre	30		57	72	81	86
½ acre	25		54	70	80	85
1 acre	20		51	68	79	84
2 acres	12		46	65	77	82
Developing Urban Areas						
Newly Graded Areas 3			77	86	91	94
Agricultural Lands – Cultivated 4						
	Treatment or Practice	Hydrologic Condition 4	A	B	C	D
Fallow						
Bare Soil			77	86	91	94
Crop Residue 11		Poor	76	85	90	93
		Good	74	83	88	90
Row Crops	Straight Row	Poor	72	81	88	91
		Good	67	78	85	89
	Contoured	Poor	70	79	84	88
		Good	65	75	82	86

NRCS – Land Use Runoff Curve Numbers								
Table 1: Runoff curve numbers for hydrologic soil cover (Antecedent moisture condition II, and Ia=0.25) Cover				Hydrologic Soil Group				
	Terraced	Poor	66	74	80	82		
		Good	62	71	78	81		
Small Grain	Straight Row	Poor	65	76	84	88		
		Good	63	75	83	87		
	Contoured	Poor	63	74	82	85		
		Good	61	73	81	84		
	Terraced	Poor	61	72	79	82		
		Good	59	70	78	81		
Close-seeded Legumes or Rotation Meadow	Straight Row	Poor	66	77	85	89		
		Good	58	72	81	85		
	Contoured	Poor	64	75	83	85		
		Good	55	69	78	83		
	Terraced	Poor	63	73	80	83		
		Good	51	67	76	80		
Agricultural Lands – Other								
Pasture or Range – continuous grazing 5	Natural	Poor	68	79	86	89		
		Fair	49	69	79	84		
		Good	39	61	74	80		
	Contoured	Poor	47	67	81	88		
		Fair	25	59	75	83		
		Good	6	35	70	79		
Meadow – continuous grass, protected from grazing and generally mowed for hay.	Natural	Good	30	58	71	78		
Brush: brush-weed-grass mixture with brush as major element 6	Natural	Poor	48	67	77	83		
		Fair	35	56	70	77		
		Good	30	48	65	73		
Woods & Grass Combination (Orchard or Tree Farm 8	Natural	Poor	57	73	82	86		
		Fair	43	65	76	82		
		Good	32	58	72	79		
Woods 9	Natural	Poor	45	66	77	83		
		Fair	36	60	73	79		
		Good	257	55	70	77		
Farmsteads 10	---	---	59	74	82	86		
Roads	(dirt)	---	72	82	87	89		
	(hard surface)	---	74	84	90	92		

Notes:

1: The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4 in NRCS Technical Release 55, Urban Hydrology for Small Watersheds.

2 :CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

3: Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 in Technical Release 55, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

4: Hydrologic condition is based on combination of factors that affect infiltration and runoff, including (a) density and canopy of vegetative areas, (b) amount of year-round cover, (c) amount of grass or close-seeded legumes in rotations, (d) percentage of residue cover on the land surface (good > 20%), and (e) degree of surface roughness.

Poor: Factors impair infiltration and tend to increase runoff.

Good: Factors encourage average and better than average infiltration and tend to decrease runoff.

5:   Poor: <50% ground cover or heavily grazed with no mulch.

Fair: 50 to 75% ground cover and not heavily grazed.

Good: >75% ground cover and lightly or only occasionally grazed.

6:   Poor: <50% ground cover.

Fair: 50 to 75% ground cover.

Good: >75% ground cover.

7: Use CN = 30 for runoff computations.

8: CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

9:   Poor: Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.

Fair: Woods are grazed but not burned, and some forest litter covers the soil.

Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

10: Includes buildings, lanes, driveways and surrounding lots.

11: Crop residue cover applies only if residue is on at least 5 percent of the surface throughout the year.

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