Supplemental Table 1 – Neat Standard Procurement and Storage Conditions

| Vendor                  | Standard          | CAS       | Purity (%) | Physical State | Storage Condition            |
|-------------------------|-------------------|-----------|------------|----------------|------------------------------|
| Acros Organics          | Butanoic Acid     | 107-92-6  | 99+        | Liquid         | Chemical Shelf               |
| Acros Organics          | Isovanillin       | 621-59-0  | 98         | Solid          | Chemical Shelf               |
| Acros Organics          | L-Limonene        | 5989-54-8 | 96         | Liquid         | Chemical Shelf               |
| Acros Organics          | L-Menthol         | 2216-51-5 | 99.5       | Solid          | Chemical Shelf               |
| Acros Organics          | Maltol            | 118-71-8  | 99         | Solid          | Chemical Shelf               |
| Acros Organics          | Triacetin         | 102-76-1  | 99         | Liquid         | Chemical Shelf               |
| Alfa Aesar              | Benzyl Alcohol    | 100-51-6  | 99+        | Liquid         | Chemical Shelf               |
| Alfa Aesar              | D-Limonene        | 5989-27-5 | 97         | Liquid         | Chemical Shelf               |
| Alfa Aesar              | Ethyl Vanillin    | 121-32-4  | 98         | Solid          | Chemical Shelf               |
| Alfa Aesar              | Eucalyptol        | 470-82-6  | 99         | Liquid         | Chemical Shelf               |
| Alfa Aesar              | Vanillin          | 121-33-5  | 99         | Solid          | Chemical Shelf               |
| Cambridge Isotopes      | Acenaphthene-d10  | 15067-26-2| 99         | Solid          | Chemical Shelf               |
| Cambridge Isotopes      | Benzene-d6        | 1076-43-3 | 99.5       | Liquid         | Chemical Shelf               |
| Cambridge Isotopes      | Chlorobenzene-d5  | 3114-55-4 | 99         | Liquid         | Chemical Shelf               |
| Cambridge Isotopes      | Pyridine-d5       | 7291-22-7 | 99.5       | Liquid         | Chemical Shelf               |
| Santa Cruz Biotechnology| Acetoin           | 513-86-0  | 97         | Solid          | 4-8°C                        |
| Santa Cruz Biotechnology| Naphthalene-d8    | 1146-65-2 | NA         | Solid          | Chemical Shelf               |
| Sigma Aldrich           | Benzaldehyde      | 100-52-7  | 99.5       | Liquid         | Chemical Shelf, under argon  |
| Sigma Aldrich           | Eugenol           | 97-53-0   | 99         | Liquid         | Chemical Shelf               |
| Sigma Aldrich           | Furaneol          | 3658-77-3 | 99         | Solid          | 4-8°C, under argon            |
| Sigma Aldrich           | Methyl Salicylate | 119-36-8  | 99         | Liquid         | Chemical Shelf               |
| TCI                     | (+)Pulegone        | 89-82-7   | 95         | Liquid         | Chemical Shelf               |
| TCI                     | 2,3,5-Trimethylpyrazine | 14667-55-1| 98         | Liquid         | Chemical Shelf               |
| TCI                     | Ethyl Maltol      | 4940-11-8 | 99         | Solid          | Chemical Shelf               |
| TCI                     | Ethyl Salicylate  | 118-61-6  | 99         | Liquid         | Chemical Shelf               |
| TCI                     | trans-Cinnamaldehyde | 14371-10-9| 98         | Liquid         | Chemical Shelf               |
### Supplemental Table 2 – Preparation Information for Calibration and Quality Control (QC) Standards

| Standard ID | Volume of Neat Standard (μL) | Volume of 20mg/mL Working Solution² (μL) | Volume of Previous Calibration Level (μL) | Volume of 50:50 PG:VG (5% H2O) (μL) | Total Volume (μL) | Concentration (mg/mL) |
|-------------|-----------------------------|----------------------------------------|------------------------------------------|-------------------------------------|------------------|-----------------------|
| C10         | 100, each¹                  | 5000                                   | NA                                       | 3700                                | 10,000           | 10.0                  |
| C9          | ---                         | ---                                    | 5000 (of C10)                            | 5000                                | 10,000           | 5.00                  |
| C8          | ---                         | ---                                    | 5000 (of C9)                             | 5000                                | 10,000           | 2.50                  |
| C7          | ---                         | ---                                    | 5000 (of C8)                             | 5000                                | 10,000           | 1.25                  |
| C6          | ---                         | ---                                    | 5000 (of C7)                             | 5000                                | 10,000           | 0.63                  |
| C5          | ---                         | ---                                    | 5000 (of C6)                             | 5000                                | 10,000           | 0.31                  |
| C4          | ---                         | ---                                    | 5000 (of C5)                             | 5000                                | 10,000           | 0.16                  |
| C3          | ---                         | ---                                    | 5000 (of C4)                             | 5000                                | 10,000           | 0.08                  |
| C2          | ---                         | ---                                    | 5000 (of C3)                             | 5000                                | 10,000           | 0.04                  |
| C1          | ---                         | ---                                    | 5000 (of C2)                             | 5000                                | 10,000           | 0.02                  |
| C0          | ---                         | ---                                    | ---                                       | 5000                                | 10,000           | 0.00                  |
| QC9         | 80, each¹                   | 4000                                   | NA                                       | 4960                                | 10,000           | 8.00                  |
| QC8         | ---                         | ---                                    | 5000 (of QC9)                            | 5000                                | 10,000           | 4.00                  |
| QC7         | ---                         | ---                                    | 5000 (of QC8)                            | 5000                                | 10,000           | 2.00                  |
| QC6         | ---                         | ---                                    | 5000 (of QC7)                            | 5000                                | 10,000           | 1.00                  |
| QC5         | ---                         | ---                                    | 5000 (of QC6)                            | 5000                                | 10,000           | 0.50                  |
| QC4         | ---                         | ---                                    | 5000 (of QC5)                            | 5000                                | 10,000           | 0.25                  |
| QC3         | ---                         | ---                                    | 5000 (of QC4)                            | 5000                                | 10,000           | 0.13                  |
| QC2         | ---                         | ---                                    | 5000 (of QC3)                            | 5000                                | 10,000           | 0.06                  |
| QC1         | ---                         | ---                                    | 5000 (of QC2)                            | 5000                                | 10,000           | 0.03                  |

¹Refer to Supplemental Table 1 for each liquid neat standard to be added

²Prepared by weighting 2.0000 ± 0.0005mg of each neat solid standard (see Supplemental Table 1) into 100mL of methanol and hand-vortex 5 min, or until visible granules are dissolved.
| Chemical                  | Instrument Linear Range<sup>1</sup> (mg/mL) | Working Calibration Range<sup>2</sup> (mg/mL) | Calibration Curve Fit | Average<sup>3</sup> Coefficient of Determination (r<sup>2</sup>) | Average<sup>3</sup> RRF | Average<sup>3</sup> RRT | Average<sup>3</sup> RSE (%) | LLOQ (mg/mL) | S:N<sup>4</sup> at LLOQ |
|---------------------------|---------------------------------------------|----------------------------------------------|-----------------------|---------------------------------------------------------------|--------------------------|---------------------------|-----------------------------|-----------------|-------------------------|
| Acetoin                   | 0.31-10.00                                  | 0.31-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.03                     | 1.24                      | 6.9                         | 0.31            | 715                     |
| Butanoic Acid             | 0.16-10.00                                  | 0.63-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.34                     | 1.13                      | 7.2                         | 0.63            | 59                      |
| Benzaldehyde              | 0.02-10.00                                  | 0.02-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.996                                                         | 0.56                     | 1.12                      | 6.7                         | 0.02            | 45                      |
| 2,3,5-Trimethylpyrazine   | 0.02-10.00                                  | 0.02-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.70                     | 1.24                      | 7.9                         | 0.02            | 846                     |
| DL-Limonene               | 0.08-10.00                                  | 0.08-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.993                                                         | 0.14                     | 1.26                      | 8.3                         | 0.08            | 891                     |
| Eucalyptol                | 0.04-10.00                                  | 0.04-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.09                     | 1.29                      | 7.0                         | 0.04            | 438                     |
| Benzyl Alcohol            | 0.02-5.00                                   | 0.02-5.00                                   | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.54                     | 1.35                      | 7.1                         | 0.02            | 164                     |
| Furaneol                  | 0.02-5.00                                   | 0.02-5.00                                   | Quadratic, 1/x<sup>2</sup> | 0.994                                                         | 0.25                     | 1.37                      | 7.8                         | 0.02            | 35                      |
| Maltol                    | 0.16-10.00                                  | 0.63-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.992                                                         | 0.49                     | 1.47                      | 8.9                         | 0.63            | 580                     |
| L-Menthol                 | 0.08-10.00                                  | 0.08-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.997                                                         | 0.08                     | 1.51                      | 5.6                         | 0.08            | 631                     |
| Methyl Salicylate         | 0.08-10.00                                  | 0.08-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.993                                                         | 0.36                     | 1.00                      | 8.5                         | 0.08            | 2212                    |
| Ethyl Maltol              | 0.08-10.00                                  | 0.63-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.992                                                         | 0.24                     | 1.02                      | 8.4                         | 0.63            | 492                     |
| (+)Pulegone               | 0.02-10.00                                  | 0.02-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.19                     | 1.04                      | 6.5                         | 0.02            | 1256                    |
| Ethyl Salicylate          | 0.02-10.00                                  | 0.02-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.993                                                         | 0.37                     | 1.06                      | 8.2                         | 0.02            | 1986                    |
| trans-Gingaldehyde        | 0.02-5.00                                   | 0.16-5.00                                   | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.33                     | 1.09                      | 7.7                         | 0.16            | 157                     |
| Triacetin                 | 0.02-10.00                                  | 0.04-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.997                                                         | 0.18                     | 1.12                      | 5.7                         | 0.04            | 10                      |
| Eugenol                   | 0.04-10.00                                  | 0.04-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.994                                                         | 0.38                     | 1.15                      | 7.6                         | 0.04            | 652                     |
| Vanillin                  | 0.31-10.00                                  | 0.63-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.994                                                         | 0.24                     | 1.26                      | 7.9                         | 0.63            | 159                     |
| Ethyl Vanillin            | 0.04-10.00                                  | 0.31-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.995                                                         | 0.14                     | 1.32                      | 7.3                         | 0.31            | 1125                    |
| Isovanillin               | 0.04-10.00                                  | 0.31-10.00                                  | Quadratic, 1/x<sup>2</sup> | 0.994                                                         | 0.28                     | 1.02                      | 7.7                         | 0.31            | 162                     |

<sup>1</sup>Determined from percent recovery values (±20%) of each calibrator

<sup>2</sup>Determined from method validation parameters, including LLOQ and carryover analysis and represents calibration range applicable to quantitation of e-cigarette liquids

<sup>3</sup>Average of 7 independent batches analyzed across 7 days

<sup>4</sup>S:N = Signal/Noise ratio. Value calculated and provided by automated instrument software during data analysis. Acceptable peak identification from baseline noise is considered 10:1.
### Supplemental Table 4 – Average Recovery and Coefficient of Variation (CV) Across 7 Calibration Batches

| Level | Expected Concentration (mg/mL) | Initial Calibration | Quality Control |
|-------|--------------------------------|---------------------|-----------------|
|       | 0.02 0.04 0.08 0.16 0.31 0.63 1.25 2.5 5.0 10.0 | 0.0 0.1 0.3 0.2 0.5 1.0 2.0 4.0 8.0 |
| Acetoin | 0 15 41 74 | 101 97 99 102 100 100 | 0 12 43 67 |
| Butanoic Acid | 30 26 88 | 102 95 97 99 106 107 96 | 25 26 78 |
| Benzaldehyde | 99 99 95 98 100 106 107 104 94 | 91 94 93 93 95 100 102 102 96 |
| 2,3,5-Trimethylpyrazine | 105 96 94 95 96 99 109 110 104 91 | 95 90 90 91 94 101 105 102 92 |
| DL-Limonene | 55 90 | 97 99 99 98 98 98 108 97 | 58 81 102 100 105 103 102 111 105 |
| Eucalyptol | 87 99 99 100 98 100 101 101 102 99 | 90 99 96 98 99 98 98 102 96 |
| Benzyl Alcohol | 93 102 100 95 98 97 105 108 104 | 67 102 94 92 94 96 102 108 107 71 |
| Furaneol | 102 88 100 97 102 102 106 104 96 13 | 104 105 95 101 103 106 104 105 14 |
| Maltol | 45 55 86 | 93 94 96 104 111 108 93 | 43 56 79 |
| L-Menthol | 73 82 | 100 100 101 98 102 101 101 101 100 |
| Methyl Salicylate | 85 85 | 95 93 97 100 107 111 106 92 | 61 87 99 99 100 100 100 101 100 |
| Ethyl Maltol | 45 71 | 100 91 95 96 104 109 110 94 | 82 81 94 95 104 107 107 96 |
| (+)Pulegone | 98 99 103 95 100 97 101 104 106 96 | 98 93 95 93 98 105 109 113 100 |
| Ethyl Salicylate | 99 95 94 97 97 100 107 112 107 94 | 104 94 103 98 98 101 103 104 104 99 |
| trans-Cinnamaldehyde | 99 98 97 97 101 101 107 104 94 14 | 13 97 95 97 100 104 106 102 14 |
| Triacetin | 100 98 98 99 98 100 101 104 104 97 | 93 94 95 93 96 96 99 102 97 |
| Eugenol | 86 95 95 95 97 100 106 110 108 92 | 87 96 94 96 99 106 110 112 99 |
| Vanillin | 71 70 70 81 | 96 101 101 105 108 95 | 67 65 66 80 |
| Ethyl Vanillin | 91 95 97 96 96 100 103 106 108 95 | 96 99 95 94 95 102 104 110 99 |
| Isovanillin | 90 98 97 95 96 100 104 106 107 94 | 92 95 92 95 99 101 104 108 97 |
| Benzene-d6 | 107 104 103 103 102 103 100 101 101 107 94 | 95 95 94 95 94 95 95 94 96 |
| Pyridine-d5 | 105 104 102 102 102 101 100 100 100 100 | 97 98 97 96 96 96 94 95 95 |
| Chlorobenzene-d5 | 107 105 101 102 103 103 100 101 101 102 102 103 103 100 101 101 102 102 |
| Naphthalene-d8 | 106 104 101 101 101 102 100 100 98 97 | 96 97 96 96 97 96 95 94 93 |
| Acenaphthene-d10 | 107 105 102 102 103 102 100 101 101 100 99 | 98 98 98 98 97 98 98 96 95 |

| Coefficient of Variation (CV) (%)|
|--------------------------------|
| Acetoin | N/A 265 125 69 | 6 7 6 4 3 2 | N/A 265 126 70 | 14 6 5 4 4 |
| Compound            | 1st  | 2nd  | 3rd  | 4th  | 5th  | 6th  | 7th  | Mean  |
|---------------------|------|------|------|------|------|------|------|-------|
| Butanoic Acid       | 171  | 171  | 46   |      |      |      |      | 171   |
| Benzaldehyde        | 6    | 8    | 5    | 3    | 3    | 4    | 3    | 3     |
| 2,3,5-Trimethylpyrazine | 3   | 6    | 2    | 4    | 3    | 2    | 1    | 2     |
| DL-Limonene         | 95   | 46   | 9    | 10   | 6    | 3    | 2    | 4     |
| Eucalyptol          | 44   | 13   | 8    | 9    | 7    | 4    | 3    | 4     |
| Benzylic Alcohol    | 8    | 6    | 4    | 6    | 3    | 3    | 1    | 3     |
| Furaneol            | 5    | 7    | 8    | 3    | 4    | 4    | 2    | 4     |
| Maltol              | 125  | 94   | 44   |      |      |      |      | 125   |
| L-Menthol           | 68   | 45   | 7    | 6    | 6    | 4    | 3    | 3     |
| Methyl Salicylate   | 46   | 44   | 6    | 3    | 3    | 4    | 2    | 2     |
| Ethyl Maltol        | 125  | 69   | 5    | 5    | 4    | 5    | 2    | 2     |
| (+)Pulegone         | 7    | 9    | 7    | 5    | 3    | 3    | 3    | 2     |
| Ethyl Salicylate    | 7    | 5    | 7    | 3    | 2    | 3    | 2    | 2     |
| trans-Cinnamaldehyde| 10   | 8    | 4    | 3    | 4    | 1    | 2    | 6     |
| Triacetin           | 6    | 8    | 4    | 6    | 4    | 4    | 2    | 2     |
| Eugenol             | 4    | 6    | 6    | 1    | 4    | 2    | 4    | 2     |
| Vanillin            | 70   | 68   | 69   | 44   | 2    | 4    | 6    | 3     |
| Ethyl Vanillin      | 45   | 10   | 5    | 8    | 3    | 4    | 3    | 2     |
| Isovanillin         | 45   | 8    | 7    | 5    | 4    | 3    | 3    | 2     |
| Benzenedi6          | 4    | 6    | 4    | 3    | 4    | 0    | 2    | 2     |
| Pyridined5          | 5    | 6    | 4    | 5    | 3    | 3    | 0    | 2     |
| Chlorobenzened5     | 6    | 8    | 4    | 3    | 2    | 1    | 0    | 3     |
| Naphthalened8       | 4    | 5    | 2    | 2    | 3    | 3    | 0    | 2     |
| Acenaphthened10      | 7    | 7    | 3    | 3    | 3    | 3    | 0    | 3     |

1Averaged from 7 independent batches analyzed across 7 days
Italicized and grey indicates values outside of the instrument linear range where recovery is estimated. Bold indicates values outside of 80-120% percent recovery or ±20% CV.
### Supplemental Table 5 – Method Validation Parameters for Mid-Range and Low-Range Fortified Matrix Samples Across 7 Batches

| Method Validation Measure¹ | Mid-Range Fortified Matrix Samples | LLOQ Fortified Matrix Samples |
|-----------------------------|-----------------------------------|------------------------------|
|                             | Expected Concentration (mg/mL)    |                              |
|                             | 0.04 | 0.10 | 0.88 | 1.75 | 3.5 | 7.0 | 0.01 | 0.04 | 0.07 | 0.10 | 0.27 |
| **Acetoin**                 |      |      |      |      |     |     |      |      |      |      |      |
| **Within Batch Precision (%)** |      |      |      |      |     |     |      |      |      |      |      |
| Batch #                     |      |      |      |      |     |     |      |      |      |      |      |
| 1                          | 8    | 19   | 4    | 7    | 4   | 2   | ---  | 21   | 29   | 7    | 5    |
| 2                          | 27   | 4    | 9    | 6    | 3   | 1   | ---  | 33   | 3    | 20   | 11   |
| 3                          | 9    | 8    | 3    | 4    | 3   | 4   | ---  | 8    | 4    | 9    | 10   |
| 4                          | 6    | 38   | 4    | 6    | 1   | 3   | ---  | 41   | 50   | 19   | 14   |
| 5                          | ---  | 5    | 6    | 2    | 6   | 7   | ---  | ---  | ---  | ---  | 20   |
| 6                          | ---  | 92   | 5    | 6    | 2   | 5   | ---  | 5    | ---  | ---  | 9    |
| 7                          | ---  | ---  | 7    | 4    | 9   | 2   | ---  | ---  | 5    | 29   | 4    |
| **Between Batch Precision (%)** | 68   | 33   | 6    | 6    | 6   | 5   | ---  | 50   | 53   | 29   | 12   |
| **Between Batch Bias (%)**  | 37   | 17   | 2    | 1    | 1   | 1   | ---  | 48   | 0    | 9    | 5    |
| **Butanoic Acid**           |      |      |      |      |     |     |      |      |      |      |      |
| **Within Batch Precision (%)** |      |      |      |      |     |     |      |      |      |      |      |
| Batch #                     |      |      |      |      |     |     |      |      |      |      |      |
| 1                          | 8    | 7    | 5    | 5    | 3   | 1   | 19   | 5    | 6    | 9    | 3    |
| 2                          | 7    | 10   | 2    | 2    | 3   | 2   | 2    | 5    | 5    | 11   | 2    |
| 3                          | 10   | 5    | 0    | 2    | 3   | 2   | 7    | 14   | 7    | 8    | 6    |
| 4                          | 4    | 6    | 0    | 1    | 1   | 4   | 7    | 6    | 5    | 5    | 2    |
| 5                          | 6    | 3    | 1    | 2    | 2   | 2   | 20   | 8    | 0    | 2    | 5    |
| 6                          | 17   | 10   | 4    | 3    | 3   | 1   | 51   | 19   | 14   | 10   | 7    |
| 7                          | 11   | 7    | 3    | 3    | 3   | 3   | ---  | 29   | 9    | 3    | 7    |
| **Between Batch Precision (%)** | 32   | 14   | 4    | 3    | 3   | 5   | 43   | 30   | 17   | 14   | 8    |
| **Between Batch Bias (%)**  | 39   | -2   | -8   | -2   | 4   | 1   | 252  | 36   | 4    | -4   | -13  |
| **Benzaldehyde**            |      |      |      |      |     |     |      |      |      |      |      |
| **Within Batch Precision (%)** |      |      |      |      |     |     |      |      |      |      |      |
| Batch #                     |      |      |      |      |     |     |      |      |      |      |      |
| 1                          | 11   | 2    | 5    | 2    | 4   | 5   | 18   | 7    | 4    | 4    | 0    |
| 2                          | 6    | 4    | 1    | 3    | 2   | 4   | 15   | 3    | 4    | 1    | 5    |
| 3                          | 2    | 3    | 1    | 2    | 3   | 4   | 10   | 4    | 6    | 4    | 4    |
| 4                          | 4    | 7    | 3    | 5    | 1   | 1   | 18   | 2    | 3    | 5    | 6    |
| 5                          | 11   | 6    | 1    | 1    | 2   | 3   | 21   | 6    | 7    | 13   | 2    |
| 6                          | 13   | 4    | 2    | 1    | 3   | 1   | 28   | 1    | 8    | 4    | 5    |
| 7                          | 8    | 2    | 1    | 2    | 4   | 0   | 4    | 9    | 4    | 3    | 5    |
| **Between Batch Precision (%)** | 8    | 6    | 4    | 5    | 4   | 4   | 30   | 12   | 8    | 7    | 6    |
| Between Batch Bias (%) | -5 | -10 | -5 | -1 | 0 | -2 | -5 | -5 | -6 | -5 | -5 |
|------------------------|----|-----|----|----|---|----|----|----|----|----|----|
| **2,3,5-Trimethylpyrazine** |    |     |    |    |   |     |    |    |    |    |    |
| **Within Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Batch #** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Between Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Between Batch Bias (%)** |    |     |    |    |   |     |    |    |    |    |    |

| Between Batch Precision (%) | -5 | -10 | -5 | -1 | 0 | -2 | -5 | -5 | -6 | -5 | -5 |
|-----------------------------|----|-----|----|----|---|----|----|----|----|----|----|
| **DL-Limonene** |    |     |    |    |   |     |    |    |    |    |    |
| **Within Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Batch #** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Between Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Between Batch Bias (%)** |    |     |    |    |   |     |    |    |    |    |    |

| Between Batch Precision (%) | -5 | -10 | -5 | -1 | 0 | -2 | -5 | -5 | -6 | -5 | -5 |
|-----------------------------|----|-----|----|----|---|----|----|----|----|----|----|
| **Eucalyptol** |    |     |    |    |   |     |    |    |    |    |    |
| **Within Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Batch #** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Between Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Between Batch Bias (%)** |    |     |    |    |   |     |    |    |    |    |    |

| Between Batch Precision (%) | -5 | -10 | -5 | -1 | 0 | -2 | -5 | -5 | -6 | -5 | -5 |
|-----------------------------|----|-----|----|----|---|----|----|----|----|----|----|
| **Benzyl Alcohol** |    |     |    |    |   |     |    |    |    |    |    |
| **Within Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Batch #** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| **Between Batch Precision (%)** |    |     |    |    |   |     |    |    |    |    |    |
| **Between Batch Bias (%)** |    |     |    |    |   |     |    |    |    |    |    |
| Batch # | Furaneol | Between Batch Precision (%) | Between Batch Bias (%) |
|---------|----------|----------------------------|-----------------------|
| 1       | 4        | 13                         | -1                    |
| 2       | 4        | 11                         | -7                    |
| 3       | 4        | 11                         | 2                     |
| 4       | 1        | 7                          | 8                     |
| 5       | 2        | 6                          | -2                    |
| 6       | 1        | 2                          | 12                    |
| 7       | 1        | 1                          | 2                     |

| Batch # | Maltol | Between Batch Precision (%) | Between Batch Bias (%) |
|---------|--------|----------------------------|-----------------------|
| 1       | 5      | 13                         | 6                     |
| 2       | 5      | 11                         | -3                    |
| 3       | 5      | 10                         | 3                     |
| 4       | 4      | 10                         | 4                     |
| 5       | 1      | 9                          | 2                     |
| 6       | 4      | 8                          | 3                     |
| 7       | 9      | 7                          | -4                    |

| Batch # | L-Menthol | Between Batch Precision (%) | Between Batch Bias (%) |
|---------|-----------|----------------------------|-----------------------|
| 1       | 27        | 18                         | 8                     |
| 2       | 13        | 12                         | -2                   |
| 3       | 14       | 17                         | -                      |
| 4       | 6        | 11                         | 10                   |
| 5       | 4        | 7                          | 6                     |
| 6       | 10       | 4                          | 18                   |
| 7       | 17       | 6                          | -29                   |

**Furaneol**

**Within Batch Precision (%)**

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------|---|---|---|---|---|---|---|---|---|
| 1       | 11| 8 | 4 | 3 | 4 | 5 | 22| 15| 10|
| 2       | 11| 4 | 4 | 4 | 7 | 3 | 7 | 7 | 3 |
| 3       | 9 | 5 | 2 | 4 | 7 | 24| 7 | 9 | 4 |
| 4       | 14| 1 | 3 | 4 | 6 | 24| 18| 13| 5 |
| 5       | 10| 9 | 6 | 6 | 10| 2 | 7 | 9 | 4 |
| 6       | 19| 5 | 5 | 2 | 4 | 6 | 10| 14| 9 |
| 7       | 4 | 3 | 4 | 4 | 13| 7 | 10| 8 | 4 |

**Maltol**

**Within Batch Precision (%)**

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------|---|---|---|---|---|---|---|---|---|
| 1       | 5 | 5 | 0 | 0 | 4 | 3 | 1 | 1 | 4 |
| 2       | 3 | 5 | 5 | 3 | 4 | 2 | 8 | 2 | 3 |
| 3       | 4 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 |
| 4       | 9 | 4 | 1 | 2 | 1 | 0 | 5 | 5 | 5 |
| 5       | 5 | 1 | 3 | 1 | 2 | 1 | 4 | 4 | 7 |
| 6       | 7 | 4 | 2 | 2 | 2 | 2 | 12| 8 | 6 |
| 7       | 9 | 8 | 3 | 4 | 3 | 2 | 9 | 2 | 3 |

**L-Menthol**

**Within Batch Precision (%)**

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------|---|---|---|---|---|---|---|
| 1       | 27| 16| 5 | 2 | 3 | 4 | 65|
| 2       | 13| 9 | 1 | 1 | 4 | 3 | 39|
| 3       | 14| 10| 2 | 3 | 1 | 3 | 34|
| 4       | 6 | 13| 6 | 4 | 1 | 1 | 53|
| 5       | 4 | 9 | 1 | 4 | 3 | 2 | 96|
| 6       | 10| 8 | 2 | 2 | 2 | 1 | 88|
| 7       | 17| 14| 4 | 4 | 2 | 3 | 20|

**Between Batch Precision (%)**

| Furaneol | Between Batch Precision (%) |
|----------|----------------------------|
| 13       | 11                         |
| 7        | 5                          |
| 4        | 4                          |
| 9        | 11                         |

**Between Batch Bias (%)**

| Furaneol | Between Batch Bias (%) |
|----------|------------------------|
| -1       | -7                     |
| 2        | 8                      |
| 8        | -2                    |
| 12       | 1                     |
| 2        | 0                     |

**Maltol**

**Between Batch Precision (%)**

| 37       | 16                         |
| 4        | 3                          |

**Between Batch Bias (%)**

| 42       | -2                         |
| -3       | 5                          |
| 9        | 3                          |

**L-Menthol**

**Between Batch Precision (%)**

| 18       | 12                         |
| 4        | 3                          |
| 4        | 4                          |

**Between Batch Bias (%)**

| 8        | 0                          |
| -2       | 0                          |
| -29      | 6                          |
| 0        | -5                         |
| -8       | -8                         |
| Methyl Salicylate |                     |                     |                     |                    |
|-------------------|---------------------|---------------------|---------------------|--------------------|
| **Within Batch Precision (%)** | **Batch #** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** | **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** |
| **Between Batch Precision (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Between Batch Bias (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |

| Ethyl Maltol |                     |                     |                     |                    |
|--------------|---------------------|---------------------|---------------------|--------------------|
| **Within Batch Precision (%)** | **Batch #** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** | **46** |
| **Between Batch Precision (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Between Batch Bias (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |

| (+)Pulegone |                     |                     |                     |                    |
|-------------|---------------------|---------------------|---------------------|--------------------|
| **Within Batch Precision (%)** | **Batch #** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** | **45** | **46** |
| **Between Batch Precision (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Between Batch Bias (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |

| Ethyl Salicylate |                     |                     |                     |                    |
|------------------|---------------------|---------------------|---------------------|--------------------|
| **Within Batch Precision (%)** | **Batch #** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** | **16** | **17** | **18** | **19** | **20** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** | **41** | **42** | **43** | **44** |
| **Between Batch Precision (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| **Between Batch Bias (%)** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
|      | 5 | 7 | 4 | 2 | 0 | 3 | 1 | 13 | 5 | 2 | 6 | 4 |
|------|---|---|---|---|---|---|---|----|---|---|---|---|
| 6    | 10| 3 | 1 | 3 | 3 | 2 | 6 | 3  | 10| 4 | 3 |
| 7    | 13| 4 | 2 | 2 | 1 | 1 | 10| 4  | 4 | 4 |

**Between Batch Precision (%)**

| Between Batch Bias (%) | 7 | 5 | 2 | 2 | 2 | 3 | 18 | 8 | 6 | 5 | 4 |
|-------------------------|---|---|---|---|---|---|----|---|---|---|---|
|                        | -2| -6| 0 | 4 | 8 | 1 | 8  | -9| -10| -11| -10|

**trans-Cinnamaldehyde**

|      | 1 | 4 | 4 | 4 | 4 | 4 | 1 | 28 | 16 | 2 | 4 | 6 |
|------|---|---|---|---|---|---|---|----|---|---|---|---|
| 2    | 3 | 7 | 2 | 5 | 5 | ---| 23| 10 | 2 | 7 | 4 |
| 3    | 1 | 4 | 4 | 2 | 5 | 13 | 18| 13 | 4 | 4 | 3 |
| 4    | 9 | 5 | 2 | 1 | 8 | 13 | 8  | 11 | 3 | 4 |
| 5    | 5 | 5 | 2 | 2 | 11| ---| 7 | 2  | 5 | 8 | 5 |
| 6    | 9 | 8 | 6 | 7 | ---| 6  | 11 | 3  | 5 | 3 |
| 7    | 9 | 4 | 2 | 2 | 11| ---| 29| 9  | 4 | 9 | 4 |

**Within Batch Precision (%)**

|      | -9| -18| -18| -19| -11| -21| -13| -12| -10| -12| -10|
|------|---|----|----|----|----|----|----|----|----|----|----|

**Triacetin**

|      | 1 | 4 | 3 | 1 | 3 | 2 | 2 | 28 | 16 | 2 | 4 | 6 |
|------|---|---|---|---|---|---|---|----|---|---|---|---|
| 2    | 3 | 4 | 4 | 1 | 2 | 1 | 40 | 4  | 3 | 5 | 5 |
| 3    | 8 | 6 | 3 | 3 | 2 | 2 | 33 | 11 | 5 | 3 | 3 |
| 4    | 16| 8 | 5 | 4 | 1 | 3 | 36 | 9  | 7 | 9 | 0 |
| 5    | 12| 12| 4 | 3 | 3 | 1 | 16 | 22 | 8 | 5 | 4 |
| 6    | 20| 8 | 6 | 1 | 3 | 1 | 40 | 12 | 7 | 9 | 9 |
| 7    | 4 | 4 | 5 | 3 | 3 | 1 | 45 | 4  | 12| 4 | 8 |

**Between Batch Precision (%)**

| Between Batch Bias (%) | 16| 7 | 4 | 3 | 3 | 3 | 41 | 19 | 11| 8 | 8 |
|-------------------------|---|---|---|---|---|---|----|---|---|---|---|
|                        | -6| -7| -4| -1| 1 | -2| -7 | -8 | -11| -8 | -13|

**Eugenol**

|      | 1 | 0 | 4 | 4 | 3 | 2 | 3 | 7  | 8 | 2 | 8 | 2 |
|------|---|---|---|---|---|---|---|----|---|---|---|---|
| 2    | 1 | 6 | 1 | 2 | 1 | 3 | 3  | 7  | 3 | 4 | 3 |
| 3    | 3 | 4 | 1 | 3 | 2 | 3 | 4  | 4  | 3 | 4 | 2 |
| 4    | 4 | 5 | 2 | 3 | 3 | 2 | 13 | 4  | 7 | 8 | 7 |
| 5    | 10| 5 | 1 | 2 | 5 | 1 | 11 | 7  | 10| 5 | 4 |
| 6    | 5 | 4 | 3 | 1 | 2 | 5 | 5  | 8  | 6 | 4 | 4 |
| 7    | 7 | 2 | 2 | 1 | 3 | 3 | 13 | 13 | 8 | 3 | 0 |

**Vanillin**

|      | 11| 5 | 3 | 3 | 3 | 3 | 30| 14 | 8 | 6 | 4 |
|------|---|---|---|---|---|---|----|---|---|---|---|
| 2    | -1| -10| -1| 5 | 9 | 0 | 13 | -15| -20| -21| -22|
### Within Batch Precision (%)

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------|---|---|---|---|---|---|---|
| 1       | 4 | 2 | 1 | 1 | 4 | 3 | 4 |
| 2       | 10| 9 | 1 | 2 | 1 | 2 | 5 |
| 3       | 4 | 4 | 3 | 3 | 1 | 3 | 4 |
| 4       | 5 | 3 | 3 | 3 | 1 | 1 | 4 |
| 5       | 18| 3 | 4 | 3 | 3 | 1 | 2 |
| 6       | 11| 2 | 1 | 2 | 3 | 1 | 1 |
| 7       | 16| 3 | 3 | 1 | 4 | 2 | 10|

| Between Batch Precision (%) | 35 | 13 | 6 | 7 | 5 | 6 | 86 |
|------------------------------|----|----|---|---|---|---|----|
| Between Batch Bias (%)       | 31 | -3 | -5 | 1 | 7 | 2 | 97 |

### Ethyl Vanillin

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------|---|---|---|---|---|---|---|
| 1       | 2 | 7 | 1 | 3 | 2 | 3 | 21|
| 2       | 16| 7 | 2 | 4 | 0 | 2 | 8 |
| 3       | 9 | 4 | 2 | 3 | 1 | 1 | 35|
| 4       | 4 | 6 | 5 | 2 | 2 | 1 | 13|
| 5       | 16| 7 | 4 | 2 | 4 | 1 | 75|
| 6       | 9 | 2 | 2 | 2 | 2 | 2 | 20|
| 7       | 13| 4 | 2 | 3 | 3 | 2 | 9 |

| Between Batch Precision (%) | 13 | 6 | 3 | 3 | 4 | 47 | 15 |
|------------------------------|----|---|---|---|---|----|----|
| Between Batch Bias (%)       | 5  | -6| 1 | 5 | 9 | 2  | 9 |

### Isovanillin

| Batch # | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------|---|---|---|---|---|---|---|
| 1       | 14| 2 | 3 | 3 | 2 | 4 | 5 |
| 2       | 1 | 1 | 1 | 5 | 6 | 4 | 10|
| 3       | 2 | 7 | 4 | 5 | 7 | 2 | 57|
| 4       | 11| 8 | 5 | 6 | 5 | 6 | 39|
| 5       | 9 | 8 | 1 | 5 | 2 | 6 | 14|
| 6       | 3 | 1 | 4 | 2 | 5 | 6 | 27|
| 7       | 11| 3 | 6 | 1 | 6 | 3 | 23|

| Between Batch Precision (%) | 12 | 5 | 4 | 5 | 5 | 49 | 10 |
|------------------------------|----|---|---|---|---|----|----|
| Between Batch Bias (%)       | 1  | -7| 1 | 5 | 8 | 11| -6|

1Averaged from 7 independent batches analyzed across 7 days

Italicized and grey indicates values outside of the instrument linear range where recovery is estimated. Bold indicates values outside of 80-120% percent recovery or ±20% CV.
Supplemental Table 6 – Carryover Assessment with 50:50 PG:VG and Methanol Matrix Blanks

|                  | Matrix blank assessed | 50:50 PG:VG | 50:50 PG:VG | Methanol | Methanol |
|------------------|-----------------------|-------------|-------------|----------|----------|
| **Standard concentration injected prior to matrix blank** |                       | 8mg/mL      | 10mg/mL     |          |          |
| **Acetoin**      | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Butanoic Acid**| **0.04**              | **0.04**    | 0.00        | 0.00     | 0.00     |
| **Benzaldehyde** | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **2,3,5-Trimethylpyrazine** | 0.00        | 0.00        | 0.00        | 0.00     | 0.00     |
| **DL-Limonene**  | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Eucalyptol**   | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Benzy1 Alcohol** | 0.00            | 0.00        | 0.00        | 0.00     | 0.00     |
| **Furaneol**     | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Maltol**       | **0.04**              | **0.04**    | **0.03**    | **0.03** |          |
| **L-Menthol**    | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Methyl Salicylate** | 0.00        | 0.00        | 0.00        | 0.00     | 0.00     |
| **Ethyl Maltol** | **0.03**              | **0.03**    | **0.02**    | **0.01** |          |
| **(+)-Pulegone** | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Ethyl Salicylate** | 0.00            | 0.00        | 0.00        | 0.00     | 0.00     |
| **trans-Cinnamaldehyde** | 0.00        | 0.00        | **0.01**    | **0.01** |          |
| **Triacetin**    | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Eugenol**      | 0.00                  | 0.00        | 0.00        | 0.00     | 0.00     |
| **Vanillin**     | **0.05**              | **0.04**    | **0.02**    | **0.01** |          |
| **Ethyl Vanillin** | **0.01**            | **0.00**    | **0.00**    | **0.00** |          |
| **Isovanillin**  | 0.00                  | **0.01**    | **0.02**    | **0.01** |          |

Average Carryover (mg/mL)
### Supplemental Table 7 – Dilution Precision and Bias Determined from Four Dilution Factors

| Dilution Factor | Fortified Matrix Sample Concentration (mg/mL) | Concentration after dilution (mg/mL) | Between Run Precision (CV%) | Between Run Bias (CV%) |
|-----------------|---------------------------------------------|-------------------------------------|-----------------------------|------------------------|
|                 | 2X                                          | 5X                                  | 10X                         | 50X                    |
| 2X              | 5   | 10 | 18.6 | 5   | 10 | 18.6 | 10  | 18.6 | 10  | 18.6 |
| 5X              | 2.5 | 5  | 9.3  | 1   | 2  | 3.72 | 1   | 1.86 | 0.2 | 0.372|
| **Between Run Precision (CV%)** | | | | | | | | | | |
| Acetoin         | 7   | 7  | 2    | 7   | 9  | 6    | 11  | 6   | 17  | 17  |
| Butanoic Acid   | 14  | 16 | 19   | 15  | 13 | 4    | 20  | 5   | 16  | 14  |
| Benzaldehyde    | 3   | 2  | 6    | 3   | 5  | 6    | 9   | 5   | 8   | 11  |
| 2,3,5-Trimethylpyrazine | 5   | 6  | 10   | 7   | 6  | 5    | 7   | 4   | 9   | 16  |
| DL-Limonene     | 10  | 7  | 16   | 13  | 13 | 14   | 19  | 8   | 11  | 7   |
| Eucalyptol      | 4   | 3  | 10   | 4   | 5  | 4    | 9   | 7   | 8   |      |
| Benzyl Alcohol  | 10  | 4  | 14   | 26  | 18 | 7    | 23  | 21  | 41  | 46  |
| Furaneol        | 11  | 17 |      | 11  | 19 | 27   | 18  | 17  | 10  | 23  |
| Maltol          | 4   | 6  | 5    | 3   | 6  | 3    | 6   | 6   | 9   | 10  |
| L-Menthol       | 3   | 5  | 10   | 4   | 5  | 4    | 6   | 6   | 5   | 14  |
| Methyl Salicylate| 4   | 3  | 9    | 6   | 4  | 4    | 7   | 6   | 6   | 16  |
| Ethyl Maltol    | 4   | 4  | 3    | 5   | 6  | 5    | 7   | 7   | 12  | 13  |
| (+)Pulegone     | 5   | 2  | 9    | 6   | 6  | 4    | 5   | 5   | 8   | 17  |
| Ethyl Salicylate| 3   | 5  | 10   | 3   | 3  | 5    | 6   | 5   | 6   | 13  |
| trans-Cinnamaldehyde | 4   | 12 | ---  | 9   | 15 | 13   | 19  | 17  | 15  | 23  |
| Triacetin       | 4   | 4  | 8    | 7   | 6  | 5    | 7   | 6   | 13  | 20  |
| Eugenol         | 4   | 4  | 7    | 5   | 5  | 4    | 6   | 3   | 8   | 17  |
| Vanillin        | 9   | 7  | 9    | 7   | 7  | 8    | 8   | 9   | 16  | 19  |
| Ethyl Vanillin  | 5   | 6  | 3    | 8   | 4  | 6    | 5   | 7   | 14  | 17  |
| Isovanillin     | 5   | 2  | 19   | 5   | 4  | 13   | 9   | 5   | 11  | 23  |
| **Between Run Bias (CV%)** | | | | | | | | | | |
| Acetoin         | 9   | 6  | -2   | 7   | 1  | -7   | 17  | -10 | 19  | -14 |
| Butanoic Acid   | -11 | -5 | -14  | -17 | -14| -3   | -14 | -4  | -14 | -33 |
| Benzaldehyde    | 16  | 16 | 0    | 14  | 16 | 7    | 25  | 6   | 16  | -10 |
| 2,3,5-Trimethylpyrazine | 14  | 8  | -5   | 10  | 10 | 3    | 21  | 5   | 13  | -15 |
| DL-Limonene     | **26** | **28** | -9 | 11  | **42** | 8   | **41** | 1   | **45** | 4   |
| Eucalyptol      | 5   | 7  | -9   | 3   | 5  | -9   | 14  | -10 | 8   | -23 |
| Benzyl Alcohol  | **24** | 10 | -12  | **33** | 25 | 6    | **47** | 20  | **54** | 19  |
| Furaneol        | -11 | -**21** | -**37** | -18 | -26 | -42  | -14 | -**38** | -11 | -**39** |
| Compound          | 11 | 13 | -3 | 0 | 9 | 5 | 14 | 1 | -2 | -26 |
|-------------------|----|----|----|---|---|---|----|---|----|-----|
| Maltol            | 11 | 13 | -3 | 0 | 9 | 5 | 14 | 1 | -2 | -26 |
| L-Menthol         | 5  | 9  | -4 | 5 | 7 | -4 | 22 | 1 | 29 | -6  |
| Methyl Salicylate | 13 | 12 | -10 | 8 | 17 | 3 | 24 | 5 | 15 | -13 |
| Ethyl Maltol      | 13 | 13 | -6 | 2 | 11 | 0 | 13 | -4 | -3 | -28 |
| (+)-Pulegone      | 9  | 7  | -9 | 6 | 6 | -5 | 17 | -2 | 18 | -11 |
| Ethyl Salicylate  | 20 | 14 | -9 | 16 | 21 | 6 | 31 | 10 | 20 | -9  |
| trans-Cinnamaldehyde | 15 | 9  | -8 | 7 | -4 | -13 | 7 | -14 | 19 | -17 |
| Triacetin         | 6  | 5  | -8 | 4 | 6 | -7 | 15 | -5 | 16 | -15 |
| Eugenol           | 15 | 10 | -8 | 9 | 12 | 1 | 19 | 3  | 12 | -14 |
| Vanillin          | -1 | -8 | 7  | -5 | -13 | 1 | -7 | 2  | -8 | -15 |
| Ethyl Vanillin    | 6  | -5 | 11 | 1 | -7 | 8 | 2  | 9  | -1 | -6  |
| Isovanillin       | -2 | -18 | 53 | -4 | -26 | 20 | -21 | 17 | -19 | 1   |

Italicized and grey indicates values outside of the instrument linear range where recovery is estimated. Bold indicates values outside of ±20% CV.
Supplemental Table 8 – Descriptive Summary of Twenty Flavoring Chemicals Detected in 215 Commercial E-Cigarette Liquids with Various Flavors

| Flavor Category | Predominately Found | % Found in most Predominate Flavor Category |
|-----------------|---------------------|-------------------------------------------|
| L-Menthol       | Menthol/Mint        | 48                                        |
| Ethyl Maltol    | Fruit (tropical),  Dessert | 24, 19                                    |
| Vanillin        | Dessert             | 35                                        |
| Triacetin       | Fruit (tropical),  Fruit (berries) | 27, 16                                    |
| Ethyl Vanillin  | Dessert             | 36                                        |
| Butanoic Acid   | Fruit (berries)     | 44                                        |
| Methyl Salicylate | Menthol/Mint,  Fruit (tropical),  Tobacco | 33 each                                 |
| Acetoin         | Dessert             | 50                                        |
| Maltol          | Fruit (berries), Fruit (other) | 30, 26                                    |
| Benzyl Alcohol  | Fruit (tropical),  Fruit (berries) | 26, 22                                    |
| Furaneol        | Candy, Dessert,  Fruit (berries) | 22, 20, 19                                |
| Benzaldehyde    | Candy, Other Beverages | 35, 25                                    |
| DL-Limonene     | Menthol/Mint        | 33                                        |
| Eugenol         | Fruit (tropical)    | 100                                       |
| Eucalyptol      | Menthol/Mint        | 100                                       |
| (+)Pulegone      | Menthol/Mint        | 83                                        |
| 2,3,5-Trimethylpyrazine | Tobacco | 62                                        |
| Ethyl Salicylate | ---                 | ---                                       |
| trans-Cinnamaldehyde | ---                 | ---                                       |
| Isovanillin     | ---                 | ---                                       |
Supplemental Figure 1 – Calibration Curves for Twenty Flavoring Chemicals

(A) Acetoin

(B) Butanoic Acid

(C) Benzaldehyde

(D) 2,3,5-Trimethylpyrazine

(E) DL-Limonene

(F) Eucalyptol

(G) Benzyl Alcohol

(H) Furan-2-ol
(I) Maltol

Maltol - 5 Levels, 5 Levels Used, 5 Points, 5 Points Used, 4 QCs

$y = 0.06496 \times x^2 + 0.720615 \times x - 0.095732$

$R^2 = 0.99909397$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(J) L-Menthol

L-Menthol - 8 Levels, 8 Levels Used, 8 Points, 8 Points Used, 7 QCs

$y = -0.001589 \times x^2 + 0.091434 \times x - 0.01726$

$R^2 = 0.99610914$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(K) Methyl Salicylate

Methyl Salicylate - 8 Levels, 8 Levels Used, 8 Points, 8 Points Used, 7 QCs

$y = 0.003196 \times x^2 + 0.397547 \times x - 0.006466$

$R^2 = 0.99744189$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(L) Ethyl Maltol

Ethyl Maltol - 5 Levels, 5 Levels Used, 5 Points, 5 Points Used, 4 QCs

$y = 1.578438E-004 \times x^2 + 0.336239 \times x - 0.033232$

$R^2 = 0.99675926$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(M) (+)Pulegone

(+)-Pulegone - 10 Levels, 10 Levels Used, 10 Points, 10 Points Used, 9 QCs

$y = 0.006511 \times x^2 + 0.196289 \times x - 2.641118E-004$

$R^2 = 0.99816798$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(N) Ethyl Salicylate

Ethyl Salicylate - 10 Levels, 10 Levels Used, 10 Points, 10 Points Used, 9 QCs

$y = 0.969839E-004 \times x^2 + 0.383340 \times x - 0.8391439E-004$

$R^2 = 0.99640183$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(O) trans-Cinnamaldehyde

trans-Cinnamaldehyde - 6 Levels, 6 Levels Used, 6 Points, 6 Points Used, 5 QCs

$y = -0.06282 \times x^2 + 0.393074 \times x + 0.006493$

$R^2 = 0.99839879$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2

(P) Triacetin

Triacetin - 9 Levels, 9 Levels Used, 9 Points, 9 Points Used, 8 QCs

$y = 0.002161 \times x^2 + 0.165733 \times x + 0.001615$

$R^2 = 0.99640183$

Type: Quadratic, Origin: Ignore, Weight: 1/x^2
Circles (black) indicate calibration standards within the working calibration range (Supplemental Table 3) and are included in the calculation of the curve and corresponding $r^2$ value.

Triangles (blue) indicate quality control standards within the working calibration range.