

APPENDIX- E: 2012

Data Summary for All Chemicals of Potential Concern
(COPCs)

Table E1. 2012 Chemicals with Toxicity Values at the Bell and Battlement Mesa Sites in the Rural Oil & Gas Development Area.

| Compound | BELL | | | BATLEMENT MESA | | |
|--------------------------------------|--------------|-------------------------------------|------------------------------|----------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Acetaldehyde | 0.00% | 1.629 | 0.712 | 0.00% | 1.414 | 0.643 |
| Acetone | 0.00% | 4.276 | 2.596 | 0.00% | 9.145 | 3.900 |
| Benzene | 1.72% | 1.502 | 0.743 | 0.00% | 2.364 | 1.187 |
| 1,3-Butadiene | 60.34% | 0.267 | 0.126 | 47.17% | 0.448 | 0.130 |
| Crotonaldehyde | 10.71% | 0.527 | 0.236 | 22.22% | 0.376 | 0.085 |
| Cyclohexane | 0.00% | 5.657 | 2.031 | 0.00% | 4.400 | 1.973 |
| Ethylbenzene | 22.41% | 0.388 | 0.099 | 0.00% | 0.409 | 0.210 |
| Formaldehyde | 0.00% | 3.107 | 1.195 | 0.00% | 1.805 | 1.031 |
| n-Hexane | 0.00% | 11.570 | 3.805 | 0.00% | 6.873 | 3.213 |
| Isopropylbenzene | 81.03% | 0.108 | 0.069 | 81.13% | 0.100 | 0.076 |
| Methylcyclohexane | 0.00% | 9.236 | 3.594 | 3.77% | 8.605 | 3.969 |
| Nonane | 0.00% | 0.688 | 0.280 | 0.00% | 0.973 | 0.475 |
| Pentane | 0.00% | 20.480 | 7.096 | 0.00% | 30.570 | 8.128 |
| Propionaldehyde | 3.57% | 0.173 | 0.084 | 11.11% | 0.154 | 0.080 |
| Propylene | 0.00% | 1.624 | 0.427 | 0.00% | 1.446 | 0.492 |
| Propylbenzene | 56.90% | 0.323 | 0.097 | 39.62% | 0.291 | 0.120 |
| Styrene | 62.07% | 10.920 | 1.332 | 66.04% | 13.150 | 2.408 |
| Toluene | 0.00% | 3.930 | 1.582 | 0.00% | 19.600 | 5.207 |
| 1,2,3-Trimethylbenzene | 77.59% | 0.170 | 0.065 | 50.94% | 0.276 | 0.101 |
| 1,2,4-Trimethylbenzene | 6.90% | 0.939 | 0.314 | 0.00% | 0.978 | 0.401 |
| 1,3,5-Trimethylbenzene | 53.45% | 0.345 | 0.097 | 13.21% | 0.302 | 0.171 |
| m-Xylene/p-Xylene | 0.00% | 1.574 | 0.566 | 0.00% | 1.878 | 1.153 |
| o-Xylene | 8.62% | 0.462 | 0.147 | 0.00% | 0.477 | 0.292 |
| Aliphatic hydrocarbons C5-C8 | NA | 77.308 | 27.007 | NA | 60.548 | 24.507 |
| Aliphatic hydrocarbons C9-C18 | NA | 4.699 | 1.344 | NA | 4.064 | 1.465 |
| Aromatic hydrocarbons C9-C16 | NA | 2.304 | 0.598 | NA | 2.347 | 0.948 |

NA = Not Applicable

Table E1.1. 2012 Chemicals with Toxicity Values at the Parachute and Rifle Sites in the Urban Oil & Gas Development Area

| Compound | PARACHUTE | | | RIFLE | | |
|--------------------------------------|--------------|-------------------------------------|------------------------------|--------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Acetaldehyde | 0.00% | 1.559 | 0.817 | 0.00% | 2.360 | 1.203 |
| Acetone | 0.00% | 4.062 | 2.643 | 0.00% | 5.345 | 2.984 |
| Benzene | 4.44% | 2.960 | 1.415 | 0.00% | 3.056 | 1.090 |
| 1,3-Butadiene | 28.89% | 0.281 | 0.113 | 6.67% | 0.570 | 0.211 |
| Crotonaldehyde | 14.81% | 0.330 | 0.089 | 10.71% | 0.407 | 0.135 |
| Cyclohexane | 0.00% | 6.597 | 2.736 | 0.00% | 5.909 | 1.860 |
| Ethylbenzene | 4.44% | 0.419 | 0.184 | 0.00% | 0.695 | 0.288 |
| Formaldehyde | 0.00% | 2.309 | 1.404 | 0.00% | 2.800 | 1.574 |
| n-Hexane | 0.00% | 10.050 | 4.154 | 0.00% | 11.160 | 3.442 |
| Isopropylbenzene | 73.33% | 0.139 | 0.079 | 63.33% | 0.116 | 0.081 |
| Methylcyclohexane | 0.00% | 13.250 | 5.664 | 0.00% | 10.330 | 3.073 |
| Nonane | 0.00% | 2.011 | 0.678 | 0.00% | 1.020 | 0.345 |
| Pentane | 0.00% | 17.410 | 6.266 | 0.00% | 20.600 | 6.786 |
| Propionaldehyde | 3.70% | 0.154 | 0.081 | 3.57% | 0.268 | 0.126 |
| Propylene | 0.00% | 3.769 | 1.078 | 0.00% | 2.547 | 1.100 |
| Propylbenzene | 46.67% | 0.413 | 0.128 | 25.00% | 0.546 | 0.151 |
| Styrene | 71.11% | 11.770 | 2.522 | 66.67% | 7.082 | 1.016 |
| Toluene | 0.00% | 15.990 | 5.254 | 0.00% | 6.137 | 2.402 |
| 1,2,3-Trimethylbenzene | 48.89% | 0.277 | 0.095 | 40.00% | 0.552 | 0.128 |
| 1,2,4-Trimethylbenzene | 0.00% | 1.360 | 0.439 | 0.00% | 2.125 | 0.567 |
| 1,3,5-Trimethylbenzene | 22.22% | 0.511 | 0.203 | 11.67% | 0.469 | 0.178 |
| m-Xylene/p-Xylene | 0.00% | 3.539 | 1.285 | 0.00% | 3.343 | 1.174 |
| o-Xylene | 0.00% | 0.624 | 0.292 | 0.00% | 0.890 | 0.399 |
| Aliphatic hydrocarbons C5-C8 | NA | 75.127 | 31.244 | NA | 85.466 | 27.398 |
| Aliphatic hydrocarbons C9-C18 | NA | 5.563 | 1.986 | NA | 8.857 | 1.782 |
| Aromatic hydrocarbons C9-C16 | NA | 5.692 | 1.150 | NA | 5.922 | 1.268 |

NA = Not Applicable

Table E 2. 2012 Total Petroleum Hydrocarbons with Toxicity Values at the Bell and Battlement Mesa Sites in the Rural Oil & Gas Development Area.

| Compound | BELL | | | BATTLEMENT MESA | | |
|--|--------------|------------------|---------------|-----------------|------------------|---------------|
| | % Samples ND | Max. Conc. µg/m³ | EPC µg/m³ | % Samples ND | Max. Conc. µg/m³ | EPC µg/m³ |
| Aliphatic hydrocarbons C5-C8 | | | | | | |
| 1-Heptene | 39.66% | 1.056 | 0.322 | 32.08% | 0.901 | 0.347 |
| 1-Hexene | 77.59% | 0.206 | 0.142 | 79.25% | 0.228 | 0.139 |
| 1-Octene | 44.83% | 0.529 | 0.145 | 41.51% | 0.252 | 0.144 |
| 1-Pentene | 32.76% | 0.348 | 0.151 | 11.32% | 0.665 | 0.248 |
| 2,2,3-Trimethylpentane | 87.93% | 0.149 | 0.106 | 56.60% | 0.236 | 0.125 |
| 2,2,4-Trimethylpentane | 89.66% | 0.299 | 0.077 | 71.70% | 0.361 | 0.107 |
| 2,2-Dimethylbutane | 1.72% | 0.916 | 0.346 | 3.77% | 0.770 | 0.384 |
| 2,3,4-Trimethylpentane | 63.79% | 0.231 | 0.083 | 26.42% | 0.182 | 0.092 |
| 2,3-Dimethylbutane | 20.69% | 1.674 | 0.544 | 20.75% | 1.422 | 0.558 |
| 2,3-Dimethylpentane | 1.72% | 0.767 | 0.320 | 0.00% | 0.621 | 0.346 |
| 2,4-Dimethylpentane | 5.17% | 0.591 | 0.238 | 3.77% | 0.467 | 0.256 |
| 2-Ethyl-1-butene | 100.00% | NA | NA | 100.00% | NA | NA |
| 2-Methyl-1-butene | 84.48% | 0.230 | 0.118 | 35.85% | 0.614 | 0.164 |
| 2-Methyl-1-pentene | 100.00% | NA | NA | 100.00% | NA | NA |
| 2-Methyl-2-butene | 77.59% | 0.386 | 0.109 | 26.42% | 0.797 | 0.216 |
| 2-Methylheptane | 5.17% | 0.759 | 0.343 | 1.89% | 0.864 | 0.460 |
| 2-Methylhexane | 0.00% | 2.225 | 0.965 | 0.00% | 2.318 | 1.121 |
| 2-Methylpentane | 0.00% | 9.869 | 3.382 | 0.00% | 6.227 | 3.062 |
| 3-Methyl-1-butene | 96.55% | 0.654 | 0.124 | 94.34% | 0.289 | 0.111 |
| 3-Methylheptane | 5.17% | 0.519 | 0.219 | 1.89% | 0.683 | 0.366 |
| 3-Methylhexane | 6.90% | 2.207 | 0.843 | 1.89% | 1.932 | 0.991 |
| 3-Methylpentane | 0.00% | 5.222 | 1.755 | 0.00% | 3.384 | 1.669 |
| 4-Methyl-1-pentene | 93.10% | 0.067 | 0.064 | 90.57% | 0.084 | 0.075 |
| cis-2-Hexene | 100.00% | N/A | n/a | 100.00% | N/A | n/a |
| cis-2-Pentene | 84.48% | 0.201 | 0.091 | 50.94% | 0.345 | 0.103 |
| Cyclopentane | 1.72% | 1.188 | 0.507 | 3.77% | 0.809 | 0.420 |
| Cyclopentene | 96.55% | 0.128 | 0.127 | 90.57% | 0.225 | 0.114 |
| Isopentane | 32.76% | 24.610 | 8.444 | 33.96% | 23.960 | 7.895 |
| Isoprene | 51.72% | 1.243 | 0.274 | 43.40% | 1.772 | 0.294 |
| Methylcyclopentane | 0.00% | 4.825 | 1.693 | 0.00% | 3.666 | 1.737 |
| n-Heptane | 0.00% | 4.332 | 1.588 | 0.00% | 3.454 | 1.638 |
| n-Octane | 0.00% | 11.570 | 3.805 | 0.00% | 2.313 | 1.116 |
| trans-2-Hexene | 100.00% | N/A | n/a | 94.34% | 0.059 | 0.058 |
| trans-2-Pentene | 58.62% | 0.305 | 0.082 | 20.75% | 0.648 | 0.151 |
| Sum of Aliphatic C5-C8 Fraction | NA | 77.306 | 27.007 | NA | 60.548 | 24.507 |

NA = Not Applicable

Table E2. Continued

2012 Total Petroleum Hydrocarbons with Toxicity Values at the Bell and Battlement Mesa Sites in the Rural Oil & Gas Development Area.

| Compound | BELL | | | BATTLEMENT MESA | | |
|---|--------------|-------------------------------------|------------------------------|-----------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Aliphatic hydrocarbons C9-C18 | | | | | | |
| 1-Decene | 100.00% | NA | NA | 100.00% | NA | NA |
| 1-Dodecene | 91.38% | 0.268 | 0.194 | 81.13% | 0.843 | 0.193 |
| 1-Nonene | 68.97% | 0.265 | 0.101 | 81.13% | 0.120 | 0.087 |
| 1-Tridecene | 100.00% | NA | | 100.00% | N/A | n/a |
| 1-Undecene | 93.10% | 0.197 | 0.091 | 98.11% | 0.062 | n/a |
| a-Pinene | 77.59% | 0.330 | 0.114 | 86.79% | 0.168 | 0.118 |
| b-Pinene | 63.79% | 2.218 | 0.258 | 62.26% | 1.293 | 0.280 |
| n-Decane | 5.17% | 0.663 | 0.219 | 0.00% | 0.716 | 0.363 |
| n-Dodecane | 34.48% | 0.312 | 0.133 | 7.55% | 0.331 | 0.154 |
| n-Undecane | 25.86% | 0.277 | 0.119 | 3.77% | 0.436 | 0.197 |
| n-Tridecane | 91.38% | 0.169 | 0.115 | 75.47% | 0.095 | 0.073 |
| Sum of Aliphatic C9-C18 Fraction | NA | 4.699 | 1.344 | NA | 4.064 | 1.465 |
| Aromatic Hydrocarbons C9-C16 | | | | | | |
| p-Diethylbenzene | 82.76% | 0.114 | 0.063 | 86.79% | 0.132 | 0.074 |
| m-Diethylbenzene | 67.24% | 0.670 | 0.116 | 58.49% | 0.548 | 0.135 |
| p-Ethyltoluene | 31.03% | 0.468 | 0.139 | 13.21% | 0.538 | 0.232 |
| m-Ethyltoluene | 24.14% | 0.759 | 0.195 | 3.77% | 0.847 | 0.379 |
| o-Ethyltoluene | 62.07% | 0.293 | 0.085 | 26.42% | 0.282 | 0.128 |
| Sum of Aromatic C9-C16 Fraction | NA | 2.304 | 0.598 | NA | 2.347 | 0.948 |

NA = Not Applicable

Table E 2.1. 2012 Total Petroleum Hydrocarbons with toxicity values at the Parachute and Rifle Sites in the Urban Oil & Gas Development Area

| Compound | PARACHUTE | | | RIFLE | | |
|--|--------------|-------------------------------------|------------------------------|--------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Aliphatic hydrocarbons C5-C8 | | | | | | |
| 1-Heptene | 33.33% | 1.354 | 0.466 | 40.00% | 1.348 | 0.325 |
| 1-Hexene | 71.11% | 0.232 | 0.133 | 65.00% | 0.251 | 0.147 |
| 1-Octene | 44.44% | 0.351 | 0.177 | 43.33% | 0.344 | 0.129 |
| 1-Pentene | 15.56% | 0.423 | 0.181 | 1.67% | 0.523 | 0.279 |
| 2,2,3-Trimethylpentane | 75.56% | 0.179 | 0.122 | 55.00% | 0.221 | 0.119 |
| 2,2,4-Trimethylpentane | 84.44% | 0.584 | 0.095 | 30.00% | 3.206 | 0.346 |
| 2,2-Dimethylbutane | 4.44% | 1.163 | 0.538 | 0.00% | 1.057 | 0.389 |
| 2,3,4-Trimethylpentane | 42.22% | 0.187 | 0.091 | 13.33% | 0.437 | 0.167 |
| 2,3-Dimethylbutane | 26.67% | 1.269 | 0.536 | 20.00% | 1.427 | 0.609 |
| 2,3-Dimethylpentane | 2.22% | 0.890 | 0.444 | 0.00% | 1.054 | 0.400 |
| 2,4-Dimethylpentane | 4.44% | 0.679 | 0.325 | 0.00% | 0.749 | 0.278 |
| 2-Ethyl-1-butene | 97.78% | 2.650 | 2.650 | 100.00% | NA | NA |
| 2-Methyl-1-butene | 53.33% | 0.408 | 0.130 | 15.00% | 0.797 | 0.228 |
| 2-Methyl-1-pentene | 100.00% | NA | NA | 98.33% | 0.045 | 0.045 |
| 2-Methyl-2-butene | 48.89% | 0.526 | 0.163 | 10.00% | 0.998 | 0.278 |
| 2-Methylheptane | 0.00% | 1.530 | 0.655 | 0.00% | 1.226 | 0.376 |
| 2-Methylhexane | 0.00% | 2.763 | 1.249 | 1.67% | 2.857 | 1.363 |
| 2-Methylpentane | 0.00% | 9.105 | 3.987 | 0.00% | 10.280 | 3.513 |
| 3-Methyl-1-butene | 93.33% | 0.267 | 0.104 | 91.67% | 0.446 | 0.130 |
| 3-Methylheptane | 0.00% | 1.180 | 0.523 | 0.00% | 0.870 | 0.294 |
| 3-Methylhexane | 4.44% | 2.717 | 1.111 | 1.67% | 2.898 | 1.008 |
| 3-Methylpentane | 0.00% | 5.140 | 2.179 | 0.00% | 5.551 | 1.860 |
| 4-Methyl-1-pentene | 100.00% | NA | NA | 91.67% | 0.069 | 0.066 |
| cis-2-Hexene | 97.78% | 0.041 | 0.041 | 98.33% | 0.039 | 0.039 |
| cis-2-Pentene | 71.11% | 0.182 | 0.096 | 20.00% | 0.424 | 0.111 |
| Cyclopentane | 0.00% | 1.101 | 0.436 | 0.00% | 1.233 | 0.457 |
| Cyclopentene | 88.89% | 0.702 | 0.147 | 91.67% | 0.239 | 0.117 |
| Isopentane | 37.78% | 23.550 | 8.580 | 38.33% | 31.690 | 9.465 |
| Isoprene | 35.56% | 1.148 | 0.382 | 11.67% | 1.621 | 0.528 |
| Methylcyclopentane | 0.00% | 5.536 | 1.968 | 0.00% | 5.261 | 1.701 |
| n-Heptane | 0.00% | 5.012 | 2.223 | 0.00% | 4.801 | 1.491 |
| n-Octane | 2.22% | 3.913 | 1.389 | 0.00% | 2.610 | 0.846 |
| trans-2-Hexene | 100.00% | NA | NA | 91.67% | 0.097 | 0.078 |
| trans-2-Pentene | 37.78% | 0.345 | 0.123 | 6.67% | 0.797 | 0.216 |
| Sum of Aliphatic C5-C8 Fraction | NA | 75.127 | 31.244 | NA | 85.466 | 27.398 |

NA = Not Applicable

Table E 2.1. Continued

2012 Total Petroleum Hydrocarbons with toxicity values at the Parachute and Rifle Sites in the Urban Oil & Gas Development Area

| Compound | PARACHUTE | | | RIFLE | | |
|---|--------------|-------------------------------------|------------------------------|--------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Aliphatic hydrocarbons C9-C18 | | | | | | |
| 1-Decene | 100.00% | NA | NA | 100.00% | NA | NA |
| 1-Dodecene | 84.44% | 0.660 | 0.169 | 81.67% | 1.744 | 0.189 |
| 1-Nonene | 55.56% | 0.273 | 0.118 | 70.00% | 2.151 | 0.168 |
| 1-Tridecene | 97.78% | 0.091 | 0.091 | 98.33% | 0.102 | 0.102 |
| 1-Undecene | 95.56% | 0.151 | 0.094 | 95.00% | 0.193 | 0.147 |
| a-Pinene | 95.56% | 0.180 | 0.104 | 76.67% | 0.257 | 0.112 |
| b-Pinene | 55.56% | 1.465 | 0.310 | 61.67% | 2.480 | 0.298 |
| n-Decane | 0.00% | 1.368 | 0.497 | 0.00% | 0.757 | 0.305 |
| n-Dodecane | 8.89% | 0.408 | 0.211 | 8.33% | 0.592 | 0.193 |
| n-Undecane | 2.22% | 0.825 | 0.298 | 3.33% | 0.361 | 0.159 |
| n-Tridecane | 57.78% | 0.142 | 0.094 | 81.67% | 0.220 | 0.109 |
| Sum of Aliphatic C9-C18 Fraction | NA | 5.563 | 1.986 | NA | 8.857 | 1.782 |
| Aromatic Hydrocarbons C9-C16 | | | | | | |
| p-Diethylbenzene | 86.67% | 0.236 | 0.075 | 85.00% | 0.132 | 0.076 |
| m-Diethylbenzene | 64.44% | 3.184 | 0.308 | 66.67% | 3.771 | 0.380 |
| p-Ethyltoluene | 17.78% | 0.754 | 0.224 | 5.00% | 0.634 | 0.269 |
| m-Ethyltoluene | 6.67% | 1.234 | 0.423 | 0.00% | 1.103 | 0.407 |
| o-Ethyltoluene | 44.44% | 0.284 | 0.120 | 31.67% | 0.282 | 0.136 |
| Sum of Aromatic C9-C16 Fraction | NA | 5.692 | 1.150 | NA | 5.922 | 1.268 |

NA = Not Applicable

Table E3. 2012 Chemicals with no toxicity values at the Bell and Battlement Mesa Sites in the Rural Oil & Gas Development Area

| Compound | BELL | | | BATTLEMENT MESA | | |
|--------------------------|--------------|-------------------------------------|------------------------------|-----------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Acetylene | 0.00% | 2.742 | 0.602 | 0.00% | 6.922 | 0.725 |
| n-Butane | 1.72% | 37.80 | 13.77 | 0.00% | 24.78 | 10.18 |
| cis-2-Butene | 67.24% | 0.688 | 0.110 | 13.21% | 1.406 | 0.261 |
| trans-2-Butene | 77.59% | 0.763 | 0.104 | 13.21% | 1.560 | 0.288 |
| Ethane | 0.00% | 124.20 | 49.71 | 0.00% | 116.2 | 44.70 |
| Ethylene | 0.00% | 3.993 | 1.290 | 0.00% | 3.063 | 1.305 |
| Isobutane | 0.00% | 33.34 | 12.26 | 0.00% | 23.06 | 8.707 |
| Isobutene/1-Butene | 98.28% | 2.909 | 2.909 | 96.23% | 2.559 | 1.570 |
| Propane | 0.00% | 89.57 | 34.10 | 0.00% | 65.53 | 24.18 |
| Propyne | 100.0% | NA | NA | 100.0% | NA | NA |
| Carbonyls | | | | | | |
| Benzaldehyde | 3.57% | 0.208 | 0.115 | 14.81% | 0.512 | 0.166 |
| Butyraldehyde | 3.57% | 0.118 | 0.070 | 14.81% | 0.130 | 0.077 |
| 2,5-Dimethylbenzaldehyde | 100.0% | NA | NA | 100.0% | NA | NA |
| Hexaldehyde | 3.57% | 0.111 | 0.056 | 14.81% | 0.266 | 0.092 |
| Isovaleraldehyde | 100.0% | NA | NA | 100.0% | NA | NA |
| Tolualdehydes | 25.00% | 0.182 | 0.088 | 29.63% | 0.236 | 0.112 |
| Valeraldehyde | 14.29% | 0.085 | 0.039 | 22.22% | 0.102 | 0.043 |

NA = Not Applicable

Table E3.1. 2012 Chemicals with No Toxicity Values at the Parachute and Rifle Sites in the Urban Oil & Gas Development Area

| Compound | PARACHUTE | | | RIFLE | | |
|--------------------------|--------------|-------------------------------------|------------------------------|--------------|-------------------------------------|------------------------------|
| | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ | % Samples ND | Max. Conc. $\mu\text{g}/\text{m}^3$ | EPC $\mu\text{g}/\text{m}^3$ |
| Acetylene | 0.00% | 1.576 | 0.630 | 0.00% | 3.509 | 1.521 |
| n-Butane | 0.00% | 34.530 | 11.750 | 0.00% | 41.360 | 12.72 |
| cis-2-Butene | 31.11% | 1.228 | 0.185 | 5.00% | 1.451 | 0.356 |
| trans-2-Butene | 28.89% | 1.388 | 0.232 | 5.00% | 1.537 | 0.413 |
| Ethane | 0.00% | 169.70 | 60.580 | 0.00% | 139.00 | 41.25 |
| Ethylene | 0.00% | 7.687 | 2.078 | 0.00% | 7.228 | 2.613 |
| Isobutane | 0.00% | 33.64 | 11.44 | 0.00% | 36.37 | 10.690 |
| Isobutene/1-Butene | 95.56% | 2.995 | 2.602 | 96.67% | 3.155 | 1.947 |
| Propane | 0.00% | 92.58 | 33.01 | 0.00% | 91.98 | 26.64 |
| Propyne | 100.0% | NA | NA | 100.0% | NA | NA |
| Carbonyls | | | | | | |
| Benzaldehyde | 3.70% | 0.174 | 0.081 | 0.00% | 0.243 | 0.131 |
| Butyraldehyde | 7.41% | 0.177 | 0.081 | 10.71% | 0.330 | 0.128 |
| 2,5-Dimethylbenzaldehyde | 100.0% | NA | NA | 100.0% | NA | NA |
| Hexaldehyde | 7.41% | 0.115 | 0.061 | 0.00% | 0.152 | 0.091 |
| Isovaleraldehyde | 100.0% | NA | NA | 96.43% | 0.039 | NA |
| Tolualdehydes | 25.93% | 0.265 | 0.122 | 14.29% | 0.369 | 0.170 |
| Valeraldehyde | 22.22% | 0.120 | 0.043 | 7.14% | 0.201 | 0.075 |

NA = Not Applicable

Table E4. 2012 Summary of EPCs at all monitoring sites.

| Compound | EPC ($\mu\text{g}/\text{m}^3$) | | | |
|----------------------------------|----------------------------------|--------------------|----------|--------|
| | BELL | BATTLEMENT MESA | PARCHUTE | RIFLE |
| Acetaldehyde | 0.712 | 0.643 | 0.817 | 1.203 |
| Acetone | 2.596 | 3.900 | 2.643 | 2.984 |
| Benzene | 0.743 | 1.187 | 1.415 | 1.090 |
| 1,3-Butadiene | 0.126 | 0.130 | 0.113 | 0.211 |
| Crotonaldehyde | 0.236 | 0.085 | 0.089 | 0.135 |
| Cyclohexane | 2.031 | 1.973 | 2.736 | 1.860 |
| Ethylbenzene | 0.099 | 0.210 | 0.184 | 0.288 |
| Formaldehyde | 1.195 | 1.031 | 1.404 | 1.574 |
| n-Hexane | 3.805 | 3.213 | 4.154 | 3.442 |
| Isopropylbenzene | 0.069 | 0.076 | 0.079 | 0.081 |
| Methylcyclohexane | 3.594 | 3.969 | 5.664 | 3.073 |
| Nonane | 0.280 | 0.475 | 0.678 | 0.345 |
| Pentane | 7.096 | 8.128 | 6.266 | 6.786 |
| Propionaldehyde | 0.084 | 0.080 | 0.081 | 0.126 |
| Propylene | 0.427 | 0.492 | 1.078 | 1.100 |
| Propylbenzene | 0.097 | 0.120 | 0.128 | 0.151 |
| Styrene | 1.332 | 2.408 | 2.522 | 1.016 |
| Toluene | 1.582 | 5.207 | 5.254 | 2.402 |
| 1,2,3-Trimethylbenzene | 0.065 | 0.101 | 0.095 | 0.128 |
| 1,2,4-Trimethylbenzene | 0.314 | 0.401 | 0.439 | 0.567 |
| 1,3,5-Trimethylbenzene | 0.097 | 0.171 | 0.203 | 0.178 |
| m-Xylene/p-Xylene | 0.566 | 1.153 | 1.285 | 1.174 |
| o-Xylene | 0.147 | 0.292 | 0.292 | 0.399 |
| Aliphatic hydrocarbons C5-C8 | 27.007 | 24.507 | 31.244 | 27.398 |
| Aliphatic hydrocarbons C9-C18 | 1.344 | 1.465 | 1.986 | 1.782 |
| Aromatic hydrocarbons C9-C16 | 0.598 | 0.948 | 1.150 | 1.268 |

Table E5. 2012 Estimated Potential Lifetime Cancer Risks and Noncancer Hazards (HQ) at the various rural and urban monitoring sites.

| Compound | BELL | | BATTLEMENT MESA | | PARACHUTE | | RIFLE | |
|-------------------------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| | Cancer Risk | HQ | Cancer Risk | HQ | Cancer Risk | HQ | Cancer Risk | HQ |
| Acetaldehyde | 1.57E-06 | 0.08 | 1.41E-06 | 0.07 | 1.80E-06 | 0.09 | 2.65E-06 | 0.13 |
| Acetone | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Benzene | 5.80E-06 | 0.02 | 9.26E-06 | 0.04 | 1.10E-05 | 0.05 | 8.50E-06 | 0.04 |
| 1,3-Butadiene | 3.78E-06 | 0.06 | 3.90E-06 | 0.07 | 3.39E-06 | 0.06 | 6.33E-06 | 0.11 |
| Crotonaldehyde | 1.28E-04 | NA | 4.62E-05 | NA | 4.83E-05 | NA | 7.33E-05 | NC |
| Cyclohexane | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Ethylbenzene | 2.48E-07 | 0.00 | 5.25E-07 | 0.00 | 4.60E-07 | 0.00 | 7.20E-07 | 0.00 |
| Formaldehyde | 1.55E-05 | 0.12 | 1.34E-05 | 0.11 | 1.83E-05 | 0.14 | 2.05E-05 | 0.16 |
| n-Hexane | NC | 0.01 | NC | 0.00 | NC | 0.01 | NC | 0.00 |
| Isopropylbenzene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Methylcyclohexane | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| n-Nonane | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Pentane | NC | 0.01 | NC | 0.01 | NC | 0.01 | NC | 0.01 |
| Propionaldehyde | NC | 0.01 | NC | 0.01 | NC | 0.01 | NC | 0.02 |
| Propylene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| n-propylbenzene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Styrene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Toluene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| 1,2,3-Trimethylbenzene | NC | 0.01 | NC | 0.02 | NC | 0.02 | NC | 0.03 |
| 1,2,4-Trimethylbenzene | NC | 0.04 | NC | 0.06 | NC | 0.06 | NC | 0.08 |
| 1,3,5-Trimethylbenzene | NC | 0.00 | NC | 0.01 | NC | 0.01 | NC | 0.01 |
| m-Xylene/p-Xylene | NC | 0.01 | NC | 0.01 | NC | 0.01 | NC | 0.01 |
| o-Xylene | NC | 0.00 | NC | 0.00 | NC | 0.00 | NC | 0.00 |
| Aliphatic hydrocarbons C5-C8 | 5.13E-06 | 0.05 | 4.66E-06 | 0.04 | 5.94E-06 | 0.05 | 5.21E-06 | 0.05 |
| Aliphatic hydrocarbons C9-C18 | 6.05E-06 | 0.01 | 6.59E-06 | 0.01 | 8.94E-06 | 0.02 | 8.02E-06 | 0.02 |
| Aromatic hydrocarbons C9-C16 | NC | 0.01 | NC | 0.01 | NC | 0.01 | NC | 0.01 |
| Cumulative Risk | 1.66E-04 | 0.45 | 8.59E-05 | 0.48 | 9.81E-05 | 0.56 | 1.25E-04 | 0.68 |

NC = Non-Carcinogen; NA = Not Available