

Global Coal Sales Group, LLC.

Signal Peak Energy - Bull Mountain Mine No.1

Typical Coal Quality Analysis

| Proximate Analysis | As Rec'd | Dry |
|--------------------|----------|--------|
| Moisture % | 19.57 | --- |
| Ash % | 5.81 | 7.23 |
| Volatile Matter % | 30.34 | 37.76 |
| Fixed Carbon %* | 43.84 | 54.47 |
| Sulfur % | 0.44 | 0.54 |
| Btu/Lbs | 10,194 | 12,674 |
| kcal/kg | 5,667 | 7,046 |
| kcal/kg (Net) | 5,349 | 6,792 |
| MAF Btu/Lbs | --- | 13,661 |

| Ash Mineral Analysis % | Ignited | SO ₃ free |
|--------------------------------|---------|----------------------|
| SiO ₂ | 42.09 | 47.20 |
| Al ₂ O ₃ | 26.21 | 29.39 |
| TiO ₂ | 0.99 | 1.11 |
| Fe ₂ O ₃ | 3.60 | 4.04 |
| CaO | 9.28 | 10.41 |
| MgO | 3.02 | 3.39 |
| K ₂ O | 0.50 | 0.56 |
| Na ₂ O | 1.91 | 2.15 |
| P ₂ O ₅ | 0.59 | 0.66 |
| SrO | 0.65 | 0.73 |
| BaO | 0.24 | 0.26 |
| Mn ₃ O ₄ | 0.08 | 0.09 |
| SO ₃ | 10.82 | --- |
| Undetermined | 0 | 0 |

| Sulfur Forms % | As Rec'd | Dry |
|----------------|----------|------|
| Pyritic Sulfur | 0.06 | 0.07 |
| Organic Sulfur | 0.37 | 0.46 |
| Sulfate Sulfur | <0.01 | --- |

| Combustion Products | Lbs/M Btu | Kg/M Btu |
|---------------------|-----------|----------|
| Ash | 5.70 | 2.59 |
| Sulfur | 0.43 | 0.20 |
| SO ₂ | 0.86 | 0.39 |
| H ₂ O** | 63.53 | 28.82 |
| Na ₂ O | 0.11 | 0.05 |
| CO ₂ | 208.96 | 94.78 |

| Ultimate Analysis | As Rec'd | Dry |
|-------------------|----------|-------|
| Moisture % | 19.57 | --- |
| Carbon % | 58.15 | 72.28 |
| Hydrogen % | 3.98 | 4.95 |
| Nitrogen % | 1.02 | 1.27 |
| Sulfur % | 0.44 | 0.54 |
| Ash % | 5.81 | 7.23 |
| Oxygen %* | 11.03 | 13.73 |

| Fusion Temperature (°F) | Reducing | Oxidizing |
|-------------------------|----------|-----------|
| Initial Deformation | 2,362 | 2,429 |
| Softening (H=W) | 2,422 | 2,453 |
| Hemispherical (H=1/2W) | 2,453 | 2,472 |
| Fluid | 2,553 | 2,556 |

| Fusion Temperature (°C) | Reducing | Oxidizing |
|-------------------------|----------|-----------|
| Initial Deformation | 1,294 | 1,332 |
| Softening (H=W) | 1,328 | 1,345 |
| Hemispherical (H=1/2W) | 1,345 | 1,356 |
| Fluid | 1,401 | 1,402 |

| Trace Elements | Dry µg /g |
|----------------|-----------|
| Arsenic | 2.61 |
| Boron | 47.71 |
| Cadmium | 0.05 |
| Chlorine | 21.42 |
| Fluorine | 53.55 |
| Lead | 2.97 |
| Mercury | 0.03 |
| Nickel | 1.90 |
| Phosphorus | 0.02 |
| Selenium | 0.37 |
| Vanadium | 8.08 |
| Zinc | 0 |

| Miscellaneous | |
|------------------------------|------|
| Hardgrove Grindability (HGI) | 49 |
| Fixed Carbon:Volatile ratio* | 1.45 |
| Slagging Index | 0.14 |

* Calculated based on difference

** Assuming Empirical Formula of Coal as C₁₃₇H₉₇O₉NS

Updated as of 2017-11-29