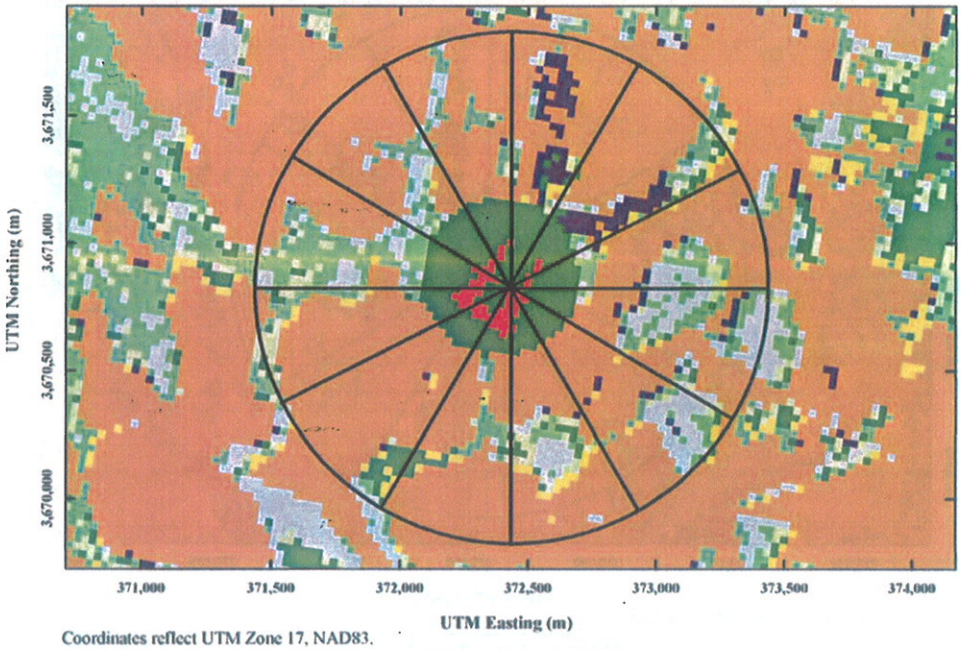
FIGURE A-1B. LAND USE CATEGORIES FOR THE 1-KM AREA SURROUNDING THE KINGS MILL FACILITY (POST-CONSTRUCTION)

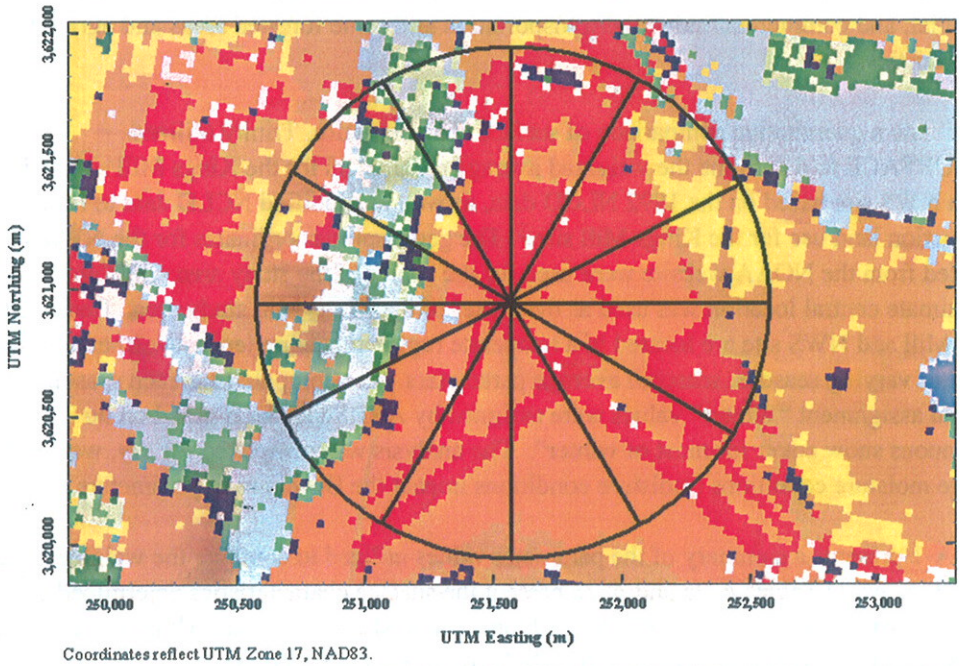



Coordinates reflect UTM Zone 17, NAD83.

**National Land Cover Dataset Classification System (NLCD92)**

- 11 - Open Water
- 21 - Low Intensity Residential
- 22 - High Intensity Residential
- 23 - Commerical/Industrial/Transportation
- 31 - Bare Rock/Sand/Clay
- 32 - Quarries/Strip Mines, Gravel Pits
- 33 - Transitional
- 41 - Deciduous Forest
- 42 - Evergreen Forest
- 43 - Mixed Forest
- 71 - Grasslands/Herbaceous
- 81 - Pasture/Hay
- 82 - Row Crops
- 85 - Fallow
- 91 - Woody Wetlands
- 92 - Emergent Herbaceous Wetlands

## FIGURE A-2. LAND USE CATEGORIES FOR THE 1-KM AREA SURROUNDING THE MACON NWS




Coordinates reflect UTM Zone 17, NAD83.

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- 71 - Grasslands/Herbaceous
- 81 - Pasture/Hay
- 82 - Row Crops
- 85 - Fallow
- 91 - Woody Wetlands
- 92 - Emergent Herbaceous Wetlands

Inspection of the land use figures shows that the land use surrounding the Kings Mill site appears to be predominantly row crops and deciduous forest. Post-construction land use will also include areas of grassland and commercial/industrial/transportation. The Macon NWS station has large areas of urban and recreation grasses as well as low and high intensity residential, and commercial/industrial/transportation and some forested areas and agricultural characteristics.

To facilitate a quantitative comparison of surface characteristics, Trinity utilized AERSURFACE to determine the weighted average parameters for the Kings Mill site and the Macon NWS site based on the 1992 NLCD data, as well as modified NCLD data to reflect post-construction land use for the Kings Mill site.[3] The geographic coordinates for the NWS site extracted from the NOAA website were used for the center of the study area while an approximate central location was used as the center of the Kings Mill study area. Because the Kings Mill and NWS site are located in a temperate region that experiences weather conditions typical of varying seasons, seasonal average parameters were computed for each season; the seasonal assignment "Winter" values were assigned by AERSURFACE based on no "continuous snow cover for most of winter". The analysis was completed for dry, wet, and average moisture conditions (moisture conditions impact the Bowen ratio parameters assigned).

Table A-1 presents a summary of the parameter values utilized to compute the weighted average parameters, while Tables A-2a and A-2b present the surface characteristics determined by AERSURFACE for the Kings Mill site, both pre- and post-construction. All parameter values are based on the values recommended in EPA's *AERMET User's Guide*.[4]

Tables A-3 through A-5 present various comparisons of the parameter assignments, considering annual averages, seasonal averages, and overall differences.[5] Figures A-3a and A-3b include a quantitative review of the land use assignments for pre-and post-construction scenarios. These comparisons illustrate that the Macon NWS station is similar to the Kings Site under post-construction conditions for albedo and Bowen ratio (when considering all moisture conditions). The Kings Mill's post-construction surface roughness parameter assignments are similar to the Macon NWS station when considered on a sector-by-sector basis, and based on the windrose shown in Figure A-4.

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[3] Approximately 75 acres of land will be cleared surrounding the process lines.

[4] EPA, *User's Guide for the AERMOD Meteorological Preprocessor (AERMET)*, EPA-454/B-03-002, November 2004.

[5] Analyses presented based on methodology recommended by the Alabama Department of Environmental Management (ADEM).

## TABLE A-1. AERMET PARAMETER VALUES

| Landuse | Albedo | | | | Surface Roughness | | | | Bowen Ratio (Average Moisture) | | | | Bowen Ratio (Dry Conditions) | | | | Bowen Ratio (Wet Conditions) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Water | 0.12 | 0.10 | 0.14 | 0.20 | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.1 | 0.1 | 0.1 | 1.5 | 0.1 | 0.1 | 0.1 | 2.0 | 0.1 | 0.1 | 0.1 | 0.3 |
| Deciduous Forest | 0.12 | 0.12 | 0.12 | 0.50 | 1.00 | 1.30 | 0.80 | 0.50 | 0.7 | 0.3 | 1.0 | 1.5 | 1.5 | 0.6 | 2.0 | 2.0 | 0.3 | 0.2 | 0.4 | 0.5 |
| Coniferous Forest | 0.12 | 0.12 | 0.12 | 0.35 | 1.30 | 1.30 | 1.30 | 1.30 | 0.7 | 0.3 | 0.8 | 1.5 | 1.5 | 0.6 | 1.5 | 2.0 | 0.3 | 0.2 | 0.3 | 0.3 |
| Swamp/Wetlands | 0.12 | 0.14 | 0.16 | 0.30 | 0.20 | 0.20 | 0.20 | 0.05 | 0.1 | 0.1 | 0.1 | 1.5 | 0.2 | 0.2 | 0.2 | 2.0 | 0.1 | 0.1 | 0.1 | 0.5 |
| Cultivated Land | 0.14 | 0.20 | 0.18 | 0.60 | 0.03 | 0.20 | 0.05 | 0.01 | 0.3 | 0.5 | 0.7 | 1.5 | 1.0 | 1.5 | 2.0 | 2.0 | 0.2 | 0.3 | 0.4 | 0.5 |
| Grassland | 0.18 | 0.18 | 0.20 | 0.60 | 0.50 | 0.10 | 0.01 | 0.001 | 0.4 | 0.8 | 1.0 | 1.5 | 1.0 | 2.0 | 2.0 | 2.0 | 0.3 | 0.4 | 0.5 | 0.5 |
| Urban | 0.14 | 0.16 | 0.18 | 0.35 | 1.00 | 1.00 | 1.00 | 1.00 | 1.0 | 2.0 | 2.0 | 1.5 | 2.0 | 4.0 | 4.0 | 2.0 | 0.5 | 1.0 | 1.0 | 0.5 |
| Desert Shrubland | 0.30 | 0.28 | 0.28 | 0.45 | 0.30 | 0.30 | 0.30 | 0.15 | 3.0 | 4.0 | 6.0 | 6.0 | 5.0 | 6.0 | 10.0 | 10.0 | 1.0 | 1.5 | 2.0 | 2.0 |

## TABLE A-2A. AERSURFACE ASSIGNMENTS FOR KINGS MILL (PRE-CONSTRUCTION)

| Sector | Albedo | | | | Surface Roughness | | | | Bowen Ratio (Average Moisture) | | | | Bowen Ratio (Dry Conditions) | | | | Bowen Ratio (Wet Conditions) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| 1 (0-30 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.077 | 0.278 | 0.278 | 0.055 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 2 (30-60 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.083 | 0.282 | 0.282 | 0.062 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 3 (60-90 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.112 | 0.370 | 0.370 | 0.079 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 4 (90-120 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.149 | 0.401 | 0.401 | 0.107 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 5 (120-150 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.057 | 0.259 | 0.259 | 0.039 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 6 (150-180 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.062 | 0.275 | 0.275 | 0.043 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 7 (180-210 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.048 | 0.252 | 0.252 | 0.032 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 8 (210-240 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.036 | 0.216 | 0.216 | 0.024 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 9 (240-270 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.063 | 0.288 | 0.288 | 0.043 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 10 (270-300 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.180 | 0.491 | 0.491 | 0.120 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 11 (300-330 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.062 | 0.283 | 0.283 | 0.042 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 12 (330-360 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.055 | 0.272 | 0.272 | 0.037 | 0.41 | 0.41 | 0.69 | 0.71 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |

## TABLE A-2B. AERSURFACE ASSIGNMENTS FOR KINGS MILL (POST-CONSTRUCTION)

| Sector | Albedo | | | | Surface Roughness | | | | Bowen Ratio (Average Moisture) | | | | Bowen Ratio (Dry Conditions) | | | | Bowen Ratio (Wet Conditions) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| 1 (0-30 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.063 | 0.179 | 0.179 | 0.029 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 2 (30-60 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.084 | 0.224 | 0.224 | 0.045 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 3 (60-90 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.089 | 0.270 | 0.270 | 0.048 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 4 (90-120 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.134 | 0.318 | 0.318 | 0.076 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 5 (120-150 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.064 | 0.232 | 0.232 | 0.036 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 6 (150-180 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.088 | 0.282 | 0.282 | 0.054 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 7 (180-210 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.087 | 0.297 | 0.297 | 0.056 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 8 (210-240 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.086 | 0.266 | 0.266 | 0.052 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 9 (240-270 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.072 | 0.240 | 0.240 | 0.037 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 10 (270-300 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.187 | 0.389 | 0.389 | 0.097 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 11 (300-330 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.078 | 0.235 | 0.235 | 0.037 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |
| 12 (330-360 deg) | 0.14 | 0.17 | 0.17 | 0.16 | 0.060 | 0.213 | 0.213 | 0.029 | 0.42 | 0.41 | 0.69 | 0.72 | 1.02 | 0.92 | 1.51 | 1.51 | 0.23 | 0.25 | 0.35 | 0.35 |

## TABLE A-3A. COMPARISON OF AERSURFACE ASSIGNMENTS, ANNUAL AVERAGES (PRE-CONSTRUCTION)

**Albedo Assignments**

| Sector | Macon NWS (MCN) Average | Kings Mill Average | Kings Mill % of MCN[1] |
|---|---|---|---|
| All | 0.160 | 0.160 | 0.0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Average Moisture**

| Sector | Macon NWS (MCN) Average | Kings Mill Average | Kings Mill % of MCN[1] |
|---|---|---|---|
| All | 0.48 | 0.56 | 16.2% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Dry Conditions**

| Sector | Macon NWS (MCN) Average | Kings Mill Average | Kings Mill % of MCN[1] |
|---|---|---|---|
| All | 0.90 | 1.24 | 38.5% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Wet Conditions**

| Sector | Macon NWS (MCN) Average | Kings Mill Average | Kings Mill % of MCN[1] |
|---|---|---|---|
| All | 0.25 | 0.30 | 18.0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Surface Roughness Assignments**

| Wind Direction | Macon NWS (MCN) Average | Kings Mill Average | Kings Mill % of MCN[1] |
|---|---|---|---|
| 30 | 0.070 | 0.172 | 146% |
| 60 | 0.076 | 0.177 | 135% |
| 90 | 0.036 | 0.233 | 551% |
| 120 | 0.037 | 0.265 | 610% |
| 150 | 0.035 | 0.154 | 342% |
| 180 | 0.025 | 0.164 | 549% |
| 210 | 0.030 | 0.146 | 395% |
| 240 | 0.051 | 0.123 | 142% |
| 270 | 0.163 | 0.171 | 4% |
| 300 | 0.130 | 0.321 | 146% |
| 330 | 0.158 | 0.168 | 6% |
| 360 | 0.152 | 0.159 | 5% |
| All | 0.080 | 0.188 | 134% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

## TABLE A-3B. COMPARISON OF AERSURFACE ASSIGNMENTS, ANNUAL AVERAGES (POST-CONSTRUCTION)

**Albedo Assignments**

| Sector | Macon NWS (MCN) Average | Facility Average | Facility % of MCN[1] |
|---|---|---|---|
| All | 0.160 | 0.160 | 0.0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Average Moisture**

| Sector | Macon NWS (MCN) Average | Facility Average | Facility % of MCN[1] |
|---|---|---|---|
| All | 0.48 | 0.56 | 17.3% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Dry Conditions**

| Sector | Macon NWS (MCN) Average | Facility Average | Facility % of MCN[1] |
|---|---|---|---|
| All | 0.90 | 1.24 | 38.5% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Wet Conditions**

| Sector | Macon NWS (MCN) Average | Facility Average | Facility % of MCN[1] |
|---|---|---|---|
| All | 0.25 | 0.30 | 18.0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Surface Roughness Assignments**

| Wind Direction | Macon NWS (MCN) Average | Facility Average | Facility % of MCN[1] |
|---|---|---|---|
| 1 | 0.070 | 0.113 | 61% |
| 2 | 0.076 | 0.144 | 91% |
| 3 | 0.036 | 0.169 | 373% |
| 4 | 0.037 | 0.212 | 468% |
| 5 | 0.035 | 0.141 | 306% |
| 6 | 0.025 | 0.177 | 599% |
| 7 | 0.030 | 0.184 | 525% |
| 8 | 0.051 | 0.168 | 230% |
| 9 | 0.163 | 0.147 | 10% |
| 10 | 0.130 | 0.266 | 104% |
| 11 | 0.158 | 0.146 | 7% |
| 12 | 0.152 | 0.129 | 15% |
| All | 0.080 | 0.166 | 107% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

## TABLE A-4A. COMPARISON OF AERSURFACE ASSIGNMENTS, SEASONAL AVERAGES (PRE-CONSTRUCTION)

**Albedo Assignments**

| | Macon NWS (MCN) | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.14 | 0.17 | 0.17 | 0.16 | 0.14 | 0.17 | 0.17 | 0.16 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 0% | 0% | 0% | 0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Average Moisture**

| | Macon NWS (MCN) | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.37 | 0.38 | 0.55 | 0.61 | 0.41 | 0.41 | 0.69 | 0.71 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 11% | 8% | 25% | 16% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Dry Conditions**

| | Macon NWS (MCN) | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.76 | 0.74 | 1.04 | 1.04 | 1.02 | 0.92 | 1.51 | 1.51 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 34% | 24% | 45% | 45% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Wet Conditions**

| | Macon NWS (MCN) | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.21 | 0.23 | 0.28 | 0.28 | 0.23 | 0.25 | 0.35 | 0.35 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 10% | 9% | 25% | 25% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Surface Roughness Assignments**

| | Macon NWS (MCN) | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.070 | 0.100 | 0.093 | 0.057 | 0.082 | 0.306 | 0.306 | 0.057 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 17% | 205% | 229% | .44% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

## TABLE A-4B. COMPARISON OF AERSURFACE ASSIGNMENTS, SEASONAL AVERAGES (POST-CONSTRUCTION)

**Albedo Assignments**

| | Macon NWS (MCN) | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.14 | 0.17 | 0.17 | 0.16 | 0.14 | 0.17 | 0.17 | 0.16 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 0% | 0% | 0% | 0% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Average Moisture**

| | Macon NWS (MCN) | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.37 | 0.38 | 0.55 | 0.61 | 0.42 | 0.41 | 0.69 | 0.72 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 14% | 8% | 25% | 18% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Dry Conditions**

| | Macon NWS (MCN) | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.76 | 0.74 | 1.04 | 1.04 | 1.02 | 0.92 | 1.51 | 1.51 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 34% | 24% | 45% | 45% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Bowen Ratio Assignments - Wet Conditions**

| | Macon NWS (MCN) | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.21 | 0.23 | 0.28 | 0.28 | 0.23 | 0.25 | 0.35 | 0.35 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 10% | 9% | 25% | 25% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

**Surface Roughness Assignments**

| | Macon NWS (MCN) | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| Seasonal Average | 0.070 | 0.100 | 0.093 | 0.057 | 0.091 | 0.262 | 0.262 | 0.050 |
| % of NWS[1] | n/a | n/a | n/a | n/a | 30% | 162% | 182% | 13% |

1. Calculated as the absolute value of (NWS average - facility average)/NWS average.

## TABLE A-5A. COMPARISON OF AERSURFACE ASSIGNMENTS, DIFFERENCES (PRE-CONSTRUCTION)

### Albedo Assignments

| | Macon NWS (MCN) | | | | Kings Mill | | | | Difference Between MCN & Kings Mill | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.14 | 0.17 | 0.17 | 0.16 | 0.14 | 0.17 | 0.17 | 0.16 | - | - | - | - | 0% | 0% | 0% | 0% |

1 Calculated as the absolute value of (NWS average - facility average)/NWS average

### Bowen Ratio Assignments - Average Moisture

| | Macon NWS (MCN) | | | | Kings Mill | | | | Difference Between MCN & Kings Mill | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.37 | 0.38 | 0.55 | 0.61 | 0.41 | 0.41 | 0.69 | 0.71 | (0.04) | (0.03) | (0.14) | (0.10) | 11% | 8% | 25% | 16% |

1 Calculated as the absolute value of (NWS average - facility average)/NWS average

### Bowen Ratio Assignments - Dry Conditions

| | Macon NWS (MCN) | | | | Kings Mill | | | | Difference Between MCN & Kings Mill | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.76 | 0.74 | 1.04 | 1.04 | 1.02 | 0.92 | 1.51 | 1.51 | (0.26) | (0.18) | (0.47) | (0.47) | 34% | 24% | 45% | 45% |

1 Calculated as the absolute value of (NWS average - facility average)/NWS average

### Bowen Ratio Assignments - Wet Conditions

| | Macon NWS (MCN) | | | | Kings Mill | | | | Difference Between MCN & Kings Mill | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.21 | 0.23 | 0.28 | 0.28 | 0.23 | 0.25 | 0.35 | 0.35 | (0.02) | (0.02) | (0.07) | (0.07) | 10% | 9% | 25% | 25% |

1 Calculated as the absolute value of (NWS average - facility average)/NWS average

### Surface Roughness Assignments

| | Macon NWS (MCN) | | | | Kings Mill | | | | Difference Between MCN & Kings Mill | | | | Kings Mill (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| 1 | 0.069 | 0.077 | 0.072 | 0.062 | 0.077 | 0.278 | 0.278 | 0.055 | -0.008 | -0.201 | -0.206 | 0.007 | 12% | 261% | 286% | 11% |
| 2 | 0.061 | 0.096 | 0.093 | 0.052 | 0.083 | 0.282 | 0.282 | 0.062 | -0.022 | -0.186 | -0.189 | -0.010 | 36% | 194% | 203% | 19% |
| 3 | 0.027 | 0.052 | 0.045 | 0.019 | 0.112 | 0.370 | 0.370 | 0.079 | -0.085 | -0.318 | -0.325 | -0.060 | 315% | 612% | 722% | 316% |
| 4 | 0.054 | 0.048 | 0.041 | 0.026 | 0.149 | 0.401 | 0.401 | 0.107 | -0.115 | -0.353 | -0.360 | -0.081 | 358% | 735% | 878% | 312% |
| 5 | 0.035 | 0.041 | 0.035 | 0.028 | 0.057 | 0.259 | 0.259 | 0.039 | -0.022 | -0.218 | -0.224 | -0.011 | 63% | 532% | 640% | 39% |
| 6 | 0.025 | 0.032 | 0.026 | 0.018 | 0.062 | 0.275 | 0.275 | 0.043 | -0.037 | -0.243 | -0.249 | -0.025 | 148% | 759% | 958% | 139% |
| 7 | 0.029 | 0.037 | 0.030 | 0.022 | 0.048 | 0.252 | 0.252 | 0.032 | -0.019 | -0.215 | -0.222 | -0.010 | 66% | 581% | 740% | 45% |
| 8 | 0.050 | 0.062 | 0.053 | 0.038 | 0.036 | 0.216 | 0.216 | 0.024 | 0.014 | -0.154 | -0.163 | 0.014 | 28% | 248% | 308% | 37% |
| 9 | 0.155 | 0.213 | 0.201 | 0.104 | 0.063 | 0.288 | 0.288 | 0.043 | 0.072 | -0.075 | -0.087 | 0.061 | 53% | 35% | 43% | 59% |
| 10 | 0.097 | 0.180 | 0.170 | 0.074 | 0.180 | 0.491 | 0.491 | 0.120 | -0.083 | -0.311 | -0.321 | -0.046 | 86% | 173% | 189% | 62% |
| 11 | 0.136 | 0.197 | 0.187 | 0.110 | 0.062 | 0.283 | 0.283 | 0.042 | 0.074 | -0.086 | -0.096 | 0.068 | 54% | 44% | 51% | 62% |
| 12 | 0.144 | 0.166 | 0.163 | 0.153 | 0.055 | 0.272 | 0.272 | 0.057 | 0.089 | -0.106 | -0.109 | 0.096 | 62% | 64% | 67% | 72% |

1 Calculated as the absolute value of (NWS average - facility average)/NWS average

## TABLE A-5B. COMPARISON OF AERSURFACE ASSIGNMENTS, DIFFERENCES (POST-CONSTRUCTION)

### Albedo Assignments

| | Macon NWS (MCN) | | | | Facility | | | | Difference Between MCN & Facility | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.14 | 0.17 | 0.17 | 0.16 | 0.14 | 0.17 | 0.17 | 0.16 | - | - | - | - | 0% | 0% | 0% | 0% |

1 Calculated as the absolute value of (NWS average - facility average) NWS average

### Bowen Ratio Assignments - Average Moisture

| | Macon NWS (MCN) | | | | Facility | | | | Difference Between MCN & Facility | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.37 | 0.38 | 0.55 | 0.61 | 0.42 | 0.41 | 0.69 | 0.72 | (0.05) | (0.03) | (0.14) | (0.11) | 14% | 8% | 25% | 18% |

1 Calculated as the absolute value of (NWS average - facility average) NWS average

### Bowen Ratio Assignments - Dry Conditions

| | Macon NWS (MCN) | | | | Facility | | | | Difference Between MCN & Facility | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.76 | 0.74 | 1.04 | 1.04 | 1.02 | 0.92 | 1.51 | 1.51 | (0.26) | (0.18) | (0.47) | (0.47) | 34% | 24% | 45% | 45% |

1 Calculated as the absolute value of (NWS average - facility average) NWS average

### Bowen Ratio Assignments - Wet Conditions

| | Macon NWS (MCN) | | | | Facility | | | | Difference Between MCN & Facility | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| All | 0.21 | 0.23 | 0.28 | 0.28 | 0.23 | 0.25 | 0.35 | 0.35 | (0.02) | (0.02) | (0.07) | (0.07) | 10% | 9% | 25% | 25% |

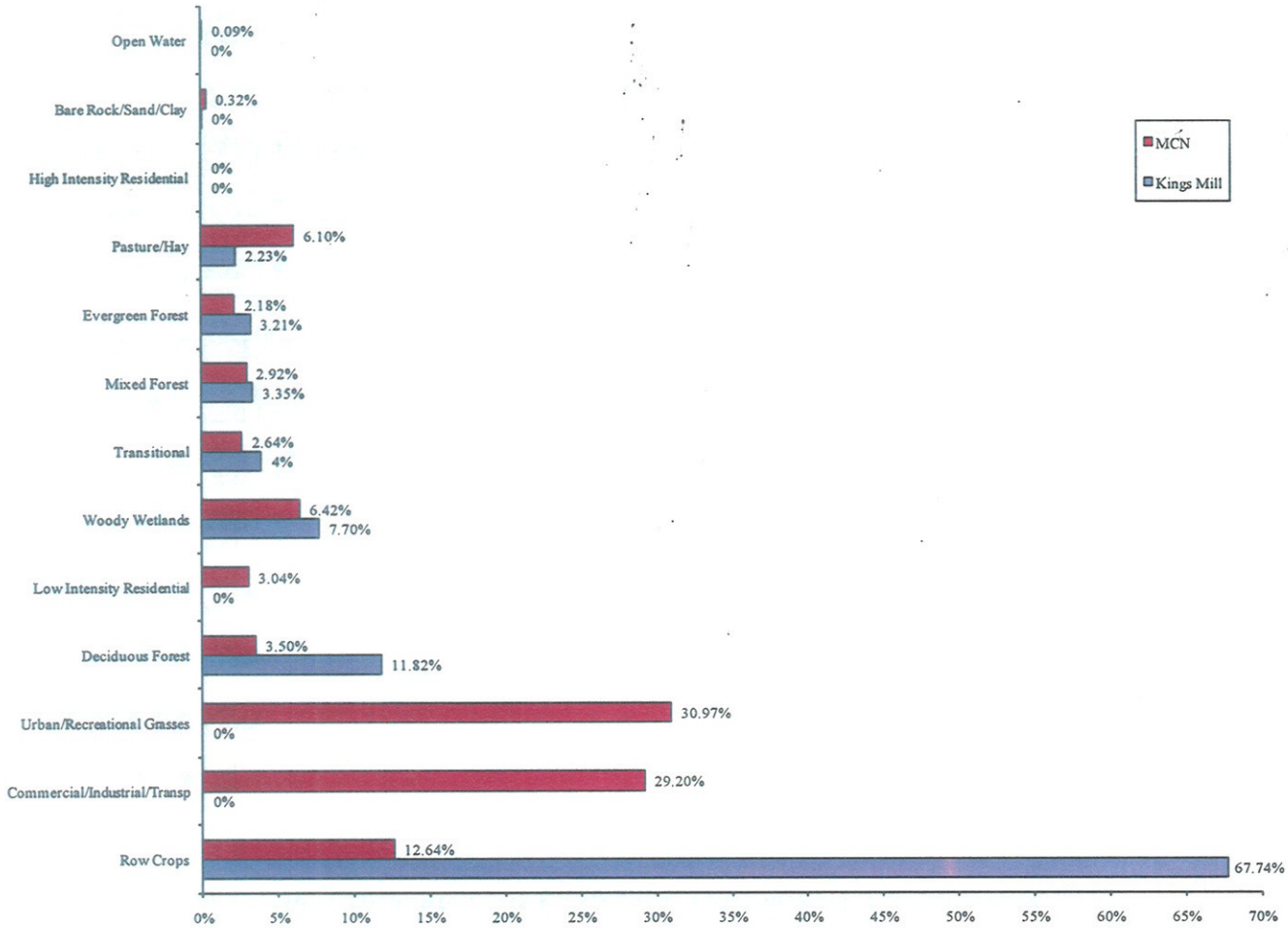
1 Calculated as the absolute value of (NWS average - facility average) NWS average

### Surface Roughness Assignments

| | Macon NWS (MCN) | | | | Facility | | | | Difference Between MCN & Facility | | | | Facility (as % of MCN)[1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sector | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter | Spring | Summer | Fall | Winter |
| 1 | 0.069 | 0.077 | 0.072 | 0.062 | 0.063 | 0.179 | 0.179 | 0.029 | 0.006 | -0.102 | -0.107 | 0.033 | 9% | 132% | 149% | 53% |
| 2 | 0.061 | 0.096 | 0.093 | 0.052 | 0.084 | 0.224 | 0.224 | 0.045 | -0.023 | -0.128 | -0.131 | 0.007 | 38% | 133% | 141% | 13% |
| 3 | 0.027 | 0.052 | 0.045 | 0.019 | 0.089 | 0.270 | 0.270 | 0.048 | -0.062 | -0.218 | -0.225 | -0.029 | 230% | 419% | 500% | 153% |
| 4 | 0.034 | 0.048 | 0.041 | 0.026 | 0.134 | 0.318 | 0.318 | 0.076 | -0.100 | -0.270 | -0.277 | -0.050 | 294% | 563% | 676% | 192% |
| 5 | 0.035 | 0.041 | 0.035 | 0.028 | 0.064 | 0.232 | 0.232 | 0.036 | -0.029 | -0.191 | -0.197 | -0.008 | 83% | 466% | 563% | 29% |
| 6 | 0.025 | 0.032 | 0.026 | 0.018 | 0.088 | 0.282 | 0.282 | 0.054 | -0.063 | -0.250 | -0.256 | -0.036 | 252% | 781% | 985% | 200% |
| 7 | 0.029 | 0.037 | 0.030 | 0.022 | 0.087 | 0.297 | 0.297 | 0.056 | -0.058 | -0.260 | -0.267 | -0.034 | 200% | 703% | 890% | 155% |
| 8 | 0.050 | 0.062 | 0.053 | 0.038 | 0.086 | 0.266 | 0.266 | 0.052 | -0.036 | -0.204 | -0.213 | -0.014 | 72% | 329% | 402% | 37% |
| 9 | 0.135 | 0.213 | 0.201 | 0.104 | 0.072 | 0.240 | 0.240 | 0.037 | 0.063 | -0.027 | -0.039 | 0.067 | 47% | 13% | 19% | 64% |
| 10 | 0.097 | 0.180 | 0.170 | 0.074 | 0.187 | 0.389 | 0.389 | 0.097 | -0.090 | -0.209 | -0.219 | -0.023 | 93% | 116% | 129% | 31% |
| 11 | 0.136 | 0.197 | 0.187 | 0.110 | 0.078 | 0.255 | 0.255 | 0.037 | 0.058 | -0.058 | -0.068 | 0.073 | 43% | 19% | 26% | 66% |
| 12 | 0.144 | 0.166 | 0.163 | 0.133 | 0.060 | 0.213 | 0.213 | 0.029 | 0.084 | -0.047 | -0.050 | 0.104 | 58% | 28% | 31% | 78% |

1 Calculated as the absolute value of (NWS average - facility average) NWS average

## FIGURE A-3A. COMPARISON OF LAND USE CATEGORIES (PRE-CONSTRUCTION)



## FIGURE A-3B. COMPARISON OF LAND USE CATEGORIES (POST-CONSTRUCTION)

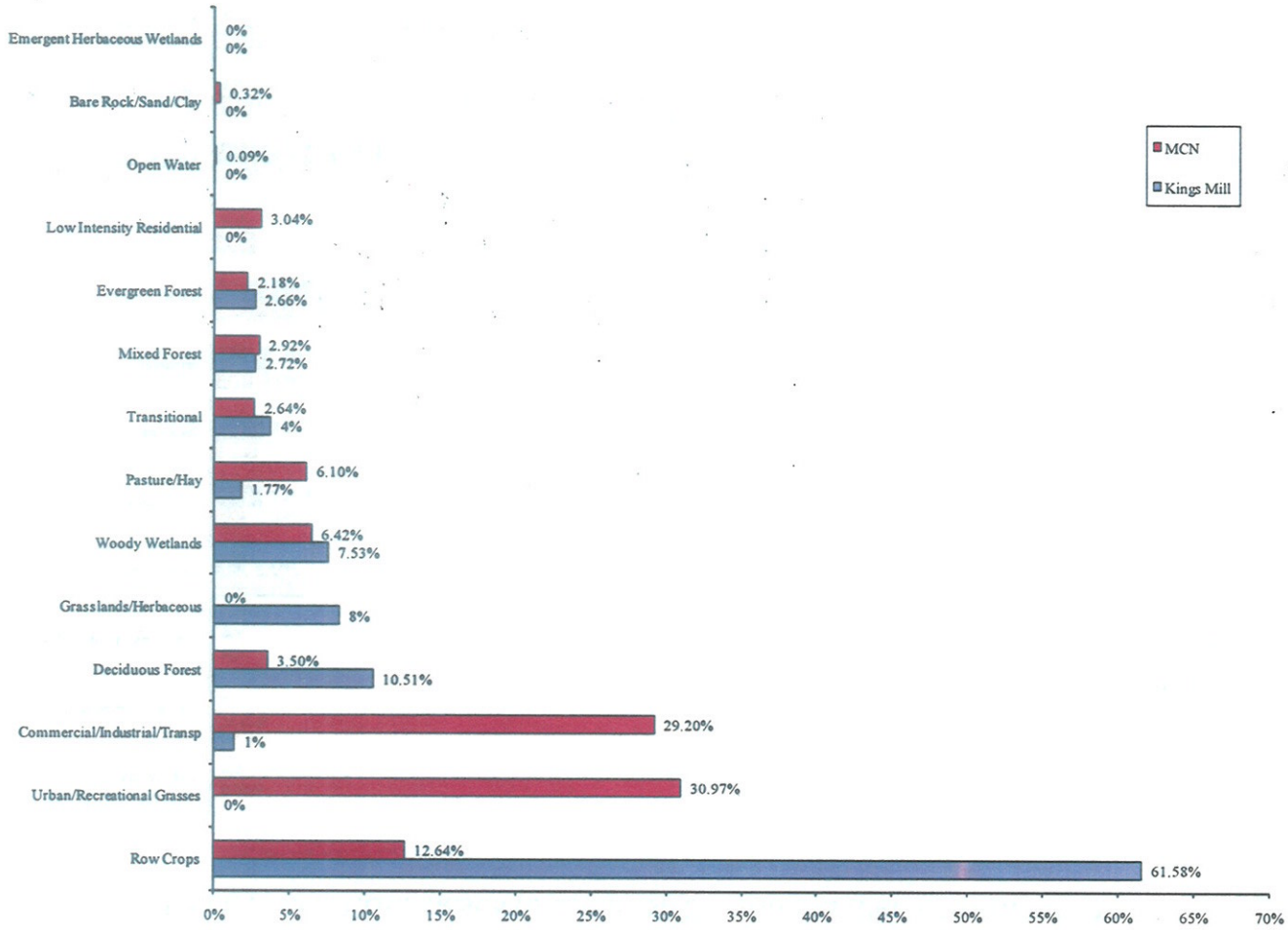


FIGURE A-4. FIVE-YEAR WINDROSE FOR MCN NWS STATION (1987-1991)