



# SOIL AND WATER CONSULTING

## Data Collection Report

Fall 2019

Date of Collection: 9/18/19

Client: Tucson Country Club



# Testing Results

|                          | <u>9/16/17</u> | <u>9/24/18</u> | <u>9/18/19</u> |
|--------------------------|----------------|----------------|----------------|
| Humidity/Air Temperature | 32%/90°        | 50%/90°        | 30%/97°        |
| Greens Temperature       | 80°            | (avg)79.75°    | (avg)75°       |
| Fairway Temperature      | 80°            | (avg)78°       | (avg)78°       |

|             | <u>Acceptable Range<br/>For Water Sample</u> | <u>Hole #8<br/>9/16/17</u> | <u>Hole #2<br/>9/24/18</u> | <u>Hole #7<br/>9/18/19</u> |
|-------------|----------------------------------------------|----------------------------|----------------------------|----------------------------|
| EC          | <2.25 mmhos/cm                               | 0.32                       | 0.41                       | 0.38                       |
| Sodium      |                                              | 27.94                      | 64.83                      | 60.38                      |
| Calcium     | 20 - 60 ppm                                  | 38.61                      | 17.79                      | 24.78                      |
| Magnesium   | 10 - 25 ppm                                  | 2.33                       | 1.33                       | 2.21                       |
| Potassium   | 5 - 20 ppm                                   | 1.76                       | 5.55                       | 1.75                       |
| Sulfur      | 30 - 90 ppm                                  | 24.71                      | 34.32                      | 26.83                      |
| Bicarbonate | <120 ppm                                     | 129.96                     | 124.55                     | 163.26                     |
| Boron       | <0.67 ppm                                    | <0.05                      | 0.09                       | 0.12                       |
| Chloride    | <177 ppm                                     | 10.55                      | 37.28                      | 27.91                      |

| <i>TEE</i> | <u>Acceptable Range<br/>For Tissue Sample</u> | <u>16<br/>9/18/19</u> |
|------------|-----------------------------------------------|-----------------------|
| Nitrogen   | 2.49%-4.56%                                   | 3.10                  |
| Phosphorus | 0.26% - 0.38%                                 | 0.29                  |
| Potassium  | 0.95% - 1.97%                                 | 1.53                  |
| Calcium    | 0.50%-0.90%                                   | 0.46                  |
| Magnesium  | 0.13%-0.16%                                   | 0.12                  |
| Sodium     | 622-1709 ppm                                  | 832.00                |

| <i>FAIRWAY</i> | <u>Acceptable Range<br/>For Tissue Sample</u> | <u>16<br/>9/18/19</u> |
|----------------|-----------------------------------------------|-----------------------|
| Nitrogen       | 2.49%-4.56%                                   | 2.85                  |
| Phosphorus     | 0.26% - 0.38%                                 | 0.30                  |
| Potassium      | 0.95% - 1.97%                                 | 1.99                  |
| Calcium        | 0.50%-0.90%                                   | 0.50                  |
| Magnesium      | 0.13%-0.16%                                   | 0.13                  |
| Sodium         | 622-1709 ppm                                  | 1,010.00              |

| <i>GREENS</i> | <u>Acceptable Range<br/>For Tissue Sample</u> | <u>7,16(avg)<br/>9/18/19</u> |
|---------------|-----------------------------------------------|------------------------------|
| Nitrogen      | 3.0%-6.5%                                     | 3.60                         |
| Phosphorus    | 0.2%-0.55%                                    | 0.48                         |
| Potassium     | 0.86%-2.55%                                   | 2.05                         |
| Calcium       | 0.21%-0.50%                                   | 0.34                         |
| Magnesium     | 0.09%-0.22%                                   | 0.14                         |
| Sodium        | 506- 2264 ppm                                 | 1,144.50                     |

| <b>TEES</b>               | <b>Acceptable Range For<br/>Alkaline Soils Sample</b> | <b>17<br/>9/16/17</b> | <b>2,11(avg)<br/>9/24/18</b> | <b>7,16(avg)<br/>9/18/19</b> |
|---------------------------|-------------------------------------------------------|-----------------------|------------------------------|------------------------------|
| Organic Matter (Humus)    | 2 - 3%                                                | 2.93                  | 2.34                         | 2.73                         |
| Sulfur                    | 12 - 16 ppm                                           | 116.00                | 35.50                        | 51.50                        |
| Olsen - Phosphorus        | 13 - 20 ppm                                           | 9.00                  | 7.50                         | 8.00                         |
| Calcium - TEC of 6 - 12   | 1,000 lbs/acre                                        | 3,044.00              | 3,821.00                     | 3,633.00                     |
| Magnesium                 | >7% base saturation or<br>at least 200 lbs/acre       | 8.52%/214             | 8.07%/239                    | 7.95%/218                    |
| Potassium - TEC of 0 - 35 | 100 ppm                                               | 202.00                | 220.50                       | 151.50                       |
| Manganese                 | 50-80 ppm                                             | n/r                   | 59.00                        | 45.00                        |

| <b>FAIRWAYS</b>           | <b>Acceptable Range For<br/>Alkaline Soils Sample</b> | <b>17<br/>9/16/17</b> | <b>2,11(avg)<br/>9/24/18</b> | <b>7,16(avg)<br/>9/18/19</b> |
|---------------------------|-------------------------------------------------------|-----------------------|------------------------------|------------------------------|
| Organic Matter (Humus)    | 2 - 3%                                                | 2.99                  | 3.00                         | 3.07                         |
| Sulfur                    | 12 - 16 ppm                                           | 49.00                 | 26.50                        | 42.50                        |
| Olsen - Phosphorus        | 13 - 20 ppm                                           | 9.00                  | 14.00                        | 16.00                        |
| Calcium - TEC of 6 - 12   | 1,000 lbs/acre                                        | 3,950.00              | 3,505.00                     | 3,365.00                     |
| Magnesium                 | >7% base saturation or<br>at least 200 lbs/acre       | 8.43%/258             | 8.29%/229                    | 9.14%/251                    |
| Potassium - TEC of 0 - 35 | 100 ppm                                               | 297.00                | 277.50                       | 330.50                       |
| Manganese                 | 50-80 ppm                                             | n/r                   | 48.00                        | 43.50                        |

| <b>GREENS</b>             | <b>Acceptable Range For<br/>Alkaline Soils Sample</b> | <b>17<br/>9/16/17</b> | <b>2,11(avg)<br/>9/24/18</b> | <b>7,16(avg)<br/>9/18/19</b> |
|---------------------------|-------------------------------------------------------|-----------------------|------------------------------|------------------------------|
| Organic Matter (Humus)    | 2 - 3%                                                | 0.66                  | 0.85                         | 0.68                         |
| Sulfur                    | 12 - 16 ppm                                           | 24.00                 | 9.50                         | 7.50                         |
| Olsen - Phosphorus        | 13 - 20 ppm                                           | 9.00                  | 10.50                        | 10.00                        |
| Calcium - TEC of 6 - 12   | 1,000 lbs/acre                                        | 2,270.00              | 1,784.00                     | 2,008.00                     |
| Magnesium                 | >7% base saturation or<br>at least 200 lbs/acre       | 9.31%/176             | 10.46%/168                   | 11.38%/206                   |
| Potassium - TEC of 0 - 35 | 150 ppm                                               | 333.00                | 328.50                       | 398.00                       |
| Manganese                 | 50-80 ppm                                             | n/r                   | 69.00                        | 79.50                        |

| <b>TEE</b>             | <b>Acceptable Range For<br/>Saturated Paste Sample</b> | <b>2<br/>9/24/18</b> | <b>16<br/>9/18/19</b> |
|------------------------|--------------------------------------------------------|----------------------|-----------------------|
| Nitrate - Bermudagrass | 10 -15 ppm                                             | 17.60                | 6.00                  |
| Phosphorus             | 2 - 10 ppm                                             | 1.34                 | 1.00                  |
| Potassium              | 40 - 100 ppm                                           | 31.78                | 19.80                 |
| Calcium                | 60 - 200 ppm                                           | 90.85                | 70.90                 |
| Magnesium              | 20 - 70 ppm                                            | 13.81                | 8.42                  |
| Sodium                 | 0 - 30 ppm                                             | 217.10               | 120.60                |
| Soluble Salts          | <1,920 ppm                                             | 854.00               | 541.00                |
| Bicarbonate            | <60 ppm                                                | 207.43               | 192.79                |
| Chloride               | <1,000 ppm                                             | 125.00               | 61.00                 |
| SAR                    | <4%                                                    | 5.61                 | 3.61                  |

| <b>FAIRWAY</b>         | <b>Acceptable Range For<br/>Saturated Paste Sample</b> | <b>2<br/>9/24/18</b> | <b>16<br/>9/18/19</b> |
|------------------------|--------------------------------------------------------|----------------------|-----------------------|
| Nitrate - Bermudagrass | 10 -15 ppm                                             | 27.70                | 9.60                  |
| Phosphorus             | 2 - 10 ppm                                             | 1.89                 | 1.27                  |
| Potassium              | 40 - 100 ppm                                           | 51.07                | 56.74                 |
| Calcium                | 60 - 200 ppm                                           | 90.67                | 65.09                 |
| Magnesium              | 20 - 70 ppm                                            | 14.95                | 10.72                 |
| Sodium                 | 0 - 30 ppm                                             | 195.56               | 156.85                |
| Soluble Salts          | <1,920 ppm                                             | 838.00               | 787.00                |
| Bicarbonate            | <60 ppm                                                | 275.77               | 266.00                |
| Chloride               | <1,000 ppm                                             | 105.00               | 91.00                 |
| SAR                    | <4%                                                    | 5.01                 | 4.75                  |

| <b>GREENS</b>           | <b>Acceptable Range For<br/>Saturated Paste Sample</b> | <b>2,11(avg)<br/>9/24/18</b> | <b>7,16(avg)<br/>9/18/19</b> |
|-------------------------|--------------------------------------------------------|------------------------------|------------------------------|
| Dominant Plus Bentgrass | 1-3 ppm                                                | <0.7                         | 2.05                         |
| Phosphorus              | 2 - 7 ppm                                              | 3.66                         | 2.86                         |
| Potassium               | 25-40 ppm                                              | 27.21                        | 22.68                        |
| Calcium                 | 50- 75 ppm                                             | 19.17                        | 13.96                        |
| Magnesium               | 15-30 ppm                                              | 4.42                         | 3.30                         |
| Sodium                  | 0 - 30 ppm                                             | 68.63                        | 41.79                        |
| Soluble Salts           | <1,000 ppm                                             | 286.00                       | 214.00                       |
| Bicarbonate             | <60 ppm                                                | 79.31                        | 102.50                       |
| Chloride                | <200 ppm                                               | 36.00                        | 20.50                        |
| SAR                     | <4%                                                    | 3.67                         | 2.61                         |